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# Sustainable Food Security as Development Strategy

FAO's sustainable food security and local  
development strategies. Case: The LAMTIB  
Initiative in Southeast Asia.

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Globalization

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## **SUSTAINABLE FOOD SECURITY AS DEVELOPMENT STRATEGY**

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FAO'S SUSTAINABLE FOOD SECURITY AND LOCAL DEVELOPMENT STRATEGIES  
CASE: THE LAMTIB INITIATIVE IN SOUTHEAST ASIA

### **RESEARCH QUESTIONS**

1. HOW CAN THE GLOBAL FOOD SYSTEM CREATE SUSTAINABLE FOOD SECURITY, USING FAO AND UN AS INTERNATIONAL POLICY ACTORS?
2. HOW FOOD SECURITY IS RELEVANT IN DEVELOPMENT, USING THE LAMTIB INITIATIVE IN SOUTHEAST ASIA AS CASE

The purpose with the study is to examine the policy around the global food system and look at how UN and FAO's policies and the LAMTIB Initiative can contribute to sustainable food security and development.



## ACKNOWLEDGEMENT

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My internship in Elkem Chartering in Singapore is the foundation for this study, and my work with the LAMTIB Initiative is used as the case. The internship report, the LAMTIB Initiative's Influence on Development, which I wrote during my stay in Singapore is a building block in my thesis, and is actively referred to as part of the methods and background for information regarding the initiative.

I wish to extend my gratitude to some of the people who helped me with my work on the thesis. First, I would like to thank my supervisor Tom Preststulen, who is managing partner at Elkem Chartering and initiator behind the LAMTIB Initiative. I would also like to thank him for his contribution through constructive feedback, thoughts and valuable life experience during the study. I would also like to thank him for answering my interview questions and his generosity during my stay as intern. He is the mastermind behind this inspiring initiative.

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Trondheim, June 11<sup>th</sup> 2015

Marte Blekastad Forset



## **ABSTRACT**

The United Nations (UN) points out that one of the most crucial and challenging issues facing the world today is food insecurity. Between 2011-13 the UN (2014a) estimated that 842 million people were suffering from chronic hunger, 827 millions of these poor and hungry are living in developing regions. The question about having enough food, is a changing situation, and is rapidly being redefined by new driving forces. The purpose with this study is to examine the policy around the global food system and look at how mainly FAO, UN and the LAMTIB Initiative can contribute to food security and sustainable development. This study are uniting global initiative with local actors, which is argued to be beneficial and improve the results and make it possible to achieve the global development goals.

As several major development approaches not have enable intended results, it is an increasingly demand for a new development approach, a new type with measurable social and environmental friendly impacts. LAMTIB is aiming to empower people to find a sustainable path out of poverty, and enable them to contribute to the world's food security. LAMTIB is used as a case to illustrate a local actor with a new and different approach in a myriad of international policies. LAMTIB illustrates how food security and development goes hand in hand, and how this will create development and sustainable food security. The study is an examination of LAMTIB as an adequate development initiative in a myriad of theories and solutions and reduces poverty while increasing food security.

The study start with an introduction to the topic, followed by research design with a description of methodology applied to answer the research questions. The theoretical framework presents hunger and development theories supplemented by definitions and concepts relevant for an understanding about the topic, to substantiate and form the contexts around the case. The case, LAMTIB, is a new and different development initiative, used to illustrate alternatives to the major meta-theories and initiatives regarding solutions to food security. Analysing and discussing the global food system with a focus on how global and local actor interact, has resulted in an evaluation of LAMTIB as an alternative approach towards food security.

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## LIST OF ACRONYMS

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CSR	Corporate Social Responsibility
FAO	Food and Agriculture Organisation of the United Nations
HIC	Hatchery in Container
ICT	Information and Communication Technologies
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IMF	International Monetary Found
IMTA	Integrated Multi-Trophic Aquaculture
LAMTIB	Leapfrogging Autonomous Micro Technopolis In Boxes
MDG	The Millennium Development Goal
MPI	Multidimensional Poverty Index
NGO	Non Governmental Organisations
NIC	Nursery in Container
NRK	Norsk Rikskringkasting
NTB	Norsk Telegrambyrå
NTNU	Norwegian University of Science and Technology
OECD	Organisation for Economic Co-operation and Development
SDG	Sustainable Development Goal
TNC	Transnational Corporation
UIO	University of Oslo
UN	United Nations
UNECE	United Nations Economic Commission for Europe
UNDP	United Nations Development Programme
USDA	U.S. Department of Agriculture
WBCSD	World Business Council for Sustainable Development
WFP	World Food Programme
WFS	World Food Summit
WHO	World Health Organisation
WTO	World Trade Organisation

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# 1 INTRODUCTION

*Every man, woman and child has the inalienable right to be free from hunger and malnutrition in order to develop fully and maintain their physical and mental faculties (UN 1975:2).*

The United Nations (UN) points out that one of the most crucial and challenging issues facing the world today is food insecurity. Between 2011-13 the UN (2014a) estimated that 842 million people were suffering from chronic hunger, 827 millions of these poor and hungry are living in developing regions, especially in Asia and the Pacific. The question about having enough food, is a changing situation, and is rapidly being redefined by new driving forces. One of the most recognised definition of food security is the one given by the World Food Summit (WFS) in Rome 1996, where *“food security exists when all people, at all time have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life”* (FAO) 2009a:8).

The purpose with the study is to examine the policy around the global food system and look at how UN and FAO as global policy actors and the LAMTIB Initiative as local development strategy can contribute to sustainable food security and development. The research questions that is examined are how can the global food system create sustainable food security and how food security is relevant in development, where LAMTIB illustrates a local development actor interacting with global policy actors such as UN and FAO.

## 1.1 LAMTIB

The LAMTIB Initiative, Leapfrogging Autonomous Micro- Technopolis In Boxes, is an initiative aiming to empower people to find a sustainable path out of poverty, and enable them to contribute to the world’s food security. LAMITIB seeks to empower the underprivileged<sup>1</sup> through sustainable leapfrogging<sup>2</sup> technologies, which means that technological innovation will empower the local people in remote areas to increase their

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<sup>1</sup> Underprivileged people are defined as people *“having less money and fewer opportunities than most people in society”* (Oxford Dictionary 2015). People who do not have the same rights and living standards as the majority of the people in the same society.

<sup>2</sup> LAMTIB understands leapfrogging as a term, often associated with sustainable development in developing countries, meaning for example more advanced clean renewable energy sources in favour of less efficient and more polluting technology (Wuppertal Institute 2006). LAMTIB does also understand leapfrogging in the context of technological innovation within food production, education, health care systems, sanitation, ICT and sanitation as a partly contribution to sustainable development.

livelihoods. LAMTIB is used as a case to illustrate a local actor in a myriad of international policies, and how food security and development goes hand in hand, and how this will create development and sustainable food security in Southeast Asia. LAMTIB is an initiative directed towards at the local rather than the national or international scale to help and create opportunities for underprivileged people to increase their livelihoods through renewable energy, information and communication technologies (ICT), food production, health care, education, clean water and sanitation. With these, remote rural communities will be able to create small-scale businesses that will lead to employment and income opportunities, thus development and food security.

## **1.2 Background**

The greatest challenges today are accessibility and distribution of already available food, together with the challenge of maintaining a sustainable food production in a rapidly changing world with new and increased global challenges. Inequalities are increasing with millions of people who simply do not have the capacity to access the food that is available (Young 2012). With more than 7 billion people living on the same planet and more people increasing their livelihoods, food and water will be scarce resources. Already today, these resources meet heavy challenges such as environmental pollution, urbanisation, climate changes, illegal fishing and hunting. If there is no reversal of these tendencies, there may not be enough (nutritious) food to feed the world in the future.

Ensuring global food security has several positive impacts globally, and it will not only feed more people, it will also increase poor people's everyday life, which will have a positive impact on the society in general. Food security is a major feature in the promotion of peace, stability and prosperity, and it is closely linked to poverty reduction and development. Addressing malnutrition and hunger issues are therefore central goals to improve people's health and well-being (McDonald 2010).

How will it be possible to feed a growing population in the future, with such challenges? Food security as an alternative development strategy is the main area of research in this study. Several scholars argue that poor people with sufficient access to food will increase livelihoods in several ways. To end hunger and increase today's food production, we have to find new solutions to challenges that will occur, and make sure of an equal distribution of the food that is available. The challenges facing agriculture today

and in the future are new and different from what we have experienced earlier, and to solve the sustainability threats, there is a need for new and innovative approaches (Foley et al. 2011). It will be necessary to adopt new species, use unexploited resources and find new sources, a new way that is environmental friendly with lower greenhouse gas emission, biodiversity losses and pollution. Global governance and policies are therefore crucial elements securing the population with sufficient amounts of food to develop “*fully and maintain their physical and mental faculties*” (UN 1975:2).

Freeing everybody from hunger and make sure there is a sustainable food security in the future, are major international challenges that are on top of the list of global responsibilities. To achieve global sustainable food security requires immediate actions. More people die from hunger than malaria, AIDS and tuberculosis combined (WFP 2015a). Hunger will affect all aspects of people’s lives in one way or another. Insufficient access to nutritious food brings a range of problems such as increased maternal death rates, birth defects, blindness and reduced resistance to several diseases (Micronutrient Initiative 2009). The UN points out that “*hunger is the world’s greatest scandal*”, leading to death of a child every six-seconds, as a result of health related problems caused by malnutrition, which under normal health conditions would be treatable (NRK 2010).

*Food insecurity and malnutrition are the result of a complex interplay of factors. Hunger and hidden hunger (micronutrient deficiencies) deprive people of the most valuable sources they own: the energy and skill to work productively. Civil unrest and conflict, natural disasters, extreme weather events and economic crisis complicate efforts to effectively deal with extreme poverty, food insecurity and malnutrition* (FAO, IFAD and WFP 2014:39).

The factors mentioned above will worsen the condition for poor people, as they cannot endure unpredictable incidents in their struggle to find a way to escape poverty.

The global society has several times arranged meetings to establish solutions and concrete targets to improve and save the lives of the fortunate few. 15 years ago UN met and established the Millennium Development Goals (MDGs), which were set up as an initiative to sustain the principles of equality, equity and human dignity and free the world from extreme hunger and poverty. The world has made tremendous progress in the effort of making the world a better place for more people. However, there is still a long way to go. The number of hungry people in developing regions has decreased from 24% in 1990-92 to 14% in 2011-13 (UN 2014a), and the world is moving forward. Although the progress has slowed down in recent years, trends still shows a decrease in the number of poor people. However, the absolute number of poor is rising globally as

the world population is growing rapidly. The inequalities are increasing, both between regions and within countries. Today there are almost 900 million undernourished people in the world. As a contrast, there are at least 1,5 billion people who are overweight in the same world and a large number of these people are also suffering from obesity (Worldometers 2015).<sup>3</sup> The inequalities are enormous, and a future challenge is to decrease this gap by improving access to healthy and nutritious food for a larger share of the population.

The world population is growing rapidly, and in 2011 the number passed 7 billion, and it is estimated to increase further to 9,6 billion by 2050 (UN 2013). Scholars have argued that this might not be sustainable in terms of consumption, carbon footprint and especially, the world food security. How will it be possible to end hunger and poverty in the future, when it is a major problem already today?

### 1.3 Outline of Study

The main research question is to examine the relationship between food security and development, using mainly UN and Food and Agricultural Organisation's (FAO) policy. It will be outlined how hunger and poverty are interdependent factors in a vicious circle, and to achieve development one need not to be hungry. To illustrate local actors initiating at the grassroots, LAMTIB will be used as example, while FAO and the UN will illustrate how global policy makers are making guidelines, goals and solutions to the severe challenge on how to feed the world's population in a changing environment.

*The purpose with the study is to examine the policy around the global food system and look at how global policy actors and local development initiatives can contribute to sustainable food security and development.*

The thesis is divided in three broad parts. The first is introduction and research design, where the research topic and questions are presented with the chosen methodology, where case study, literature research, ethnography and interview are the methods.

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<sup>3</sup> It is important to note that overweight and obesity is not always synonymous with people having access to enormous amounts of food, it can also mean that people have access to unhealthy and nutrient-poor food, due to the fact that unhealthy food, several places, are cheaper and easily accessible for poor people.



The second part consist of a theoretical framework, in which development theories and hunger theories are presented as building blocks, together with relevant concepts and definitions necessary to analyse the research topic. FAO and UN are agencies chosen because they have great influence in setting the agenda, and is considered to be heavyweights in global policy making. Thereafter, comes a presentation of the case, The LAMTIB Initiative. This is a broad and multidimensional initiative, and in the study it will primarily be a focus on the food production module and the initiative as a whole to illustrate how food security is linked to development. LAMTIB will also illustrate a grassroots initiative operating in a world run by global actors.

The last part includes the analysis and discussion, where the case is discussed in relation to theories and concepts introduced. How the global food system can create sustainable food security, using FAO and UN as global agencies to provide guidelines to local actors such as the LAMTIB Initiative in the context of the current situation and the research topic.

Some of the questions examined in the study are: how to achieve sustainable food security, and at the same time create sustainable development? Is it possible to look at development and food security separately? Is it possible to increase people's livelihoods without increasing the global carbon footprint? The examination will be an attempt to give an understanding of a complex topic and possible solutions to the severe dilemma of eliminating food insecurity and its influence on development, which will be presented in the last part, summary and conclusion. The aim is therefore to contribute to a broader understanding, discuss certain elements related to the topic and put it in context of the case.

The study has deliberately excluded some areas that might be relevant in the examination, but due to space, time and resource constraints, it was necessary. For example, the dilemma of water scarcity, food aid, land grabbing and land access, to mention a few, although I am aware that these are factors that will influence global food security. When discussing food security, food safety is an important aspect, but is excluded from the study. Although I am aware that it is an important contribution and influences food (in)security. People who only have access to infected and contaminated food will suffer from illness and disease, which will have an influence on people's ability to move out of poverty. *"Infectious diseases can have significant and widespread impacts*

*on individuals, communities, and societies”* (McDonald 2010:130). World Health Organisation (WHO) reports ill health as the main reason for poverty and why poor people stay poor. *“Infections lead to poverty and poverty leads to infections”* (WHO 2002:12).

I am also aware that the world is infinitely complex and dynamic, and it is therefore extremely difficult to predict and find solutions to such severe multidimensional challenges, which might lead me into several pitfalls. However, to avoid false causation is it important to look at all elements contributing to food security and development.

Southeast Asia<sup>4</sup> is pointed out as the main region of study, due to LAMTIB’s location in Singapore, and proximity to the region. Southeast Asia is a region with vast amounts of unused natural resources, especially marine areas, as well as human resources, as the region is expected to grow rapidly in the future. In the study, Southeast Asia is only emphasised as a region where LAMTIB potentially will make a positive impact regarding development, food security and poverty reduction. The individual differences between the countries of Southeast Asia are significant in a development perspective, and may illustrate the importance of a local approach regarding development. Regional descriptions are important, however, it is necessary to have a local foundation.

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<sup>4</sup> See Appendix D: Map Southeast Asia.

## 2 RESEACH DESIGN AND METHODS

Kitchin and Tate (2000) define research as a process of discovery and investigation, and the aim is to get a better understanding about the relationship between space, place, people and the environment. In this study of food security as a development strategy it is suitable to use a qualitative approach with case study as the methodology. Interview, literature search and ethnography is used as the methods for data collection, as the aim is to get in-depth information, the informants' reflections and maybe also personal thoughts around the topic discussed in the research. Using quantitative analysis, you search for empiric materials that can tell us something about a phenomenon's existence, and is very often used if the research is intended to generalise, which this study is not. An analysis with fewer respondents using qualitative methods is very well suited if one wants an insight in someone's valuations, thoughts, reflections and attitudes (Thagaard 2003), which is the purpose in this study.

The aim of the study is to contribute to an understanding of the research topic through the following research questions:

*Sustainable Food Security as Development Strategy.  
FAO's sustainable food security and local development strategies. Case: The  
LAMTIB Initiative in Southeast Asia.*

1. *How can the global food system create sustainable food security?*
2. *How food security is relevant in a development perspective.*

The research questions are extremely complex, and giving a simple right answer will therefore be impossible. The aim is rather to discuss and look at selected aspects of the topic and put it into context of the case study.

### 2.1 Methodology

Doing social research brings a range of questions, including how the research should be conducted, and an especial important issue is whether, in the context of global food security and development, the social world can be examined according to the same procedures and principles as natural science (Bryman 2012). In the examination of food security and development, the study follows the principles of constructivism, an ontological position, which emphasises that social phenomena are a result of the action of social actors, and are in constant state of change, and tendencies of a deductive

approach are applied, meaning that theory is the outcome of research questions conducted out from existing theory. Existing theories and concepts are used as base for the research questions. The findings are used to revise the existing theory, and how it may be improved to fit better into people's everyday social settings using the LAMTIB Initiative as case.

### 2.1.1 Ethics

In a research process, it is important to follow the ethical directions, and act according to what is right and what is wrong. This requires what Hay (2012:36) refers to as *"sensitivity to the expectations of people from diverse moral communities and acknowledgement of the webs of physical and social relationships within which work is conducted"*. The ethical principles to follow are very much dependent on the choice of methods, however, behaving ethically is crucial because it protects the rights to the people, environment and the community included in the research (Hay 2012). Trust is also important, and correct ethical behaviour will create trust to the public, and gives credibility to the research and the reproduction of findings.

## 2.2 Methods

Methods applied in the study of food security and development, are literature search, ethnography/ participant observations and interview. Before collecting the data, it was conducted an extensive literature review. Reading the literature is crucial to improve the understanding of both the topic and the discipline. A proper literature review will give new and different ideas about what to write about and what is already known. It is at this point one finds out the research topic and questions to answer. Doing an extensive literature review, one finds out what theories and concept have been applied, and who the key contributors are. It also legitimates arguments in the thesis as secondary sources (Healey and Healey 2012, Valentine 2001). *"It is crucial that you know what is known, so that you cannot be accused of not doing your homework and therefor of naively going over old ground"* (Bryman 2012:8). When one has a good overview over existing literature and research projects, you will be able to link it to your own study

(research questions, findings and discussion), which will be useful and important demonstration of the credibility of the research (further discussed in paragraph 5.4).

The analysis is conducted with the prospect of examining the relationship between food (in)security and poverty, as well as study how to unite global policymakers with LAMTIB, a bottom-up development initiative working on the grassroots, fulfilling global initiatives goals and targets to end hunger and poverty. It is an examination of LAMTIB as an adequate development initiative.

### 2.2.1 Literature Search

Paul White (2012) describes secondary data as data already collected for a different purpose. This is a good way to do research if time and money is limited resources. However, this is data one should handle with care, as this is data that is easy to misuse. Therefore, it is important to remember as a researcher, *“that the information has been collected by someone else, for another purpose”* (White 2012:62). White (2012:62), and may not be quite trustworthy. In the literature list, they are referred to with a reference to the author and source where collected.

BIBSYS is applied as the main research engine, with supplements of JSTOR, SCOPUS and Google Scholar (Google scholar is not quality controlled, and is therefore used at a minimum). The main literature used in this study has been found using different keywords such as “food (in)security”, “poverty”, “food policy”, “FAO”, “WTO”, “development” and “food systems”. As an example: food security as key word in BIBSYS gives the book *“Food Security”* (McDonald 2010) as the first result.

Webpages such as fao.org, un.org, worldbank.org, undp.org and ifpri.org etc. are applied actively to find information about the topic. Especially FAO’s papers: *“The State of Food Insecurity in The World”* (2006, 2009, 2013, 2014, 2015), *World Agriculture “Towards 2015/2030”* (2003) and *“FAO’s Strategic Objective’s”* are important sources of theory and background information in the conduction of the study. The UN’s *“Millennium Development Report”* (2014) and International Food Policy Research Institute’s (IFPRI’s) report *“Sustainable Food Security for All by 2020”* (2002) are to be considered as main literature together with *“Agriculture for Development”* by the World Bank, and books such as *“Food and Development”* (Yong 2012); and *“One Billion Hungry. Can We Feed the World?”* (Conway 2012).

Because food security and development are in rapid changes, as the global situation is dynamic, it has been applied as new literature as possible, with certain exceptions on background information, theory and concepts, unless these have changed drastically the last few years. The question about food security and how to create development are in constant change, and the predictions and challenges to achieve food security today and in the future are not the same as they were only 15 years ago.

The style of reference used in the thesis, is based on *Norsk Geografisk Tidsskrift's*. Because *Norsk Geografisk Tidsskrift* does not want online sources referred to in the text or in the literature list, only in footnotes, I have extended this template and include some elements from the Harvard template.

### **2.2.2 Ethnography / Participant Observation**

*“Participant observer/ ethnographer immerses him- or herself in a group for an extended period of time, observing behaviour, listening to what is said in conversations, both between others and with the fieldworker, and asking questions”* (Bryman 2012:432). As an intern in Elkem Chartering in Singapore 2014, working full time with the LAMTIB Initiative, have given me extended information and data about the project, the goals and visions, as well as provided me with direct insight in subjects regarding food security and development. This made me an active participant, where I was included in all processes of the project. This experience is actively being used as a part of the method for data collection.

From the internship there are mainly two reports that are used as information and sources for my data in the study of food security and development in Southeast Asia, the internship report (Forset 2014) and a LAMTIB report (LAMTIB 2015). Tom Preststulen, who was the key informant and the founder of LAMTIB, provided me with extended information about the project, and the situation in Southeast Asia. Close to all information collected about LAMTIB is collected internally, during the internship in Singapore. I did only get the chance to observe the initiative from an organisational perspective, and not how the project might influence and affect development in the

receiving villages and people, as the initiative is still in the start phase, and has not been implemented in the field to its full extent.<sup>5</sup>

### 2.2.3 Interview

In a qualitative interview the approach tend to be less structured, there is a greater attention to the interviewee's point of view and the researcher seeks comprehensive and in-depth answers (Bryman 2012). In this study an interview with Tom Preststulen has been conducted with the purpose of receiving extended information about LAMTIB, and its role as a development agent in Southeast Asia. Preststulen is the mastermind and initiator behind the LAMTIB Initiative, and has more than 40 years of experience with rural Africa, South America and Southeast Asia.

The interview was conducted through email due to time difference and distance, as Preststulen is located in Singapore.<sup>6</sup> One interview with 6 questions was sent, and was answered very thoroughly and has been a great supplement as source of information in the study. A follow-up interview was sent a few days later including two questions, which were as thoroughly answered. The advantage with an email interview is that the respondent may answer the questions whenever convenient. However, one should be critical to an email interview as the respondent might misunderstand or misinterpret the questions and therefore the interviewer might lose valuable data. A face-to-face interview would be preferred, as it is easier to ask follow-up questions, correct misunderstandings, sense facial expressions and body language, which is an important part of the interview process. It is more difficult to earn the respondents trust through an email interview, but in this case that was not an issue, as I know Preststulen from my internship in Singapore.

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<sup>5</sup> There is one energy and ICT container based in Bantayan, Philippines, as emergency relief after the typhoon in 2013, however, it is not up and running to its full extent. The HIC is in a laboratory stadium, and the modules are to be implemented in the container as soon as possible, and the first container is planned to be shipped to Philippines within 2015.

<sup>6</sup> See Appendix A: Interview subscription.





### 3 THEORETICAL FRAMWORK

In analysing the research questions, *how can the global food system create sustainable food security, and how food security is relevant in a development perspective*, we need to get an overview of historical background, the current situation and goals and guidelines for the future. There are several theories and concepts trying to explain development and food (in)security, and some more relevant than others. Selected development theories and hunger theories are chosen as building blocks in the analysis, together with the concepts globalisation, development, food security, food insecurity and poverty, to describe, explain and discuss the relationship between food security and development.

Globalisation is the major driving force behind the changes that have occurred the last centuries, and is often characterised as the beginning of the modern world (Findlay and O'Rourke 2007). Globalisation is a broad and multidimensional concept that can be understood and interpreted in many ways. Goldin and Reinert (2012:2) understand globalisation as *"increase in the impact on human activities of forces that span national boundaries. These activities can be economical, social, cultural, political, technological"*. Globalisation is considered to be a new way of thinking about development, and if globalisation will bring greater equality or intensifies the inequality in the world (Chant and McIlwaine 2009).

#### 3.1 Development Theory

Discussing food security in a development perspective requires a definition of development. *"Development means different things to different people in different places"* (Chant and McIlwaine 2009:6), and to me development represent an improvement of people's everyday lives. An improvement to something better than the current situation, either it is technological, social, cultural political and/or economic. By this, development means, *"changing the world to the better"* (Peet and Hartwick 2009:2), and is often changes that start at the bottom rather than the top of the bureaucracy. When development is used as a term in the study, the main approach is *poverty reduction and increasing poor people's livelihoods*. A livelihood is an important concept and needs to be defined in a proper way in the context of the research topic, and Chambers and Conway's (1992:7-8) understanding is suitable

*the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities which contributes net benefits to other livelihoods at the local and global level and in the short and long term.*

Development theories are sets of propositions that are applied in the explanation of how development has taken place in the past and in the explanation of how to create development in the future. According to Chant and McIlwaine (2009), there is not just one single definition of development, and there is not just one theory trying to explain it. Development theory is a suggestion of what development should imply. Historically there have been several different theories trying to create and explain development. The two main meta- theories explaining the world are *modernisation-* and *dependency-theory*. The former is a theory that believes development is an irreversible and positive process that eventually all societies will pass through. The intellectual roots lies in the nineteenth century sociologists such as Max Weber and Emile Durkheim, who both drew on Darwin's evolution theory in their explanation of the transition of societies from 'traditional' to 'modern' economies. The latter grew forward as a critique to the modernisation theory and the fact that Europe was used as a model on how to create development in developing countries. The dependency theory argues that the widespread poverty in developing countries is a result of an exploitative attitude among industrialised countries. Scholars, such as Andre Günder Frank and Paul Baran, who supports the *dependistas*, argue that the growth of Europe and other developed countries was only possible because of active underdevelopment of developing countries through active exploitation. Today's developing countries have a different starting point for creating development than developed countries had (Chant and McIlwaine 2009).

In the 1980s the *neoliberal approach* quickly became the most accepted approach towards development. The major institutions such the World Bank, the International Monetary Fund (IMF) and World Trade Organisation (WTO), all institutions with severe power in shaping the world, adopted the neoliberalism in one way or another. The principle of neoliberalism is deregulation of markets, comparative advantage and the promotion of free trade, which some would argue is partly the reason why the gap between developed and developing countries have become this large, due to the unequal power relationship (Chant and McIlwaine 2009). As a reaction to the neoliberalism, the

*post-development strategy* grew forward, a critique to the standards assumptions about development and progress. This approach sees the perspective of developing regions, and argues against the modernisation idea, supports a pro-poor growth, focusing on development from below and is approaching development on a more individualistic way, where the different countries' needs are set first and it is not used a universal development strategy. This is a very recognised approach today in the development debate, and has in a larger extent been adopted by the major global policy actors.

### 3.1.1 Poverty

There are many dimensions and understandings of poverty (it is rarely one-dimensional), and there are numbers of different factors that measures poverty related to its various dimensions, and the most common measures are income, health, working conditions, education and empowerment in form of participation. All the measures can be assessed in absolute or relative terms (Goldin and Reinert 2012). Poverty and poor people are in this paper defined after the Multidimensional Poverty Index (MPI) (UNDP 2014). This is a wider and a more adequate measurement than the World Bank's approach, which is more economic, and often understood as income poverty and exists when people live below the poverty line, estimated to be \$1,25<sup>7</sup> per day (The World Bank 2014). Income is an important indicator and measurement of global poverty, but this is not the only factor. The MPI includes living standards (electricity, flooring, clean water, sanitation, cooking fuel and assets), health (nutrition and child mortality) and education (years of schooling and attendance), all vital measures of poverty. Today the number of poor, according to the MPI, counts about 1.5 billion people (UNDP 2014), and if not action is taken, inequalities between rich and poor will keep increasing rapidly. According to United Nations Development Programme (UNDP) (2007) more than 80% of all people live in countries where income gap is increasing, and where it is an increasing significance between urban and rural areas. Today, the population of urban areas have outnumbered the population in rural areas. Nevertheless, the area with the largest population of poor people is still rural. In 2005, approximately 70% of the close to one billion poor were living on less than \$ 1,25 per day (IFAD 2010). However, this does not mean that urbanization and prosperity are synonyms. It is important to point

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<sup>7</sup> The poverty line estimated to \$1,25 per day is heavily criticised, and is further discussed in paragraph 4.2.4.

out that urban slums are growing extremely fast, and much faster than urban areas in general (Global Issues 2013).

Lack of income and money does have major consequences on people's lives, and may result in sickness and diseases, malnourishment, lack of education and work, which will increase the gap between those who have and those who do not. Regardless, this is not the only side of poverty as already pointed out, for instance, lack of education can be a reality without income poverty, and people might still be poor when they have more than \$1,25 a day, and are still extremely vulnerable to shocks and unpredictable incidents.

### 3.1.2 Global Development Goals

Global institutions and organisations have tried for decades to make sustainable development goals and to make a plan for poverty eradication, development and a catching up for developing regions.<sup>8</sup> UN is one of the major global policy institutions, together with FAO, World Bank and IMF, and is a forum where all countries can discuss and find solutions to world challenges and problems. Hunger and food insecurity are among one of the most crucial topics discussed and everybody have their own solutions and thoughts about how this should be solved. The global community have tried several times to act together against severe global challenges, and fifteen years ago, *"the Millennium Declaration articulated a bold vision and established concrete targets for improving the existence of many and for saving the lives of those threatened by disease and hunger"* (UN 2014a:4). There have been significant and important improvements across all goals, with some targets already achieved well ahead the 2015 deadline. The results of the MDGs show how concrete efforts and a collaboration from national governments, global community, civil society and private corporations have contributed to expand opportunities and create hope for people all over the world. But still, it has not been successful to reach all the goals and targets. Hence more needs to be done to accelerate the progress. There is a need for a bolder and more focused action towards the significant disparities and gaps that exists.

Post 2015, UN member states are now discussing and negotiating to define Sustainable Development Goals (SDGs), which will serve as a core development agenda

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<sup>8</sup> See Appendix B and C: MDGs and SDGs.

for the future. The global effort to achieve the MDGs is considered a critical foundation regarding the determination of the global development effort beyond 2015 (UN 2014a). Defining the SDG's have been challenging, due to the several different participants negotiating for their individual needs (access to energy to cover their basic needs), combined with the global threats such as climate changes, and the use of fossil fuels as a crucial energy source (Griggs 2013). The cheapest alternative is not always united with the most environmental friendly alternative, and this is an important factor regarding development and improvements of people's everyday lives. As an example, the oil price has fallen drastically the last year and is now below US\$ 80 per barrel (NTB 2014). This is an important factor for the world energy prices, and will be in great competition to environmentally friendly renewable sources, and especially in developing countries. The creation of global sustainable development goals is extremely challenging, but also important in the long run. Renewable energy sources are highly important for the climate and unpredicted changes can make people's everyday lives more unstable and challenging.

The proposed SDG's are in many ways very similar to the MDGs, and includes several of the same elements, such as sustainable food-, and water security, poverty alleviation, universal clean energy, healthy and productive ecosystems and global governance for sustainable societies (Griggs 2013, UN 2014b). The main difference between MDG's and SDG's are to whom they are directed towards. The MDGs have mainly been directed towards developing regions, whilst the latter are being directed towards all countries, both developing and developed, in an effort to free the humanity from hunger and poverty, and make the world a better place in a new and challenging world with greater threats to overcome (UN 2014b).

In a context of SDG's is it important to define sustainability, which has become something of a "buzz" world. The foundation is a growing concern for the environment, and the fact that humans have an impact on its capabilities. (Tansey and Worsley 1995). In 1987 the Brundtland Commission was first to define sustainable development as *"development which meets the needs of current generations without compromising the ability of future generations to meet their own needs"* (UNECE 2004-5). Griggs (2013:306) have a different definition, a newer definition that reads as follows *"development that meet the needs of the present while safeguarding Earth's life- support system, on which the welfare of current and future generations depends"*. It is important to

meet the needs of the future generation, and to do that one must meet the needs of today and create a sustainable path for the future generations, which is the main purpose with the SDGs. As Pope John Paul II described it, *“the future starts today, not tomorrow”*.<sup>9</sup>

### 3.2 Food Security

Concepts and theories around food security can be applied to all levels of analysis, from individual, households, local, national, regional and global. At the global level food security theory are looking at questions and measures, as to whether the planet can produce sufficient food to feed everybody, including the growing population in the future. Studying food security at the global level is rooted in the fact that it is a prerequisite for food security at all the other levels. A global shortage of food will lead to malnutrition among some groups of people in the world (Brigham 2004).

My study is related to FAO’s numbers on hungry people in the world, although FAO’s approach to calculate hunger has been criticised considerably. Conway (2012:31) points out that this is not very surprising *“given the important role that numbers play in the popular advocacy for more attention to the problems of world hunger”*. FAO’s number of hungry people is far higher than the number presented by other institutions, for example, the U.S. Department of Agriculture (USDA) who uses a similar approach. While FAO (2009b) estimated that it was about 1,020 million people who were undernourished, the USDA’s estimate was only 833 million people (Shapouri et al. 2009). Both institutions are presenting numbers based on people who are expected to be hungry given a certain level of available calories. However, they do not measure the actual hunger or the consequences that comes with hunger. Conway (2012) points out that FAO assumes available calories are a reliable guide to estimate hunger. In their measurement, FAO does not show the variation one finds within individual countries, nor the actual consumption of food. It excludes the fact that a large part of the food consumed in developing regions are produced or captured on a household level and is not traded, resulting in an underestimated consumption among poor people.

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<sup>9</sup> Pope Johannes Paul II.

### 3.2.1 Definition of Food Security

There are countless ways to define hunger and food (in)security. In this study a distinction between the definition of food security and food insecurity have been made, although both are intended to describe the global food situation. However, most people are experiencing food security, but food insecurity is a fact for close to one billion people worldwide. Food insecurity is used when discussing the challenges and issues connected to the topic, and food security as the term when discussing solutions.

The term food security has had different meanings during different times. Originally, the term was used to describe if a country had access to sufficient amount of their dietary energy requirement. Some used the term to describe a country's self-sufficiency, meaning that a country could produce the amount of food needed after the populations demand (Pinstrup-Andersen 2008). Food available from domestic production is key when the economy is developing. Domestic agriculture is still the main provider of food in many developing countries, and is the main sector of employment, and is therefore a crucial source of income in most rural areas (FAO, IFAD and WFP 2014).

Food security at the global or national level tends to focus more on the supply side, and a question often asked, is there sufficient food available? However, availability does not always assure access, and sufficient calories do not always assure a nutritional and healthy diet. The distribution is globally uneven, and was recognised already in the mid 1970s as major challenge to food security (Pinstrup-Andersen 2008). The most recognised definition today, is the declaration from the WFS, FAO in Rome 1996, as mentioned in the introduction:

*food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO 2009a:8).*

FAO's statement identifies the need for nutrient and safe food, at the same time as it changes the concept to include not only access to sufficient food, but access to the food preferred. However, it underscores the methods to achieve this goal (Schanbacher 2010). Pinstrup-Andersen (2008) points out that food security as defined by FAO and WFS, provides a useful goal for the world to strive to achieve, but it is also important to have a clear understanding of the term and what it means for it to be a valuable concept. One has to understand and be aware of the limitations and how this interacts with the behaviour and non-food factors. Food security has several challenges linked to the

global food system in terms of international trade, policy, global governance and development policy. Other factors that might create limitations on world food security are equity, access and ownership, environmental issues and public health (Young 2012).

Food insecurity, as opposite to food security, is a situation that, according to FAO (2015f), “exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life”. The causes for food insecurity can be many and varied. Some examples are lack of purchasing power, unavailable food, inappropriate distribution, inadequate infrastructure etc. This is further analysed and discussed in chapter 4 and 5.

An alternative approach to the major institutions understanding of food security, is food sovereignty, founded by La Via Campesina, or the International Peasant Movement, who have a focus on a local production and local distribution to domestic markets based on a family consumption (Schanbacher 2010). This is a concept that presents a different and challenging approach to the current neoliberal developmental dimension of food security. Food sovereignty is an extreme version of food self-sufficiency, and emerged first in 1996, as a response to the arguments around agriculture in the WTO negotiations, with neoliberalism and globalisation as major factors influencing the international policy (Conway 2012).

*Food sovereignty is the right of each nation to maintain and develop its own capacity and to produce its basic foods respecting cultural and productive diversity. We have the right to produce our own food in our own territory. Food sovereignty is a precondition to genuine food security (Lee 2007:6).*

### **3.2.2 The World Food Summit’s Dimensions of Food Security**

The WFS from 1996, established four dimensions of food security; *access, availability, stability and utilisation* (FAO, IFAD and WFP 2013). The first, *access*, rests on two main pillars, physical and economic. Physical access is including factors such as infrastructure (ports, roads, communication, railways, food storage facilities) and other installations that are crucial to have well-functioning markets. The markets will generate income from forestry, aquaculture and agriculture and plays the primary role when determining the outcome of food security. Economic access is determined by food prices, disposable income, and access to a variety of social support.

The second dimension is *availability*. “Supplying enough food to a given population is a necessary, albeit not a sufficient, condition to ensure that people have adequate access



to food” (FAO, IFAD and WFP 2013:18). Over the last 20 years, food supply has grown faster than the population, resulting in increased food availability per capita. However, as pointed out, availability is not synonymous with access.

The third dimension of food security is *stability* or exposure to short-term risk that may threaten the long- term progress. To measure stability and exposure to risks, there are two main sets of indicators. The first one include irrigation equipment, which is prevention against natural and climatic shocks such as droughts, and also the share of food imports in total merchandise exports. This will capture the adequacy of foreign exchange reserves to pay for their food import. The second group of indicators includes factors that directly affect food security, such as fluctuations in food and input prices, production and supply (FAO, IFAD and WFP 2013).

The fourth and last dimension is *utilisation* and includes two distinct factors. First, using anthropometric indicators that measure how under-nutrition affects children development under the age of five. Second, how effectively food can be put to use through a number of input indicators such as hygiene and health conditions, preparation and food quality (FAO, IFAD and WFP 2013).

There are two main approaches describing hunger and food insecurity, *the availability approach and the entitlement approach*. The former has traditionally emphasised constraints on the production and not sufficient amounts of food available for the population, thus an increasing food production will be the solution to the problem of hunger and food insecurity (Young 2012). The latter approach emphasises more on the unequal distribution of the food available. Today, there is sufficient food available to feed every man, woman and child on the planet, but still, there are close to a billion people who do not have access to the food available (Conway 2012).

*If we were to add up all of the world’s production of food and then divide it equally among the world’s population, each man, woman and child would receive a daily average of over 2800 calories- enough for a healthy lifestyle. But of course, food is not divided in this way (nor income) and it is unrealistic to expect it will happen in the near, or even distant future (Conway 2012:21).*

### **3.2.3 Availability Approach**

Food insecurity and hunger have traditionally been explained in terms of limitations on food production, and the potential imbalance between food production and population

growth (Brigham 2004). There are two main camps within the availability approach trying to explain hunger, *the neo- Malthusian and the technological development approach*. These two camps are closely interlinked, but the former, argues that it will not be more people than it is possible to feed. The latter argues that technological development is the solution to keep the food production in pace with population growth. In the 19<sup>th</sup> century, Europe experienced a rapid population growth, and the solution then, to escape the Malthusian trap,<sup>10</sup> was the industrialisation of agriculture (Findlay and O'Rourke 2007). This was in the 1960s called the Green Revolution, and lead to an increased agricultural output using inorganic fertilizers, synthetic pesticides, irrigation and drainage systems and the investment in agricultural machinery (Conway 2012). Industrial adaptation in farming gave a more rapid food production, and sufficient amounts of food became available to more people, albeit the environmental aspect is lacking.

The neo-Malthusian camp argues that it is not the technological adaptation that is the problem, but the explosive population growth. There are too many people in the world compared to available natural resources, and the production capacity will soon reach its limits. Intensive farming methods and the Green Revolution have already weakened the natural resource base, and they argue the remaining resources are insufficient in feeding a growing population in the future. Their solution is family planning to slow down the population growth (Ehrlich 1969; Brown and Kane 1994; Carson 1962; and Meadows et al 1972 and 1991). This is a view the '*technology optimists*' see as gloomy. They argue there is no need for population control, because the food insecurity in mainly developing countries is a temporary problem. The future holds a close to limitless potential for increased food production, in terms of technological development. It is still unused potential of the Green Revolution, and new developments within biotechnology.

The Green Revolution has enabled food production to grow significantly faster than the population, and has therefore been a crucial solution to end hunger and food insecurity. It was predicted that undernutrition and famines would be exterminated within decades (Geier 1996). To overcome the challenges of food insecurity and hunger, it is necessary to invent new methods and ways of producing food, and find new sources

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<sup>10</sup> The Malthusian trap is a rapid population growth that sooner or later will stop because of insufficient food production (Findlay and O'Rourke 2007).

of food to increase the earth's production capacity (Hoell 1993; Bumb 1995; Dyson 1996).

Despite after several decades with theories, goals and actions trying to establish global food security, people are still waking up hungry day after day in a world with plenty of food. With more than 842 million people suffering from chronic hunger (UN 2014a), producing adequate amounts of food may not be a sufficient solution to end hunger and food insecurity.

### 3.2.4 Entitlement Approach

In the 1980s, a new way of looking at food insecurity and hunger grew forward; the *entitlement approach* fronted by Amartya Sen. This approach focuses more directly on access to food and how this is linked to poverty, and changed the nature and the debate around global hunger and food insecurity (Young 2012). Sen defines starvation as "*the characteristic of some people not having enough food to eat. It is not the characteristic of there not being enough food to eat*" (1981:1). Malnutrition is not about there not being sufficient food, but how people are not able to acquire the food available. It is about distribution and availability (Young 2012).

With the entitlement approach came a new vision about food insecurity in developing countries, a vision that blamed poverty as one of the main causes for hunger and food insecurity. Poverty has never been total absent from the food security debate, but according to Young (2012), Sen took it one step further with his approach. In contrast to the availability approach, which blamed famines on mainly natural disasters to cause harvest failure, the entitlement approach investigates why some people have plenty of food, while others starve. This, Sen (1881) argues, are linked to the distribution of food in the society, where starvation is the result when people cannot access to the food they need.

The availability approach has contributed to the study of hunger and under-nutrition in several ways. One important focus area is the constraints and possibilities regarding food production and supply. However, this approach does suffer from a shortcoming, as it is unable to explain the real question: "*Why do victims suffer from hunger and starvation in spite sufficient overall food availability? And, what can be done to help them?*" (Brigham 2004:26). Young (2012) points out that different processes operates at different scale of analysis, and determines how food is distributed

worldwide, and how entitlements are constructed. Food is in several ways a power factor, and the ability of people to acquire food may reflect economic, social, political, military or inherent positions in all levels of the system. People's ability to acquire food is therefor also related to their access to power.

*Understanding people's entitlements shifts the analytical focus from food production and availability to understanding disruptive mechanisms; that is, what determines how available food is distributed and how politics, economics and ideology influence distribution (Young 2012:21).*

The Entitlement approach might be a valid argument for food insecurity today, but it may not be a valid explanation of future outcomes. There are several factors explaining and trying to understand the severe challenges of feeding every individual on the planet, and to create sufficient access to nutrient and healthy food. The world is endlessly complex and it is hard to predict the right solutions and find guidelines to help improve the current situation, and then, especially, find the right solutions for the future.

### **3.2.5 FAO's Strategic Objectives**

FAO, the Food and Agricultural Organisation of the UN is one of the most influential research and development arms of the UN. They have the last decade pointed out many of the concerns regarding food security, development and poverty alleviation. The main goal when creating FAO, was for the global community to ensure that all people, man, woman and child had all the food needed to live a healthy and active life (McDonald 2010).

FAO have five major strategic objectives in their strive to make the world a better and safer place for as many people as possible. First, "*help eliminate hunger, malnutrition and food insecurity*" (FAO 2015a), meaning they have taken upon the challenge to feed every single person in the world with access to sufficient and healthy food, and most recently at the Rio+20, the UN Secretary General called out to all development partners to accept the "*Zero Hunger Challenge*". To achieve this enormous goal, these promises must be translated into policy and an implementation of necessary resources included.

Second, "*make agriculture, forestry and fisheries more productive and sustainable*" (FAO 2015b), meaning that growth in agricultural sector is one of the most effective ways to create development, achieve food security and reduce poverty. This is a vision that requires a cross sectorial integration in terms of environmental, social and

economic considerations. FAO is focusing on increasing resource efficiency; risk management (ecological, social and economic) associated with production systems, diseases and climate changes; enhancing the role of the ecosystem services (in terms of resource efficiency and risk respond; and facilitating increased access to ICTs. *“Sustainable development is a process, and not a simple defined end-point to be achieved”*. It includes a use of sustainable production strategies such as integrated crop-livestock, crop-aquaculture production and agroforestry systems, that will promote the use of ecosystems services.

Third, *“reduce rural poverty”* (FAO 2015c). Majority of the poor lives in rural areas, therefore, hunger and food insecurity will first of all be harmful to them. Food insecurity is often considered to be an expression of rural poverty. Poverty reduction is crucial in FAO’s mission, to achieve food security for all, and make sure people have sufficient access to nutritious and safe food to live a healthy and active life.

*Bringing more people out of rural poverty is not only an imperative of human dignity and a necessity for sustainable food security; it is also good economics. Successful economic development anywhere, typically has been propelled in its initial stages by fast agricultural productivity growth and broader rural development* (FAO 2015c).

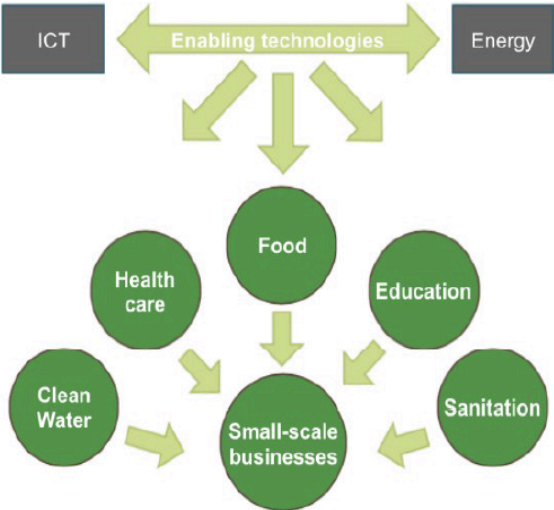
Fourth, *“enable inclusive and efficient agricultural and food systems”* (FAO 2015d). Agriculture has major challenges adjusting to the new globalised world as a part of an integrated value chain that exists of all the elements, from production through processing and to sale. A process that have become extremely challenging and often excluding for small-scale farmers in several developing countries, who do not have the strength and mechanisms to compete and be included in the new globalised market. These are some of the challenges FAO fight against, where they try to integrate and make the global value chain more inclusive by linking small-scale farmers to agribusiness enterprises and supply chains. To achieve this objective, FAO works with both policy makers and private business enterprises that both plays fundamental roles in shaping the markets.

Fifth, and last, *“increase the resilience of livelihoods to threats and crises”* (FAO 2015e). Each year, millions of people are confronted with disasters and crises such as earthquakes, typhoons, droughts and floods. These are crises that most likely will destroy and set back the food production and rural development, as well as have devastating consequences at local, national and global levels. The impacts of disasters

are formed by factors such as age, education, gender, socio-economic status, institutions, and culture, which make the foundation of people’s livelihoods

### 3.3 Case: The LAMTIB Initiative

The LAMTIB Initiative’s mission is designed to *empower underprivileged people through sustainable leapfrogging technologies*, and engage in the effort of eradicating poverty, as well as making an effort to decrease the growing gap in worldwide inequalities. LAMTIB seek to give remote rural communities opportunities to find a sustainable way out of poverty by providing the necessary means, including micro finance support, technology, training and distribution channels. This makes it is possible to create small-scale businesses and help poor people increase their livelihoods (Forset 2014).



**Figure 1: THE ENABLING TECHNOLOGIES:** Energy and ICT lay the foundation for the implementation of the five modules that will enable small-scale businesses.  
Source: Forset 2014, LAMTIB 2015.

LAMTIB consists of seven modules including the two main pillars renewable energy and information and communication technologies (ICT). These two main technologies will connect remote areas with global metropolises, enabling expertise knowledge transfer and remote system control. This will further enable high technological and environmental friendly solutions for food production, health care, education, clean water and sanitation (Figure 1). Connecting rural areas to global

metropolises and the global network, will lead to decentralisation, decreased rural migration, empowerment of the local population and the creation of small scale businesses, which will lead to economic growth and food security through income generating employment.

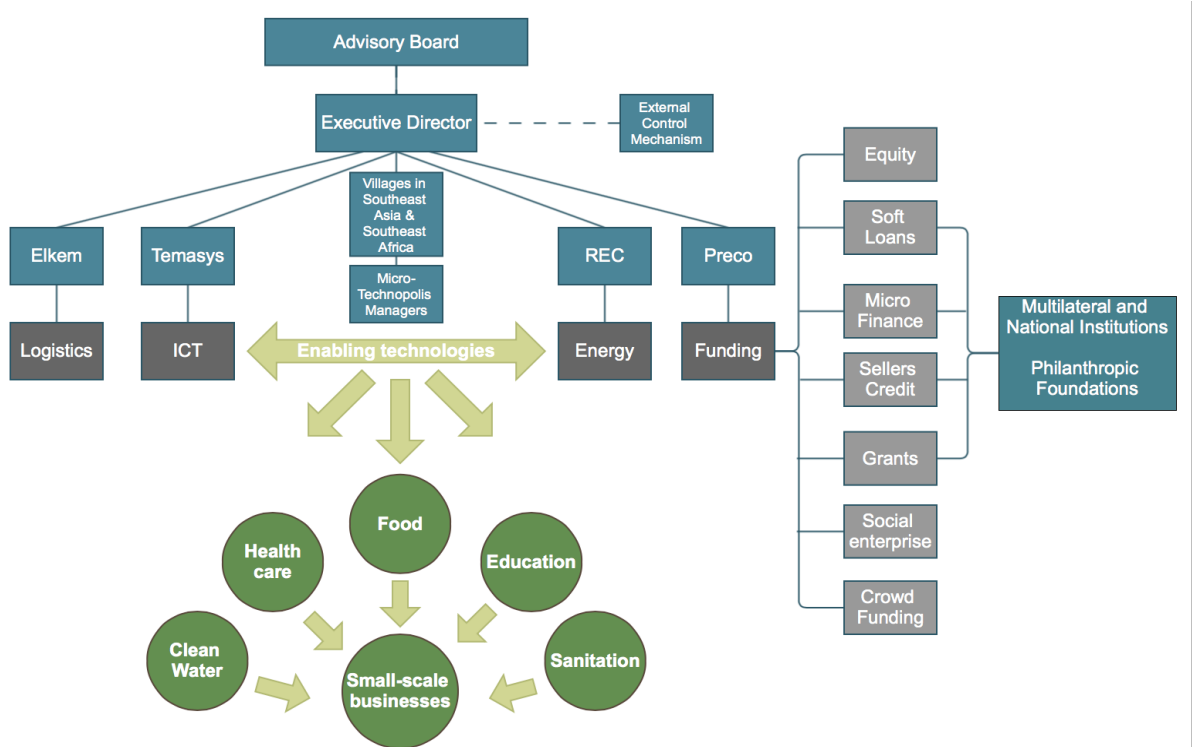
LAMTIB is a multidimensional development strategy that will provide tailor-made solutions specifically based on the needs for each qualified site. Because all communities and villages are different, they all have different needs and different starting point for development. Providing these kind of solutions to remote communities will make it possible to connect with the rest of the world, which may lead to reduced national centralisation whilst empowering people in the community through communication opportunities, education, health care and infrastructure. This may bring positive impact such as income generating employment, and make the community self-sufficient and financial stabile.

The modules are mainly container based, which makes them flexible, but still it is a standardised solution that easily can be adjusted and adapted to site specific needs. Basing the modules in containers makes it robust and climate resistant at the same time as they are easy to transport, even to isolated and secluded areas, and it is cost-effective and interchangeable. Development is an impossible task for one actor, no matter the size. The foundation of LAMTIB is collaboration with world leading actors within their field of operation. Collaboration with experts has the advantage that one can provide the best solutions at all time. This includes institutions, non-governmental organisations (NGOs), organisations, business enterprises and civil society, that have valuable local knowledge about areas LAMTIB see great potential for development.

The “founding fathers” behind this initiative are Elkem Chartering (logistics), Renewable Energy Group (REC), now owned by Elkem (solar energy), Gaia Mariculture (hatchery), Temasys Communication (communication) and Preco AS (Funding), and there are still room for several collaborating partners within the different modules shown in figure 3.3.2. International Centre for Research in Agroforestry, also known as World Agroforestry Centre (ICRAF), to mention one, is included as a partner on the food production module, and will share great expertise regarding nursery and plant schooling.

The organisational structure (Figure 2, below) shows how LAMTIB will manage multiple partners in collaboration. All actors have their own area of responsibilities. The

global challenges occurring in the world present both challenges and opportunities that need a global collaboration across a variety of different sectors, including business enterprises, NGOs, philanthropist organisations and governments. No actor is strong enough to handle such solutions alone. Everyone will therefore benefit and grow stronger when collaborating.



**Figure 2: The Organisational Structure** shows how multiple partners manage to collaborate, with their own area of responsibilities.  
Source: Forset 2014 LAMTIB 2015.

The vision of LAMTIB is different from mainstream development strategies that often are top-down strategies where capacity building and institutional collaboration is the major contribution in development assistance (Riksrevisjonen 2013-14). LAMTIB keeps its focus on the grassroots where a community-based development is believed to be the best solution to make the lives better for the bottom poor.

The aim is to create self-sustained micro-technopolises that can manage to work, to a certain extent, independent from LAMTIB and take responsibility for livelihoods improvements through small-scale businesses. Although, the micro-technopolis will be connected to metropolises and LAMTIB’s collaborating partners through the ICT and energy container for communication, surveillance and support, resulting in a global integration.



## 4 ANALYSIS

How to achieve global food security is an important question threatening the world, and just as a severe dilemma, is the challenges regarding development and making the world a better place.

*The purpose of this study is to examine the relationship between development and food (in)security, and the policy around the current global food system, look at how the global food system can increase global food security, and how global and local development actors are contributing to sustainable food security.*

To examine these questions, I will use the theoretical framework, identify the link between food (in)security and poverty and illustrate with examples from LAMTIB and Southeast Asia. The main focus of the analysis, as mentioned in 2.2, is to find out how LAMTIB can fulfil the global development goals as a development initiative with an atypical approach towards development.

### 4.1 The Global Food System

The world is dynamic and constant fluctuations will influence the global food system in new challenging ways. According to Tansey and Worsley (1995:3-4), these changes are including rapid population growth; an aging population; increased urbanisation resulting in creation of a consumer monoculture; changes in attitudes and values with an emphasis on social and environmental impacts in investments and individual awareness among the citizens; and women entering the labour market are increasing. Globalisation of the world food market, where large transnational corporation's (TNCs), expands their control leading to small-scale farmers being squeezed out of businesses requires innovative action. Technological transfer and development within biotechnology and ICT will be crucial for small-scale farmers to keep up with the changes.

When discussing the global food system it is important to have a clear idea about the term. In this context a food system is a system that

*combines physical activities with economic, social, cultural, and policy factors for the purpose of achieving societal and private goals including improved human health and nutrition. The system is driven by the behavior of a set of actors, including resource owners, farmers, traders, processors, consumers, policymakers, and officials in government and nongovernment organizations, who respond to opportunities, challenges, risks, and constraints imposed by biophysical, socioeconomic, cultural, and policy environments. As such, the global food system is*

*a dynamic behavioral system that can be influenced by public policy through incentives and regulations (Pinstrup- Andersen 2006: 192).*

Several challenges influence the dynamic in the global food system, and in the future the pressure is predicted to increase. World food consumption, in terms of a person kcal every day, is the key variable used to measure and evaluate the current food situation. FAO have estimated that the future food consumption per person will increase, hence it is necessary to find sustainable solutions for a future food production.

*The projections of food demand for the different commodities suggest that the per capita food consumption (Kcal/person/day) will grow significantly. The world average will be approaching 3000 kcal in 2015 and exceeding 3000 kcal in 2030. These changes in the world average will reflect above all rising consumption of the developing countries, whose average will have risen from 2680 kcal in 1997/99 to 2850 kcal in 2015 and close to 3000 kcal in 2030 (FAO 2003:5).*

The demand for agricultural products is predicted to increase by 50% within 2030, due to global population growth, urbanisation and climate changes (FAO 2003). New environmental friendly methods and measures will be necessary to increase the global demand for food. Technological development has proven to feed more people than previously believed (Pinstrup-Andersen and Watson II 2011), and will make it possible to increase production in already existing areas.

Food has become cheaper and perhaps more available over the last few decades, than at any time earlier in history (in real terms). Still it cannot be said that we have a well functioning global food system, when one in seven people today do not have sufficient access to food. On the other side, there are an equal number of people who are over-fed and suffer from obesity (Godfray et al. 2010), and obviously, there is still a way to go before the food system is beneficial for all people.

However, we must look beyond today, as the present food system mostly serves the rich developed countries. About 20% of the global population consumes about 80% of the world's resources. Will such a division sustain, when we need to ensure the basic needs of a rapid growing population? (Tansey and Worsley 1995:2-3). It is necessary to make the food system work for the bottom poor, to be able to secure long-term access to healthy and nutritious food for the bottom poor and hungry, whilst avoiding empowering large corporations to have negative impacts on small excluded actors (Preststulen 2015).

Remote communities are unable to exploit unused natural resources in their areas as they lack the technologies and knowledge about how to do it. LAMTIB is providing technologies, equipment and necessary knowledge about how to take advantage of the resources in their environment. Facilitating infrastructure and practical training will enable remote poor communities to catch up with developing countries and raise their livelihoods, and increase available food to the global market.

Market access is also an important factor to make the food system function for all. Trade barriers *“make it impossible to export into the richer countries. Yet, again is a great unfairness that we started the WTO project because the justification that open markets would be good for the poor. And so, we required them to open their markets to our financial services products and much else but, we have simply not allowed them to import freely to our markets”* (Pogge 2015). This is a destructive situation that targets the poor, as they can take advantage of labour intensive sectors, such as agriculture and textiles, creating development and food security, if they get market access.

#### **4.1.1 Globalisation**

Globalisation is a powerful force in the global economy, a major drive behind the global food system, and has a large impact on the global food security that offers new opportunities. According to the World Bank (2007), increased growth in the global economy entails increased employments that have enabled millions of people to escape poverty. However, globalisation did not only lead to prosperity for the majority of the people. With globalisation came increased inequality, but according to Pinstруп-Andersen and Watson II (2011), Dinello and Squire (2005) finds evidence in their research, that globalisation will eventually result in poverty eradication in most regions and countries. Nevertheless, globalisation may have had larger impacts in countries with higher risks and costs, as they might be fragile and not fitted to receive major changes as fast.

Globalisation is a multidimensional concept that can be interpreted and defined in countless ways, and it may have different meanings among different theorists, as it is dynamic and interact with diverse elements at different time. Due to the complexity, it is difficult to argue whether it has a positive or negative effect on development and the global food situation.

*Globalization influences food systems through changes in governance, capital availability, employment, incomes, relative prices facing producers and consumers, access to dietary diversity, advertisement, labour mobility, women's status, lifestyle, and energy expenditures. These changes in turn impact diet diversity and composition, food safety standards, food quality, human health and nutrition, poverty, food production, the environment, child care and time allocation, and access to knowledge and technology (Pinstrup-Andersen and Watson 2011:279).*

Globalisation and development are two interdependent concepts. Globalisation can either be the reason for development or underdevelopment. LAMTIB sees globalisation as an important gain in development, and seeks to take advantage of the complexity, knowledge and the “strings” connecting the world.

Finding a link between food security and development is not very difficult, and scholars argue that one cannot eradicate poverty without fighting hunger at the same time (Short 2002). Hunger has very deep effects on people's lives, and leads to weak immune systems and make people more exposed to diseases and ill health, which makes them unable to work, and risks expenditures on medical treatment, hence deeper poverty. Hunger brings a range of deeper repercussion, for example children suffering from malnutrition may experience stunting in their development, which only will worsen the situation. As poverty and hunger are closely interconnected, so are the strategies and solutions to eradicate poverty and create food security. The challenge for most of the poor is to earn money and be able to buy food.

*For those who focus their concern on the needs of the hungry, the conclusion is clear: world food supplies are likely to satisfy global demand for at least the next 10 to 20 years. The real challenge, for those of us who focused on the levels of poverty in the world, is to ensure that poor people obtain adequate supplies of this food. We need to be clear that most people buy food rather than produce it. Very few people, including small-scale farmers, are entirely self-sufficient in production. Food insecurity and hunger are related to poverty and an inability to purchase food (Short 2002:149).*

FAO, similar to International Fund for Agriculture and Development (IFAD), demands a broad policy approach that integrates the poor into the global economy, and focuses less on how development theories have contributed to hunger and poverty. LAMTIB as well as FAO and IFAD, have a greater focus on how globalisation may give advantages to the poor and marginalised through implementation of new pro-poor policies. They believe that economic growth, efficiency, profiteering and competition, together with governmental safety nets, are the solution to achieve global food security. Making poor people benefit from globalisation requires knowledge. Small farmers need

assistance learning new agricultural techniques and how to employ more modern technologies to increase agricultural output, as well as know-how about global trends in order to be competitive in the global market (Schanbacher 2010). LAMTIB recognises that many of the technologies and practises required to overcome challenges of sustainability are already available, but new threats such as climate changes and diseases are creating problems previously unconsidered, and requires new innovative solutions and advances in technology to overcome (Watson 2012).

Food has historically been a major driver of globalisation, which has resulted in new routes, improved access to new food sources, and changing diets and societies. Globalisation and new market opportunities presents opportunities for the global food system, such as increased income and alleviating poverty. There are also new kinds of risks that must be addressed in order to sustain the stability in the global food system.

*Globalization reduces domestic price volatility while exposing farmers to global variation in price, trade and finance. There are risks of increased environmental damage as unstable systems of production are favored by short-term competitive pressures, and of increasing inequality within countries as some regions are better able to benefit fro globalization while other stagnate (Pinstrup-Andersen and Watson II 2011:21).*

#### **4.1.2 Sustainable Food Security**

Finding solutions to the challenges of sustainable food security must be done in different ways. Handling the many global threats are a real challenge, and requires a cross-sector and -scale collaboration. FAO points out that obtaining food, rests on two main pillars, economic and physical access. The former is determined by income, food prices and peoples access to social support. The latter is determined by infrastructure such as railway, roads, ports, food storage and functioning markets (FAO, IFAD and WFP 2013). Food insecurity is when people do not have physical nor economic access to food (FAO 2015f). For about one billion people, this is an everyday struggle. Reasons for food insecurity are many and complex, and it is not just an issue about production, and how to increase production capacity. It is also about market access, people's ability to access available food, waste, global threats and policy. To ensure global food security today, and in the future, one need to minimise risks and create opportunities to for poor people to acquire necessary food to *live a healthy and active life*.

There are several measures and solutions to improve people's livelihoods, and give poor people opportunities to find a sustainable path out of poverty. UN, FAO and all

the global development agencies are convinced development through agriculture and the rural sector is key. This is an approach LAMTIB has adopted. More people lives in urban areas than in rural, however, the *majority of poor people* are still living in rural areas, and most of these are directly or indirectly dependent on agriculture for their livelihoods. To achieve the first MDG target, “*eradicate extreme poverty and hunger*” (UN 2014a:8)<sup>11</sup>, a focus on agriculture will play an important role in most rural areas, which will create non-agricultural employment opportunities (Schanbacher 2010).

Policies aimed to increase agricultural productivity and increase availability, especially among small-scale farmers, can create development and are an important factor to alleviate hunger and poverty. In a combination with social security and other measures, that can increase poor families’ income to buy food (FAO, IFAD and WFP 2013). In addition, LAMTIB will provide remote communities with missing infrastructure, after local needs, such as health care, education, electricity, ICT, sanitation, clean water and transportation systems. These are all facilities essential in addition to employment opportunities to find a sustainable path out of poverty. Giving people access to infrastructure will make everyday life easier and food more accessible to more people.

Intensifying agriculture through advancement will be crucial to enable food security, and particularly in the future, where the pressure on resources only will increase together with population growth and increased consumption. However, intensifying the production in an environmental friendly way, as the climate is changing and on some places becoming more extreme. There must be an increased focus on “*developing, protecting and restoring sustainable livelihoods so that the integrity of societies that depend on farming, livestock, fish, forests and other natural resources is not threatened by crises*” (FAO 2015e). This is vital for the global food system to be sustainable and reduce inequalities and poverty.

Reasons and solutions for food insecurity are as many as scholars and theorists. The two main approaches explaining food insecurity, as mentioned, are availability and entitlement approach. Availability approach argues technological innovation and family planning as the solutions. One might say, simple, but not so simple. As mentioned, it is impossible to be more people than food, therefore the question might be reformulated to: how many people do we want to feed? How many people can the planet feed and still

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<sup>11</sup> See Appendix B: MDGs.

be environmentally sustainable? Technological advances have proven to be effective solutions to the dilemma of population growth and famines, as history has shown us the industrial revolution and the green revolution. Although, producing sufficient amounts of food is not the entire solution to food insecurity. People do not have the resources to access the food available, due to lack of employment and income opportunities, but also because they lack crucial infrastructure and well-functioning and access to markets.

One of FAO's strategic objectives is to reduce rural poverty through a diversified rural economy, and strengthening the institutions as well as the management of natural resources. Agriculture is the main sector of employment, but it is necessary to diversify and create non-farm employment opportunities, as countries transform and develop, in addition to social protection programmes (FAO 2015c).

There are several solutions to achieve global and sustainable food security, and the solution is likely to be neither highly industrialised nor organic small-scale farming, but a third possibility that emphasis a incorporation of the environment and technology that results in a sustainable development practice (Pinstrup-Andersen and Watson II 2011). Deployment of new technologies must be directed primarily towards the development of small-scale agriculture, and trade can benefit poor small farmers as long as the government facilitates policies and safety nets in the challenging and often harmful transition integrating into the global food system (Schanbacher 2010).

#### **4.1.3 Threats to Food Security**

Minimizing threats towards food security are essential in order to eliminate hunger and poverty in the future. Maybe the biggest and most severe challenge threatening food security is climate. Today agriculture is responsible for about 30-35% of the global green house gas emissions mostly as a result of tropical deforestation, nitrous oxide emission from inorganic fertilized soil and methane emission from livestock and rice cultivation. This is extremely high, and may contribute to increasing temperature, rising sea level and more frequent extreme weather such as drought, flooding and typhoons (Foley et al. 2011). These are all factors influencing the local, national and global production capacity. About 40-50% of crops today are wasted, either because they are destroyed, or are wasted because of standards and requirements of the products. This accounts for more than 1.3 tons of food every year (FAO 2015g), which could have contributed to feed a growing population and release pressure on recourses and climate.

Due to short-term volatility in supply and future price trends as a result of climate changes, the whole food system may be at risk. However, the potential impacts are unclear, especially at regional scales. But it is likely that changes in climate will increase and affect food insecurity in areas already vulnerable, that are already suffering from hunger and malnutrition (Wheeler and von Braun 2013). Climate changes might result in lower output of production, and consequences such as higher food prices will make food unavailable to more people. Extensive challenges in an already exposed situation, results in more people falling into poverty. Climate changes will indirectly be responsible for food insecurity, and in a position to interrupt the progress towards reaching the two first SDG targets (2014b), *ending poverty in all its forms everywhere, and eventually a world without hunger*.<sup>12</sup> Poor and underdeveloped countries are the countries most vulnerable and least fitted to adapt to these changes. This shows the importance of global cooperation and initiatives directed towards an environmental friendly and sustainable future, and the development of the SDGs.

Agricultural challenges that we experience today are different from anything experienced earlier, and new and innovative approaches are needed (Foley et al. 2011). A world with changing climate, population growth and increased consumption, requires new tactics, thus it is important to find new sources of unused natural resources, adapt new technology, reduce waste, transfer knowledge and develop guidelines to follow. Exploiting unused natural resources in the sea, which holds a great potential as a future food source. Southeast Asia, for instance, has enormous amounts of untapped marine resources, which is elaborated in paragraph 4.1.4.

Hunger reduction and increasing people's livelihoods means increased consumption and transformation to high-value food products, such as meat and dietary products. It requires more energy to produce, and is often less environmentally friendly. This is a challenge that brings up the questions: *can we unite poverty reduction with sustainable development?* The solutions are political and require a cross-sectorial collaboration, with a diversity of voices and approaches towards sustainable development. To achieve sustainable development it is crucial to empower farmers to provide for themselves, their communities and for export markets. This may provide lasting benefits, which makes it is necessary to include them in global conversations, ascertaining their needs, and the solutions to those needs in a sustainable manner. This

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<sup>12</sup> See Appendix C: SDGs.



will be a central element in LAMTIB, to coordinate and include the small and fragile farmers in the global debates and find practical, sustainable solutions to the problems (Preststulen 2015).

Population growth, increased consumption and waste are severe challenge to overcome. Increased consumption and living standards does, unfortunately, also bring increased waste among the consumers, and with more people on the planet increasing their consumption, waste will only become a more extensive issue. Wasted food in one way or another is potential food for an increasing population, and decreasing waste will be environmental friendly and contribute to sustainable food security.

*Increasing population and consumption are placing unpredicted demands on agriculture and natural recourses. Today, approximately a billion people are chronically malnourished while our agricultural systems are concurrently degrading land, water, biodiversity and climate on a global scale. To meet the world's future food security and sustainability needs, food production must grow substantially while, at the same time, agriculture's environmental footprint must shrink dramatically (Foley et al 2011:377).*

Directing attention towards developing regions and especially Southeast Asia is crucial as it is estimated that 90% of the future population growth will occur there (Srivatsan 2014). Southeast Asia has enormous potential exploiting unused natural resources and aquaculture, and has a great potential to overcome current and future challenges regarding food security in a combination of population growth and climate changes. However good management of natural resources are key.

To decrease the differences in the world and alleviate poverty, many approaches and theories have been developed. The powerful, industrialised countries have always made the rules, and been the main donors in aid and development support. The agricultural sector are most exposed to reforms, and countries that earlier were self-sufficient are now forced to switch to cash rich crops, and more tradable farming, which resulted in a switch from food crops such as maize to cotton for export. This led to a rapid drop in global cotton prices, and nations ended up in famine, which was the case in Sudan (Chant and McIlwaine 2009).

Land usages for non-food commodities are threatening the global food security. Nations might prioritise other agricultural products, such as biofuel or cotton. *"In the developing world, the power of capital and expertise drive international traders and operators to source marine and dry land resources, leaving often unstable low margins with the rural population, and in many cases, over-exploiting natural resources, also in an*

*unsustainable manner*” (Preststulen 2015). Larger competition for land to produce food will increase the pressure on resources, resulting in increased food prices when less food is available at the global market, and an increased dependency on food import to secure the population sufficient access to food. This illustrates how important a sustainable and environmental friendly food production is in a world where free trade does not exist in its full potential. Increased agricultural productivity will ensure more food available on the global market, and keep the food prices stable and low.

#### 4.1.4 Agriculture and Aquaculture

Historically, agriculture has been the source of development, and is considered the precursor to the industrial revolution in Europe. The extraordinary powers of agriculture as the basis for early growth are well recognised. Agriculture is vastly underused as development strategy in the modern world (World Bank 2007), which can be explained by several factors, among others, rapid population growth, declining farm size and falling soil fertility leading to missed income opportunities and migration. Investments in agriculture will have positive impacts on development, putting agriculture in a unique position as a provider of agricultural services and as a source of income enabling food security for the majority of rural poor people.

As pointed out, most of the poor people are engaged in agriculture, in one way or another. Smedshaug (2008) argues that an agricultural development will most likely benefit most of the poor people in developing countries, and according to Organization for Economic Co-operation and Development (OECD) (2006), calculations implies that an increase in crops of 10% can reduce the number of people living on less than US\$ 1 per day by 6-10%. The World Bank (2007) points out that to use the full potential of agriculture in development it is necessary to make small-scale farming more competitive and sustainable, and diversify income sources towards the labour market and rural non-farm activity. It is necessary to facilitate the transition out of agriculture and find employment in non-agricultural skilled occupation.

*Tree out of four poor people in developing countries live in rural areas – 2.1 billion living on less than \$2 a day and 880 million on less than \$1 a day – and most depend on agriculture for their livelihoods. Given where they are and what they do best, promoting agriculture is imperative for meeting [the MDGs] of halving poverty and hunger by 2015 and continue to reduce poverty and hunger for several decades*

*thereafter. Agriculture alone will not be enough to massively reduce poverty, but it has proven to be uniquely powerful for that task (World Bank 2007:1).*<sup>13</sup>

Directing development and investment towards agriculture will increase poor people's opportunities to find employment and generate income that has a positive effect on the world food security. This will make a tremendous difference in the lives of hundreds of millions of rural poor, and enable them to find a path out of poverty. With the right investments and implementation of the right policies, world agriculture might bring enormous opportunities such as small-scale farming, livestock, employment and entrepreneurship in agriculture (high-value products), and non-farm work will emerge (World Bank 2007).

The world food production, as already pointed out, is an important driver of globalisation, from production to consumption. Because of globalisation and extremely low transportation costs, climate dependent food commodities can be produced where it is most beneficial. Agriculture is included in the global market as a result of a liberal economic development theory, where free trade and the comparative advantage is the foundation, based on a belief that this will be most beneficial for all. In many developing countries agriculture have suffered from the adjustments reforms implemented as a part of liberalisation. However, some managed to use the 1980s liberalisation policy to their advantage. Vietnam is an example, and *"[...] turned from a rice importer to a rice exporter despite the role of this crop as the country's main staple food. This trade-based market expansion in Vietnam supported household incomes because of the widespread participation of small farms in Vietnam's rice sector. Rice exports increased the income of these small farms and, because rice production is labour intensive in Vietnam, increased demand for rural labour"* (Goldin and Reinert 2012:49).<sup>14</sup> This partial market liberalisation, which also was the case in China, resulted in one of the fastest and largest transitions in increasing people's livelihood and helping people out of poverty and hunger that the world has seen (Pinstrup-Andersen and Watson II 2011).<sup>15</sup>

For poor people to take advantage of the global food system, they must be integrated and gain market access. Several small farmers are not able to produce in the

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<sup>13</sup> See Appendix D, E and F: Numbers and illustrations regarding poverty and hunger in Southeast Asia.

<sup>14</sup> It is important to note that the trade liberalisation of Vietnam was not quite traditional, and has employed export quotas, a maximum export allowance, to ensure stable domestic rice prices, which have had a significant impact on the rural poor, who have rice as main source of calories (Goldin and Reinert 2012).

<sup>15</sup> See Appendix E: Poverty Head Count Ratio, Vietnam.

same speed and with the same efficiency as industrialised farmers can do. This will give the industrialised farmers a global benefit, and will be more competitive than the poor farmers in the South, who will lose market access and a sustainable income. The transition to the modern area has led to a greater stability in food sources, obtaining food and distribution, which has been a lasting challenge for states. Food is an important driver in the efforts to find new markets, open new routes and improve access to sources have had tremendous impacts on both societies and people's diets (McDonald 2012).

Industrialised countries have taken great advantage of new and ever increasing technologies that have increased the production capacity to escape the Malthusian trap. With a slowing down of the population growth, which many industrialised countries have experienced the last decades, has resulted in an overproduction of food, where export has been an important solution. Due to the low production costs, developing countries are unable to compete with rich developing countries, resulting in low local agricultural activity and loss of employment opportunities. Giving developing countries access to the same technologies, equipment and knowledge as the industrialised countries, might decrease inequalities between the rich and poor. However, access to land is another crucial issue requesting focus in developing countries. In Southeast Asia large areas of land are controlled and effectively used by TNCs and larger corporation (Preststulen 2015). Therefore, it is more realistic to look for smaller solutions tailor-made for the poor, facilitating training and knowledge transfer that will create opportunities. LAMTIB's mission is to assist in development that creates sustainable and long-term solutions, including training and education, which will make people more fitted to escape poverty, and empower them to improve their livelihoods.

Nursery in Container (NIC) is one of LAMTIB's solutions. A nursery provides a protected environment where plants and seedlings are propagated and grown to usable size. A nursery will provide knowledge and practice about agroforestry and farming; how to increase output and make agriculture and agroforestry beneficial for specific location; and how to practice in an environmental friendly way. This will result in increased crop yields; make quality seedlings available at a lower price to poor small-scale farmers; as well as knowledge about specific species adapted to different environments (Forset 2014).

Some of the largest untapped resources in the world are marine areas located in Southeast Asia. These have great potential to contribute to global food security and

introduce alternative income generating livelihoods opportunities. But because of remoteness, it is often very difficult to reach, due to poor infrastructure and missing logistics. These are major challenges in the development of aquaculture, and must be addressed by developing overall and vertically integrated setups, that are forming a mass in production to achieve a sustainable economic growth. Making these resources available through investments in infrastructure will bring a range of benefits, both locally and globally.

Aquaculture produces 47% of the global fish people consume (Seafish 2015), and by 2030 it is expected to expand to 60% (World Bank 2013). Logistics and infrastructure are important in the contribution of increased utilisation of harvested resources, and the amount of waste will decrease. Facilitating investments in infrastructure will result in economic growth and development in remote rural areas. This will immediately increase the volume and value of the species and improve the quality, at the same time increase local people's livelihoods (Forset 2014). Aquaculture through fish will contribute to national self-sufficiency, both through direct local consumption, but also through global export and trade.

*In general terms, aquaculture can benefit the livelihoods of the poor either through an improved food supply and/or through employment and increased income. However, at present little or no hard statistical information exists concerning the scale and extent of rural or small-scale aquaculture development within most developing countries, nor concerning the direct/indirect impact of these and the more commercial-scale farming activities and assistance projects on food security and poverty alleviation (FAO 2015h).*

LAMTIB also offers Hatchery in Container (HIC) as a crucial technology to secure increased productivity within aquaculture. HIC is a container based micro hatchery, and is designed to contribute to both local and global food security. It is an environmental friendly way of securing the future growth of rural fishing- and farming communities where hatching larvae and supply of juveniles is the most critical phase for securing a sustainable growth. HIC will avoid crucial risks, such as transportation of juveniles (where approximately 10% are wasted), and allow farmers to get direct access to the hatcheries adjusted for their specific needs nearby their sea farm (Forset 2014).

*The container will provide a continuous remote monitoring of parameters of the hatchery through a remote system control that are connected to the communication container and training of local staff. The 24/7 surveillance of parameters will give great benefits including room temperature, water quality measurement system that includes ammonia, nitrite, pH and dissolved oxygen level; spawning detection with high quality video image; and video camera for algae*

*library and the settlement drums. After a completed training period of the local staff, they can manage the everyday support and monitoring (Forset 2014:16, LAMTIB 2015:23).*

By implementing integrated multi tropic aquaculture (IMTA), in combination with HIC, one can produce high-value products, such as abalones and lobsters for the export market, and at the same time develop and increase the natural habitat for fish and other seafood that will increase local food security. This will increase employment opportunities and contribute to both local and global food security. IMTA is a small sustainable eco-system, and

*refers to the farming of different aquaculture species together in a way that allows one species' wastes to be recycled as feed for another. Typically, IMTA systems combine an aquaculture species that requires external feeding [e.g. salmon and other finfish, abalones and lobster] with species capable of deriving nutrients from the wastes of the 'fed' species. By recycling nutrients that would otherwise be wasted, IMTA [offers] the potential of increased economic gains (Canadian Aquaculture 2015).*

#### **4.1.5 Rural development**

Urbanisation is seen as a result of lack of job opportunities in rural areas, and is challenging to secure the global food security. Although Short (2002) points out that we should not assume the solutions is agricultural. Almost all people are dependent on buying the food they need, and are dependent on employment and an income that can cover the necessary expenditures. In rural areas, it is difficult to find employment and an income that is sufficient to survive, which results in migration to urban areas and the larger cities. Increased income in rural agricultural areas might have a positive effect on ending poverty (Bildén 2012).

*Hunger has multiple dimensions and causes from deficiencies in macro- and micro-nutrient, through short- term shocks on food access, to chronic shortages. Causes range from constraints on the supply of food of sufficient quantity and quality and lack of purchasing power to complex interactions of nutrition with sanitation and infectious diseases leading to poor health (Wheeler and von Braun 2013:508).*

Creating small-scale businesses in rural areas will allow more people to secure livelihoods, and not be forced to migrate and find employment opportunities elsewhere. LAMTIB is mainly using existing natural resources in the local community to make products that can be traded either locally or globally. This can be production such as battery doctor (connected to the energy and ICT container), which is environmental friendly as well as cost effective, as batteries gets an extended life period. Food

production will also be an important sector for the creation of employment opportunities locally, as well as a production of different bi-products such as coconut product (coconut- oil, -butter, -water etc.) or different kinds of bamboo products (houses, bridges etc.). The possibilities are several.

LAMTIB directs development towards the bottom poor in the society. Creating businesses where the mission is to give benefits to the community will have an impact, and increase people's livelihoods as well as increase their purchasing power leading to economic growth. It has been argued that one of the most important measures to move people out of poverty is employment. Giving people income opportunities in rural regions may also decrease migration. To overcome poverty in Southeast Asia, it is necessary to overcome rural-urban income gaps, where more than 600 million people living in extreme poverty, and despite heavy urban migration, rural poverty remains dominant (World Bank 2007).<sup>16</sup> Food production and exploitation of natural resources (in a sustainable way) are an important part of this development.

Another challenge is to overcome gender inequalities in rural areas. Gender equality through empowerment of women and girls will present as a core target for social development (Militaru 2014). Acknowledging women as equal in rural development will contribute and/or increase food security. In Cambodia women are responsible for 80% of the food production and half of them are illiterate, but due to their poor working conditions and the little recognition they receive, for their extremely important contribution, they are often put in a worse situation than men. Investing in women and giving them opportunities are crucial and will increase their bargaining power within the home and in the community, but also because women are more likely than men to spend their income on basic needs for the household, such as food and water (Young 2012). This will improve their livelihoods and be important in their escape out of poverty.

LAMTIB's mission is to create opportunities for rural poor to find a way of escaping poverty. Through the seven modules (food production, clean water, health care, education, sanitation, ICT and energy), LAMTIB will enable opportunities for people to improve their lives, if they are motivated to make the change. This will empower people to take action and develop their situation.

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<sup>16</sup> See Appendix D, E and F: Numbers and illustrations regarding poverty and hunger in Southeast Asia.

## 4.2 Global Policy

To ensure increased access to food for more people, both global and local actors must commit to a common framework that ensures extended and complementary goals and targets regarding poverty and hunger. It is the top of the agenda to increase the commitment to all participants on the planet to engage in a collaboration to make the world sustainable for current and future generations. *“Yet the brutal reality is that there is very little in the way of an accepted set of principles or policy spaces to advance this agenda”* (Rosin et al. 2012:46).

Global institutions and organisations are extremely powerful and are considered heavy weights in political decision-making, and have for long had the overall responsibility for politics regarding development and food security. It is an increasing focus that all participants should take responsibility for their actions. To best achieve results a multi-stake collaboration is crucial with a diversity of approaches (Preststule 2015).

FAO and UN are two global institutions that have enormous influence in shaping the politics around the global food system and development approaches. They are making global guidelines and goals that the world must fight together. MDGs and SDGs are the two leading initiative aiming at eradicate global poverty and hunger (UN 2014a,b).

Global initiatives are important in terms of focus and attention to severe challenges that are threatening humanity. *“Think globally, act locally”*,<sup>17</sup> illustrates how important the global community is to the local grassroots in a globalised world. The international community have major responsibilities initiating and including all states in the collaboration. Fighting poverty and hunger is an impossible task to do alone, even for global institutions and initiatives, and the problems must therefore be solved locally rather than globally.

### 4.2.1 Development

A top-down development approach has for long been considered to be the right way to develop, and are often threaded down on poor people. Starting development from the bottom rather than the top will have a larger effect, including less bureaucracy and corruption to overcome. This will give power and knowledge to the underprivileged, to

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<sup>17</sup> René Dubos.



rule their everyday life in the best way possible (Forset 2014). Empowerment will help them take charge over their own livelihoods and make the changes necessary to find a sustainable way out of poverty, which eventually will lead to changes at the top. A bottom-up approach will find specific solutions determined by local people's motivation and specifics of the location. LAMTIB has a strong belief that the community and people must be motivated to increase their livelihoods, and they must feel ownership to the changes that are happening on their own terms. Diversity, context and alternative voices are three important elements in development, and are highlighting this bottom-up growth strategy. It is an attempt to move away from the grand narratives and meta-theories, and seeks a more individualistic and applied approach where all countries are different, and have a different starting point for development.

*Preststulen (2015) argues most of these initiatives are brought forward through many international and national institutions and authorities, by most "top-down" approaches. If systems and behavioral changes to the better can be achieved this way, reaching the underprivileged, then that's great. LAMTIB, as complementary, not competing initiative, is a "bottom-up" approach. When several LAMTIB micro-technopolis can be demonstrated*

LAMTIB recognises a cross-sectorial approach as part of the solution for development, including all types of actors, from the global community to governments, NGOs, business enterprises, civil society and engaged individuals. To make the world sustainable and at the same time increase livelihoods for the bottom poor require new revolutionary approaches, as the pressure on the resources are only increasing, and threatens global food security. The bottom poor are extremely vulnerable to unpredicted incidents and shocks, as they have limited resources to rebuild and get back on their feet. LAMTIB have a major focus on collaboration, where all actors take their share of the responsibility in making the world a better place for as many as possible at all times. LAMTIB is combining different development approaches, with an applied approach towards development. All development theories argue employment and economic growth is the key to development, but the methods are different. LAMTIB emphasise rural development through the creation of small-scale businesses and the implementation of basic modules required to improve access for basic needs. However, development is an enormous task and it impossible to manage alone. Therefore,

*if we are serious about our commitment to end hunger in our lifetimes, then we must build bridges across existing divides – between rich and poor nations, industry and civil society and so on. Out of a diversity of voices will come a diversity of approaches (Verburg 2015).*

The challenges considering development must be solved through collaboration between nations, institutions, business enterprises and the civil society. Nations are no longer the only powerful actor in the world. The growth of TNCs has changed the rules of the game. TNCs have enormous power in the development debate, and can easily create development as underdevelopment and exploitation, which might result in a race to the bottom.<sup>18</sup> This is a situation created by globalisation, and it is a reality when countries are pushed into a position where they have to compete to attract investments, and hold the most favourable conditions as a location. Because of TNC's powerful positions, they are able to push limits in their favour. They should also be considered pioneers in pushing the limits in favour of the environment and social development, as they have both the power and the resources available. More TNCs acknowledges the importance of social responsibility, and are through their corporate social responsibility (CSR) programmes, directing attention towards creating positive social and environmental impact is becoming a focus area. This is one side LAMTIB seek to take advantage of, by attracting business enterprises to take part through their CSR programmes. The aim is to empower underprivileged people in remote communities. TNCs are in some eyes seen as direct consequences of globalisation, and through CSR, businesses can turn their negative impact on environment and/or societies to positive impacts. CSR is defined by the Norwegian Ministry of Foreign Affairs (2008-9:4) as *"what companies do on a voluntary basis beyond complying with existing legislation and rules in the country in which they are operating"*.

Strategies for poverty reduction are through pro-poor growth, and *"more specifically for labour- intensive,<sup>19</sup> food production based growth"* (FAO 2003:218-19). Growth can reduce poverty through increased incomes, however growth may not reach everyone, and in may not lead to better job opportunities, unless the structures and policies are targeting the marginalised in rural areas. In poor developing countries,

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<sup>18</sup> Race to the bottom is a competition between developing countries to have the most favourable conditions for TNCs to attract investments. However, this is, in most cases, not the most favourable conditions for the community and the people, and are leading to marginalisation and negative social impact (Chant and McIlwaine 2009).

<sup>19</sup> Cheap labour (not synonymous with labour intensive, but often interlinked) is one of the most important comparative advantages in several developing countries, but unless used carefully, it is easy to exploit. Increasing people's livelihoods through cheap labour is possible, and Bangladesh is an example. They have been able to reduce poverty through their textile industry, and give employment to more than two million people (Oxfam 2002).

hunger and poverty will only be alleviated with sustainable growth that is broadly shared. Public policies and programmes are essential to achieve hunger reduction, and keeping agriculture and food security on top the development agenda is crucial for reaching the major global targets in alleviating poverty and undernourishment (FAO IFAD and WFP 2013).

#### 4.2.2 Trade

International trade is recognised as a powerful influence on poverty reduction, and through expanding markets, job creation, competition, raising productivity and provision of new technologies, knowledge and global integration. Increased market access and trading opportunities are policies that must be implemented into practice through local grassroots projects, which has the knowledge and means to put it in action. However, it is important to note that the link between poverty alleviation and trade is not automatic, and trade-related capacity building must work together with increased market access for trade to have a positive impact on development (Goldin and Reinert 2012).

Unfortunately, developing countries often meet trade protection and barriers from industrialised and developed countries. There are at least six different hurdles in gaining access to developed countries' markets: subsidies, quota, tariffs, regulations and standards, security checks and rules of origin (Goldin and Reinert 2012). These are all regulations used to protect national producers and products, resulting in unemployment in poor rural areas. Trade barriers from rich industrialised countries are a major threat for poor developing countries and their investment in agriculture. Bilden (2012) argues that developing countries have a great potential for increased agricultural production, and industrialised countries do not have the same potential. Industrialised farming is very energy consuming and intensive, hence compromising animal welfare and environmental sustainability. In developing countries, it is possible to increase the production without increasing to the same level of energy consumption as in industrialised countries, which in most cases do have a colder climate. Developing countries have manual labour force, and can therefore increase their production in an environmental friendly way, at the same time as it creates employment to more people. Access to global markets is crucial to increase agricultural output in developing countries.

Very often do trade encourage and stimulate economic growth, and facilitates the efficient transfer from regions with food surplus to regions with food deficit, which reduces the burden of both short-term fluctuations and long-term structural changes. A policy where countries are self-reliant rather than self-sufficient will increase nations food security, regardless of costs (WTO 2005). The concept of food security has often been misunderstood, and misinterpreted as self-sufficiency, meaning whether a nation, region or city have sufficient production and buffer stocks to feed its population over a given period (Rosin et al. 2012). In more recent international debates, food security has developed and advanced to be more expansive in an area of globalisation, therefore self-sufficiency is no longer comparable to food security. *“The goal of self-sufficiency is illusory in today’s world where a vast range of inputs constitute the full production equation. Nor is any country insulated from sudden adverse climatic effects which can dramatically reduce domestic agricultural output”* (WTO 2005). A point that illustrate how dependent and vulnerable countries are to unpredicted incidents, such as climate changes. Therefore, integrating remote villages to the global market will only benefit all parts if there are new markets opening up, and new recourses made available.

Agriculture is often considered the primary comparative advantage<sup>20</sup> among developing countries. To be able to use an agricultural productivity as a development strategy, one need market access, and institution that can facilitate entrance to the international market and make trade work for the poor (Schanbacher 2010). LAMTIB will facilitate and increase market access for poor people through businesses’ CSR programme, or through a social business model, which is outlined as *“a for-profit enterprise whose primary objectives is nevertheless to achieve social impact rather than generating profit for owners and shareholders. Social business uses market principles, produce goods and services in an innovative way, and typically reinvest any surpluses back to the enterprise to achieve the social mission”* (Credit Suisse 2012: Glossary of terms). Large TNCs are extremely powerful in the global arena shaping the politics but also as social and economic agents. They control vast amounts of resources and they have the capacity to relocate to more profitable locations (Scherer and Palazzo 2008). Requesting a new type of investment where business enterprises plays a leading role in taking part

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<sup>20</sup> Principles of comparative advantage: *“Trade serves all countries best, if every country specialise in production of products and/or services they have (or may get) a comparative advantage”* (Austvik 2002:74, my translation).

of the responsibility through their CSR programmes, but also as social enterprises, will have increasingly important global effects.

LAMTIB is a combination of CSR and social enterprise. A social enterprise is a business *“whose primary purpose is the common good. They use the methods and disciplines of business and the power of the marketplace to advance their social, environmental and human justice agendas”* (Social Enterprise Alliance 2015). This creates a win-win situation for development and business enterprises. The latter have large networks, logistical capabilities and distribution channels they can provide to the former. This is a possibility to include and upscale services and products, and solves the issue regarding market access (Milligan 2012).

Food security is a complex matter, and has several solutions. WTO (2005) points out that increasing food security requires initiatives and policy actions. Trade as one important element among others, will enhance interdependence and integration cross borders where there is autarchy and no protection. The World Bank (2007:11) points out that the estimated welfare impacts of trade liberalisation are relatively large, and by removing protecting trade barriers, *“industrial countries would induce annual welfare gains for developing countries estimated to be five times the current annual flow of aid to agriculture”*. However, full trade liberalisation might also have negative impacts, for instance, it is estimated that global food prices will increase with 5.5 %, which might have negative impacts on development. Poor people will use a larger share of their income on food, which in some cases might be critical for low-income household, which illustrating how important increased production capacity is on the global market. One of the best ways to achieve food security is through a politically interdependent and economically integrated world where smaller initiatives such as LAMTIB work on the grassroots, in an effort to fulfil global initiatives guidelines and policy.

### 4.2.3 Impact Investment

*Impact investing is an exiting area for private investors- it enables them to use their capital, energy and skills to drive a truly positive change in the world, while still protecting and growing their wealth and transferring it to the next generation alongside a better future. No wonder a growing number of wealth holders are becoming attracted to impact investing (Jaquier 2012:37).*

Impact investment is for many a more effective way of creating development than aid and charity. It is investments made with the aim of creating a positive impact in

societies. It provides opportunities for societies to take responsibility of their own development and future. They seek to create self-sufficient and sustainable solutions with long-term perspectives. LAMTIB see this as a door to include private business enterprises in the development debate, where everybody will benefit.

Global policy actors does have the power and mandate to improve this situation, but because the international community is more or less an anarchy run by market and capitalist principles, it is hard to manage this change in practice. Enforcing international regulation and laws, and make them count for both businesses and states are difficult as they are two actors with quite different interests (Forset 2014). It is necessary to find solutions that all part will find beneficial, which require a collaboration between NGOs, civil society, states, business enterprises and international institutions on topic regarding the planet.

CSR have become increasingly important, in pointing out the responsibility of businesses. The Norwegian Ministry of Foreign Affairs (2008-9:3) points out *“a well-functioning private sector is important for welfare and development. Investment and trade are essential for sustainable development in the South. If carried out in a responsible manner”*. To fight poverty it is crucial to create economic revenues, and TNCs are in many ways the best-suited actor to make these investment and participate in a pro-poor growth. Small corporations as well as larger ones, have responsibilities as *“global citizens and local neighbours in a fast-changing world”* (WBCSD 2015). Acting in a responsible manner with an emphasis on the local community, will have an actual effect on the society and bring economic development, resulting in increased livelihoods for the employees and their families.

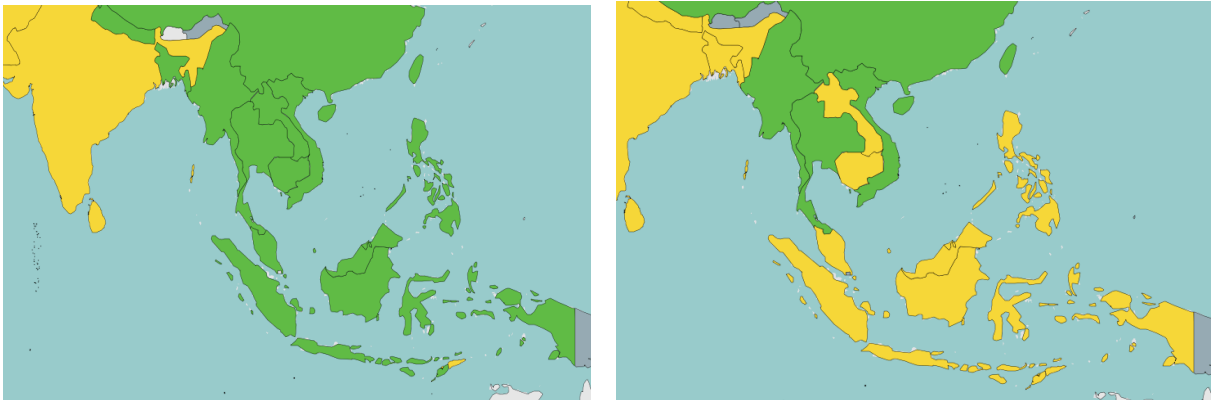
#### **4.2.4 Global Initiatives**

When the MDGs were launched, they were widely celebrated. The international community had now committed to make the world a better place. It is very important to have global initiatives, although it has its upsides and downsides. The experience with the MDGs shows that the international community is able to collaborate and confront difficult and complex issues and challenges, although the result is not as good as anticipated. As a supplement to global development initiatives, there is a need for local initiatives working on the grassroots.

**MDGs**

The MDGs are directed towards concrete situations and have specific goals of improvements, and has shifted away from conservative approaches associated with the grand meta-development theories. The MDGs places people in the centre, and generate possibilities of significant improvements in underprivileged people’s lives (General Assembly 2014). The MDGs are good for advocacy, and provides a basic standard of negotiations with governments and agencies, together with country specific targets.

The benefits by implementing the MDGs are the attention of the urgent situation eradicating poverty and food insecurity (Pogge 2015). Although the goals might look like a great achievement (UN 2014a), it can be argued that they are not very ambitious. In fact, they are less ambitious than the original goals that were launched in Rome during the WFS in 1996. Halving the number of poor and hungry within 2015 is a lower number than the 19% (from 1094-883 million), which is the goal from1996. This, one can argue is censurable and misleading (figure 3, below) (Pogge 2003).



**Figure 3: FAO Hunger Map.** To the left: The MDG measures the progress, by country, towards reaching the first development target,<sup>21</sup> halving the *proportion* of people suffering from hunger (1990- 2015). To the right: WFS target measures the progress, by country, towards halving the *number* of undernourished people in the world (1990-2015). Source: FAO 2015i.

- Target achieved
- Target not achieved, with slow progress
- Target not achieved, with lack of progress or deterioration

*For the year 2000, some 1094 million were reported to be living below \$1/day. Halving the number of extremely poor people thus would commit us to ensuring that there are no more than 547 million such people in 2015. Halving the proportion of extremely poor people is less ambitious. In 2000, the total human population was 6070.6 million [...]; so 18.02 percent were living in extreme poverty.*

<sup>21</sup> See Appendix B: MDGs.

*Halving the proportion means reducing this percentage to 9.01 percent. Given an expected human population of 7197 million in 2015 [...], the implied goal is then to reduce the number of extremely poor people to 648.5 million by 2015. The planned poverty reduction has been shrunk by 101.5 million (Pogge 2003:3).*

Nevertheless, the trend of simplifying the process of development has continued, and believes that development is a linear process and emphasis neo-liberal and capitalists solutions. The goals point out key issues and challenges in development, but as all development approaches, they have been heavily condemned. For instance, it is a growing criticism of the entire conceptualisation, and especially how the different goals are measured. For example, income is not a sufficient measurement of poverty, as pointed out in 3.1.1. The MDGs have been criticised of being monetarily rather than movement driven, because of a wide focus on costs, quantitatively measurable goals and the actively overlooking of the importance of social relations, and instrumental changes are often favoured prior structural changes, which is more difficult to implement. Conditions beyond the donors control are often being ignored, despite the importance to meet the goals (Chant and McIlwaine 2009).

UN has argued they have made tremendous progress reducing the number of poor people. However, measuring poverty, development and well-being is not easy and straight-forward. Because of national and local differences in poverty lines and measurements, the result might not be as reliable as one might wish. The MDG also underestimates the number of poor by dividing countries into regions.<sup>22</sup> There are major individual differences between countries even in the same region, and as the dependency theory argues, all countries have different starting point for development, e.g. *“thanks to China’s success, reported extreme poverty in the entire “East Asia and the Pacific” region has been halved by 1999 already — one year before the Millennium Declaration was even adopted!”* (Pogge 2003:4).

The MDGs are measured by the World Banks poverty line of \$1,25. This is a number than has been criticised of being to low to reflect the actual situation, it is one sided, and does only measure income deprivation, as such, it is not adequate as a development measure. If food and services were equal expenditures, the picture would

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<sup>22</sup> Appendix B, E and F: Illustrates individual differences in improvements and the current situation regarding poverty and hunger in Southeast Asia.



be a little different.<sup>23</sup> Using the MPI you will end up with a much larger number, 1,5 billion people who are considered poor (UNDP 2014). Therefore, the UN and World Banks methods of poverty are questionable, thus alternative approaches and initiatives are necessary a supplement in order to end hunger and poverty.

Another problem connected to the goals are responsibilities. Who are responsible for achieving these targets? *"Everybody was very happy to celebrate the goals: to say, yeah, yeah-that's good. Let's just all reduce poverty. And nobody felt in particular called upon to do anything in particular to achieve the goals"* (Pogge 2015). Goals and theories are not sufficient in the action of fighting poverty. It is crucial to state the responsibilities, and attach the goals to agents and actors. This will make the goals more effective and increase the credibility on a global scale. To benefit from global initiatives there must be a clear structural and workable plan, in which participants have committed to see through. This is a clear example of how grassroots initiatives such as LAMTIB are crucial in collaboration with the big and global. They try to bring global policy down to the local and to a more applied approach, and adjusting global policies, goals and targets to local and individual's specifically needs.

## SDGs

NGOs, civil society, nations and international actors joined behind the goals in a multi-front battle against hunger and poverty. The year 2015 is the deadline for the MDGs, and they are not all achieved. To continue the path in the effort of making the world a better place for the current population, and for the future population, sustainable development have become an increasingly popular term. Sustainable development is highly important due to increasingly irreversible climate changes that will have major consequences on human well-being, security and the global food security.

There are different opinions about the SDGs and whether it is a good solution to the challenges we are facing. We are at a crossroad, and the further direction will determine if we are able to take the first steps towards a sustainable future, if we will succeed or fail in fulfilling our promise, ending poverty and demanding dignity for all (General Assembly 2014). The report does point out that a uniting and integrated

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<sup>23</sup> *"If the World Bank's poverty line were adequate for the US, where food is cheap relative to services, the Bank, by using general- consumption PPPs for converting its IPL into national poverty lines, may still have greatly undercounted the poor in many poor countries where food is more expensive relative to services than in the US"* (Pogge 2003:11).

development agenda is needed, and requires an equally divided framework of means for its implementation (General Assembly 2014). The SDG are trying to fulfil and improve some of the deficiencies from the MDG. They are considered to be more advanced, integrates important critique and suggestions of improvements (Melamed and Scott 2011). The focus of the development goals have changed from being specific targets to becoming more overarching measures to promote people's well-being and equality.

Despite the critique, global development goals are important. The most crucial solution to end poverty and food insecurity is global collaboration where everyone takes responsibility and contributes to global food security and development. Making the world come together and discuss solutions and alternatives to the problem are highly important, however, there should be an increased emphasis on listening to the poor and underprivileged and to their needs. It is crucial to find practical solutions and implement them in motivated villages, in a combination of global agencies facilitates and implements pro-poor growth conditions.

It have been argued that the sustainable development concept has become too complex and comprehensive, thus lost its meaning as a useful guide for policymaking, hence it is in danger of becoming irrelevant (Hopwood et al. 2005, Redclift 2005). But still, there is an increased focus on the concept (Holden et al. 2013). Sustainable development is today a growing concern globally as new treats are challenging humanity.

### **4.3 LAMTIB as a Development Initiative**

Poverty reduction and development is typically associated with rapid economic growth, but economic growth is not a panacea and it is not *"silver bullets or quick fixes"* (FAO 2015c). Rural poverty exists in those places where improving agricultural productivity and infrastructure have been neglected. To be able to eradicate poverty it is crucial with a broader policy approach that seeks to diversify the rural economy at large and make it dynamic. As FAO, LAMTIB provides support and expertise to improve access to infrastructure (in terms of education, market access, equipment, transportation etc.) necessary to create a better situation for the bottom poor.

LAMTIB is a different kind of development initiative, and are aimed at business enterprises, development organisations, NGOs and governments, to do

*business that trades for social and/or environmental purpose. It will have a clear sense of its 'social mission': which mean it will know what difference it is trying to make, who it aims to help, and how it plans to do it. It will bring in most or all of its income through selling goods or services. And it will also have clear rules about what it does with its profits, reinvesting these to further the 'social mission' (Social Enterprise UK 2015).*

With the aim to create income generating opportunities in rural areas by implementing the seven modules of electricity, ICT, clean water, sanitation, education, health care and food production, LAMTIB is considered to be a sustainable alternative in addition to global institutions and organisations who are more traditional in their way of assisting development. These are important organisations in a LAMTIB perspective, and have a solid foundation of experience and knowledge that smaller initiatives should take advantage of. LAMTIB is a broad initiative aiming at fulfilling the needs of several agencies and actors through a more practical approach, by looking at the local needs and qualifications in the specific site.

However, because LAMTIB is still in the start phase, and still need to grow stronger and larger before it will be able to constitute a significant difference, it is now dependent on attention from the more experienced and larger initiative, and must evaluate the needs on the market. The world is in an increasingly extent searching for alternative approaches that must be sustainable and have long-term goals.

The world is changing more rapid than ever before, and to improve the dire situation for about one billion poor people, there is a need for a global collaboration. Organisations, institutions, NGOs, states, business enterprises and the civil society must come together to commit to social and environmental changes that will make the world sustainable for the current and future generation. It is not sufficient with global goals to make improvement on the grassroots. It is important to find solutions to how global overall goals and processes can benefit local communities. Meta-development theories and globalisation have resulted in a marginalisation of local societies, and have many places led to a race to the bottom (Rigg 2007). Bringing the global down to the grassroots is very important to reach the MDG's target (UN 2014a) of eradicating extreme poverty and hunger and the SDG's (UN 2014b), ending poverty and hunger in all its forms everywhere and achieve global food security. Global initiative and policy makers have an important job in creating guidelines and goals for smaller initiatives, such as, LAMTIB to aspire.

Creating employment and income generating opportunities in rural areas are considered to be the most effective way of increasing poor people's livelihoods. Small-scale business that LAMTIB assists will give people different work opportunities only limited by the location and the motivation among the inhabitants. The solution for development is not always agricultural in terms of farming and aquaculture. An alternative can for instance be production of coconut products, such as oil, milk, water etc. This is a resource you can find in many developing countries, and the products are easily exportable to the global market using business enterprises, which let small producers sell their products as a part of their social responsibility.

Globalisation hold a central place in development, and LAMTIB believes one need to take advantages of the elements globalisations brings. LAMTIB seeks to enable rural communities to leapfrog out poverty and jump to the top of the development ladder, using technological innovation with the help from the best actors within the field of operation and connect them to the global market through among other factors, Internet, communication and transportation. LAMTIB illustrates how the global have become the new local (Forset 2014). Technological innovation and distribution is not only crucial in agricultural development, but also within all fields of the society, including health care, education and other small-scale businesses.

LAMTIB seek to meet overall development goals, such as ensuring food security, poverty reduction and increased livelihoods among the bottom poor in the world, in a contribution of reaching the MDGs and SDGs. However, the methods are a little different than the major development agencies prefer. A bottom-up approach will escape the bureaucracy trap one often meet when implementing development projects. Starting at the bottom will empower the people and give them a chance to fight for changes they wants to take part in. LAMTIB will not force development on communities uninterested in making a change. They have to be motivated and feel ownership to both the process and results. LAMTIB differentiates on developing a country and making everyday life easier for the poor people. By directing development assistance towards local remote communities rather than whole countries will bring more concrete and specified targets to achieve, and might be more successful in the long run.

A challenge for LAMTIB is lack of interest from funding and enablers (Preststulen 2015), which will be further elaborated in chapter 5. For LAMTIB to make an impact, it need "kick-starter" finance, which might be a constraint, as institutions, business

enterprises, NGOs, individuals and philanthropists must be convinced that this initiative will bring social and environmental impact and create positive development and increase food security.

#### 4.4 Summary

Development is a local phenomenon, and will require local action, but the consequences might be global. Hence it is important to make global goals and guidelines that commit all countries to make an effort to improve the current situation but also secure the future generation. *“We have a shared responsibility to embark on a path to inclusive and shared prosperity in a peaceful and resilient world, where human rights and the rule of law are upheld”* (General Assembly 2014:3). Admittedly, global goals and guidelines are not satisfactory making an impact. One need targeted action that can turn goals into concrete results.

Global initiatives are crucial guidelines for all countries to be sustainable. Development and food security must be achieved locally, but directions from global development institutions are crucial, because food insecurity and underdevelopment are situations that will affect the whole world in the forces of globalisation where integration and interconnectedness are not only mandatory, but it will affect all parts involved, and the ones left out. However, it is not just global policy actors that are responsible of making the world a better place. All parts benefitting from globalisation must take their share of the cake, including the global community, business enterprises, the civil society and every man and woman.

The political rules that govern the system are a basic foundation of a well-functioning food system that will benefit all. The economic and ecological limitations and incentives, and how they interact have major impact on the function of the global food system. Finding policies and technology designed to alleviate and solve the problems of hunger, obesity, malnutrition and hunger, and the mismanagement of natural resources in a sustainable manner, is the real challenge (Pinstrup-Andersen and Watson 2011).

LAMTIB is a local actor in a global food system and globalised world. Through grassroots globalisation, the *“growing power of the civil society actors [will] influence decision making processes in governments and corporations”* (Sherer and Palazzo

2008:17), and focus on how globalisation can benefit local communities (Rigg 2007). Increasing the emphasis on local communities and integrate remote villages to the global market and the food system may make more resources available for human development.

## 5 DISCUSSION

Global food security and poverty are challenging issues threatening humanity. There are several major development agencies trying to improve the current situation, but there are so many factors influencing the direction of development. FAO and the UN have a particular emphasis on the link between food security and development. Food is a basic need and a human right, but still there are so many people suffering from food insecurity.

There is a general agreement that development and economic growth is key to increase global food security. However, it is the methods and theories that differ. Finding the right solutions in a myriad of alternatives, theories, technologies and practices is the real issue of discussion. We know what should top the list of priorities, but there are only a few suggestions on how to implement the vision to action. The agenda is unfinished (IFPRI 2002). LAMTIB might be a solution in the myriad of alternatives that may contribute to global food security and reducing poverty.

In this chapter LAMTIB will be in main focus, in addition to certain elements from the global food system. LAMTIB is the main focus area for the study, and a deeper discussion is therefore necessary. Other important elements of the study have been sufficiently clarified through the former chapters.

### 5.1 Global meets Local

Meeting the unfinished agenda pointed out by IFPRI (2002), moving from the global to the local will be crucial. Globalisation is setting the agenda for all kinds of human activities. It is often the ones on the outside of globalisation that are vulnerable and often poor (in a modern term). Of course some people and groups want to stand on the outside and live their life in the traditional way, and it should not be mandatory to be integrated on the global arena. However, there are excluded groups that want to be integrated.

Global food security is on the top of everyone's lists over crucial and urgent topics to address. As the population is growing and the climate is changing, food will be a scarce resource, unless changes and action is taken. To ensure global food security, the link to development and poverty reduction is crucial to include. However, how to escape

poverty and create development are questions with infinitely complex solutions. During different times, there have been different solutions on how to best achieve this goal. Modernisation, dependency, neo-liberalism and post-development are some of the theories trying to find the best solution. In addition, there are globalisation, hunger theories and institutions that have its own implementation and understanding of the processes needed to alleviate poverty and hunger. LAMTIB is a development initiative trying to address all challenges connected to poverty and development, and is seeking to find new and revolutionary approaches to be a sustainable initiative with long-term goals and solutions, which are indeed endless, and comes in all “shapes and colours”.

Globalisation has resulted in new strong and powerful participants in addition to governments. TNCs, development- and policy institutions and the media have the power to push limits and improve the world. Global actors and systems will influence local communities in one way or another, either positive or negative. Global integration is considered to be an influential force for alleviating hunger, poverty and empowering poor. Still the participation is uneven, making the impact of globalisation unequal. Despite the global in globalisation, the changes and impact will be local. *“Grassroots globalisation attempts to acknowledge – and promote- an alternative narrative, on the relish in different and recognises that the local can influence events, resist dominant and build alternative futures”* (Rigg 2007:20), an approach that focuses on how globalisation can benefit local communities.

Poverty and food insecurity are two major challenges for the global community to solve in a sustainable manner, and a focus on the local is important to be successful. Global initiatives are excellent guides, but they do not includes local differences and advantages when they are designing solutions that should be solved locally, on the grassroots through initiatives and organisations with local know-how about the community and the people. Scaling down initiatives to create development is difficult for major institutions who are leading within forming the policy, very often influenced by liberalistic and neo-liberalistic approaches implying that economic growth and global markets and systems will benefit most people possible. The neo-liberal approach have during the last few decades been accused of marginalising local communities with workers and peasants, which has led to a ‘race to the bottom’ rather than the much more preferred ‘race to the top’ (Rigg 2007).



Wallis (2002:192) points out a different view and argues *“the issue is not whether liberalisation is a good thing or a bad thing. [...] We should ask what policies – national and international – make liberalization work for rather against poor people, what policies captures the gains for poor people?”* Facilitating and protecting the vulnerable through a smooth transition into the global market can make liberalisation beneficial for the poor, and not expose them to trade barriers and structural adjustments that only favours the rich and already existing users of the global markets.

LAMTIB believes in global cross-sectorial and -scale collaboration and shared responsibilities, as already pointed out. Local grassroots initiatives will be an important supplement to global guidelines, as global impacts require local action, where local communities can take advantages of the benefits from globalisation.

*LAMTIB can contribute to a large extent in meeting overall global objectives in achieving food security and poverty alleviation, provided that the concept will be embraced by supporters of substance, [... such as] multinational organisations with serious social enterprise programs, NGOs, charity foundations, individuals like me, or better, with deeper pockets than me, and many more, understanding the importance of creating new win/win models with the main objective of empowering underprivileged in natural resource rich areas, and a secondary, equally important objective of increasing food security to the entire world (Presstulen 2015).*

Local and global initiatives fulfil one another, as global policies are not legally binding although countries have committed to achieve them. The enforcement of global policies are extremely difficult, and needs help from more locally focused initiatives that can implement global policy, and share responsibilities in the achievement of the goals, which will have both global and local impacts.

Sustainable development requires compound and innovative solutions, as well as knowledge and practical training. Development assistance has often failed in the effort to make sustainable changes. More and more actors, scholars and academics are requesting a new type of investment, where pro-poor growth is in focus. However, it is crucial that the entire society contributes and facilitates this pro-poor agenda, and especially in a rapid changing world with new threats, in terms of population growth, increased consumption and climate changes, as pointed out earlier. These are radical changes that require new perspectives from leaders, especially business leaders who are of the most powerful in the world, and can easily make changes, both for the better and worse. It requires leaders to rethink their operations and how to stay on track for a

sustainable future (DiPiazza 2012). It requires leaders to act in the local, national and international arena.

## 5.2 The LAMTIB Initiative

“Think globally, act locally”,<sup>24</sup> as mentioned earlier, is a great description of LAMTIB. The ambition is to grow larger and become a global initiative, in terms of geographical prevalence. The aim is to help as many as possible in the shortest amount of time, and it has no limitation of location, other than the village must be qualified and show motivation to improve their livelihoods, as well as some extent of locally available natural resources. LAMTIB seeks to be a global initiative, but still, the focus will be at the local. All sites are different, have different resources available, and have different needs. Adjusting global initiatives and policy to local needs and specifications will be crucial to achieve poverty and hunger alleviation. A world without hunger and poverty implies that no local communities or households are poor and suffer from food insecurity. Local and global are therefore two closely interlinked and dependent terms.

After several development projects failing as pointed out by among others, The National Audit Office (*Riksrevisjonen*) (2013-14), who posted a report, an examination of aid to clean energy. A report that emphasised a new type of investment with measureable social impacts, although measuring social impacts is quite difficult, as pointed out in 4.2.4. Development assistance carried out today has little or no measurable impact on the poor. *“Today, more investors and entrepreneurs than ever are proactively investing their capital in solutions designed to generate a positive social or environmental impact, while also having the potential for some financial return”* (Keating and Schöning 2012:3). This can be social value in terms of education, health care, clean water, sanitation and food production. In addition to income generating employment, all these are crucial elements in securing increased livelihoods, and change the lives of underprivileged people to the better.

However, investing with a social and environmental friendly value is not as easy as it sounds, and there are several pitfalls to avoid. *“Growth strategies need to be aimed at growing the overall market. If growth is driven by gaining market share from other*

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<sup>24</sup> René Dubos.

*social enterprises, little is won. People will just be served by someone else, instead of more people being served*" (von Kimakowitz 2012:16). Another challenge is the tension between financial return and social value (Balandina 2012). The initial intention to create positive social impact might be challenged by the possibility of profit. Through impact investment, LAMTIB is trying to unite local needs with global policy. LAMTIB has one solution, and is not meant as a substitute to other development initiatives, but as a supplement. Global, cross-sectorial and -scale is vital to find the best solutions in the fastest and most flexible way. Taking advantage of one another, as participants in development will increase the results. One of LAMTIB's strengths is that it is mobile and scalable, meaning it can be implemented quickly and adjusted to the local needs on the site.

### **5.2.1 Strengths and Weaknesses**

*"There are numerous initiatives constantly in process with the objectives of mitigating dire social consequences [...] most of these initiatives are brought forward through many international and national institutions and authorities"* (Preststulen 2015). These top-down approaches have not proven to be as effective as intended (*Riksrevisjonen* 2013-14). The major institutions assisting in development are today in an increasing manner requesting an investment with a social and environmental impact rather than development aid.

#### **Strengths**

One of LAMTIB strongest competitive strengths is the technological advancement, and the ability to offer the best, newest and cleanest (in terms of environmental friendly) solutions. This is one side that makes LAMTIB a unique initiative, and might bring success. Technological advancement is crucial in development, as the climate is vulnerable to pollution, which might have an enormous negative impact on development and the global food security. Equally is the situation regarding human resources. Southeast Asia is expected to hold about 90% of the future population growth (Srivatsan 2014), which may make people an excessive resource that should be exploited to create economic and social revenues.

It is challenging to examine and investigate the different assets and technologies to find out what works in which situation. There are vast opportunities and options of technology available, and finding the right solution can therefore be difficult. For example, ICT is a technology that has opened several new doors, and given us the potential to intensify and transform agriculture, as well as increase income-generating opportunities for more people all over the world (Pandya-Lorch 2002). LAMTIB addresses all these severe threats against food security through development and utilization of a container based solution. HIC and NIC are two solutions aiming at increasing global and local food security. HIC and NIC are using the ICT and energy container for technical support, system regulation, knowledge transfer, practical training, surveillance and control for maximum advantage from the technologies (Forset 2014).

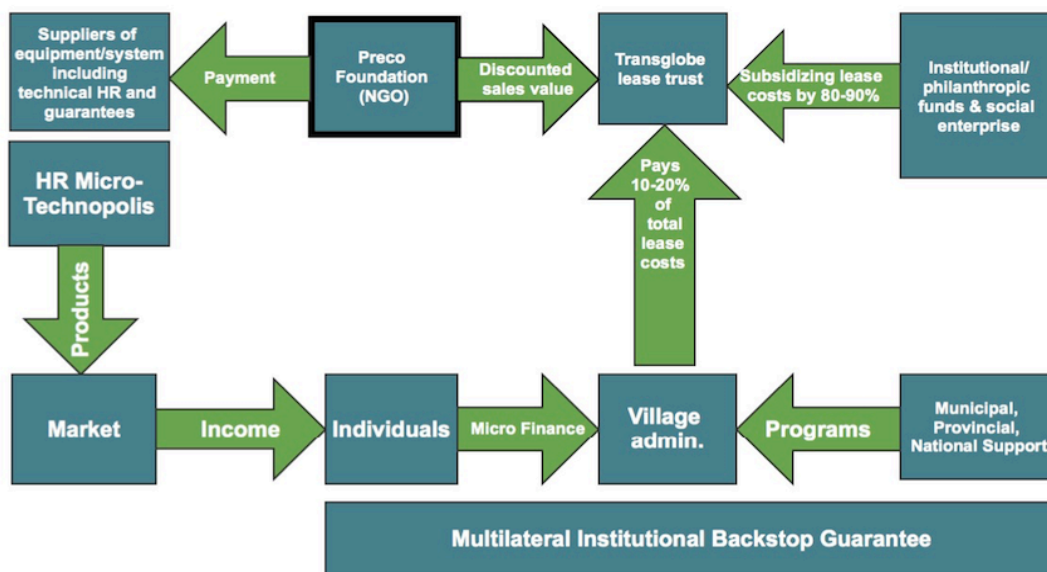
HIC and NIC may be key in sustaining and increasing local food production, both to supply the local and global market. Increased investments in poor rural areas will bring a range of benefits to the people living there. These are areas with poor infrastructure, lack of technical assistance and knowledge, resulting in diminishing activity and productivity. LAMTIB will enable knowledge transfer, equipment and increase agricultural output. Preststulen (2015) points out strategies such as LAMTIB, must be applied as global best- practice. It is crucial to find production strategies that will help poor farmers to boost the productivity. Knowledge about alternative agricultural practises, such as IMTA, aquaponics, cash rich diversified crops etc., are therefore central. These are all practices that will help small-scale farmers whilst fostering entrepreneurship and create small-scale businesses. In addition to farming, one can use natural resources such as coconuts to produce export related commodities such as coconut milk, -water, -oil etc. Agriculture is a very important element in development, and will be shown through LAMTIB. With some assistance in kick-starting development, economic growth and employments opportunities will rise in rural poor areas, and not only on the agricultural sector.

Basing all modules in standardised containers (foremost electricity, ICT, HIC, education and health care) makes the transportation easy and cost effective, as it is easy to scale up and down after the local needs, and the containers are robust and climate resistant.

*In order to make a large impact, we would need thousands of LAMTIB installations,*

each to become autonomous within the shortest possible time. LAMTIB has been conceived to support local villages, and to some extent relieve provincial and central authorities in their quest of reaching out to underprivileged. Building national infrastructure and services, often with scarce financial resources, is difficult and time-consuming. LAMTIB can be mobilized within just a few months for each site, after ascertaining the current situation, and can be removed to other locations at any time, when national efforts are ready to replace LAMTIB's functionality. This concept will also take away some of the pressure of too rapid urbanization (Preststulen 2015).

Another aspect making the initiative unique is that it is a community development project, which requires a motivated village, and not only a motivated village administration. All the inhabitants must be supportive to the project and be willing to participate. Motivation is considered a core element for the villages and people participating in LAMTIB. Poor and hungry people are the ones with the need and will to fight for increased livelihoods and food security (van de Sand 2002). However, they need access to material assistance through grassroots initiatives such as LAMTIB.



**Figure 4: Flow of Funds: How to finance LAMTIB.** This figure illustrates how the local community will be able to contribute to finance the modules themselves through employment opportunities and production that will generate an income and revenues that in some extent will be brought back in the project for further development. The flow of funds shows how a community-based development will increase livelihoods for the poor population living there. Source: Forset 2014, LAMTIB 2015.

LAMTIB requests the villages to contribute with a small part of the costs (5-10%) to feel ownership to the equipment, modules and changes. This will motivate the inhabitants to take responsibility and action for changes (see figure 4, below). Making

the changes at the bottom empowers the people to take part and advantage of the opportunities LAMTIB is designing. This results in small-scale businesses, with a local production and locally provided services.

For some villages, the financial contribution might be challenging, but LAMTIB has experienced that several states have programmes that they can apply, for financial support. Villages that manage this challenge show motivation and a wish for success, when implementing LAMTIB.

### **Weaknesses**

LAMTIB, as all development initiatives, have both strengths and weaknesses. It is a different initiative that tries to address challenges among the current development situation and current policies towards development. LAMTIB tries to turn around the top-down development attitude, by approaching directly to small remote communities and make changes on the grassroots, with specific targets for change.

LAMTIB is aimed at organising a collaboration between multiple partners, this is challenging as different partners might have different interest to maintain. For example, it might be an issue when collaborating with both business enterprises and philanthropic organisations. An organisational structure and clear areas of responsibility will therefore be crucial (see figure 2). It is very important to find reliable partners that are serious about achieving success and not pretenders, who only seek to be associated with LAMTIB. This might be actors who really wish for success, but where the contribution might be too hard or time consuming (Preststulen 2015).

LAMTIB is a very young initiative not completely implemented in the field. It is difficult to see how this particular initiative will influence and affect small remote communities. However, to make this a valuable and effective initiative, one needs to find investors and financial capital among businesses and organisations that believe in LAMTIB as a serious development actor. This might be among the largest challenges, and threats against the survival of the initiative. There will not be any short-term return on investments as the project is long-term. But there is a need for sufficient “*kick-starter*” capital (Preststulen 2015) to help the project come up and running. In the long run, LAMTIB is planned to be a self-sustained initiative and depends on financial return from the small-scale businesses and enable a positive cash flow (see figure 4, above).

The partners must seek to participate and make positive impacts and value creation in small remote villages.

*“Grassroots organizations usually have meagre financial resources, and some local needs, like the construction of adequate rural power and transport infrastructures, can be quite expensive. In addition, this local grassroots NGO strategy tends to be limited by what state authorities will accept”* (Paarlberg 2002:203). LAMTIB seek to solve this problem with limitation from state authorities, by starting the implementation process right in the village at the bottom of the political scale. Local support might act as a heavy weight in the government’s decisions in terms of permits, as they are dependent on their support. Political will is driven from pressure from below, from the underprivileged and requires collective empowerment of the inhabitants (van de Sand 2002).

There are also external threats intimidating LAMTIB. For instance: corruption (LAMTIB follows a zero tolerance policy), site management and motivation among the villages. These are threats that are difficult to manage. However, LAMTIB will have control mechanism trying to minimize all sorts of threats. At last there are climate changes, which can be a real threat to LAMTIB, and extremely difficult to control, but it is also a threat to poverty and food security, which is the aim for LAMTIB to improve.

### **5.3 The Global Food system**

Pogge (2014) points out that it is important to assign concrete tasks to competent agents in the field. To end hunger and poverty, the two largest threats towards humanity, we are dependent on concrete actions to make sure the goals are achieved. It is the structural causes that must be addressed and improved. The rich countries do have to take responsibility together with enterprises, organisations and the civil society to stop facilitating illegal financial outflows from the poor countries, stop imposing their protectionism on the global market and polluting without compensation. They should rather help facilitate pro-poor growth; economic as well as social; knowledge transfer and support of new and environmental friendly production systems; increased labour standards; and help poor countries catch up with the more advanced developed countries.

Food security is about more than just ensuring enough food. It is about sustainable livelihoods and giving people an income, therefore increased production is

not always adequate to make sure there is enough food available. In addition, moving people out of poverty, requires political will directed towards the poor that facilitates pro-poor growth so people may have a chance to improve their livelihoods and their food security as a result of this. Feeding a growing population in a world with increasing and new challenges, are a matter of food production and production strategies. However, ending hunger is about so much more. Ending hunger requires not only access to food, but people need to have the resources to acquire sufficient amounts of food (Paarlberg 2002). This is a dilemma regarding politics, both national and international, work opportunities, knowledge, production strategies and distribution, to mention a few, but highly relevant aspects.

The world needs to increase the total food production, especially regarding the future estimate of a population growth to 9.6 billion people (UN 2013), but alone this is not sufficient. In addition we also need to improve the distribution and access to the food available. The world food system is a fragile system, and to ensure increased food security, we need to improve the resistance to unpredictable incidents and changes. Finding environmentally friendly solutions is crucial as climate changes are not only a threat to certain people and areas, although the poor are more exposed to unpredictable incidents. Pollution and climate changes are global threats, and should be addressed locally through initiatives such as LAMTIB.

Southern countries are the countries, which experience the most hunger, and many of them have made it their policy not to be dependent on food import and the world food system. South Asia is an example, where several countries have a policy of importing only about 2% of their total grain consumption. This results in a national surplus in food supply. Despite sufficient food available at the national markets, this region still has one of the largest numbers of hungry people in the world (Paarlberg 2002). One can argue that this has become the result of structural adjustments that were forced upon many developing countries. Baran (1957) argues that it has been in the interest of capitalism to keep, what he called, "*backward world as an indispensable hinterland*" to provide cheap and easily accessible raw materials to the rich countries. This must change to overcome the global variations and inequalities in the world, and to secure global food security.

*The food entitlement systems that are breaking down and leaving hungry today are mostly local systems not global systems [...] Because the causes of hunger are so often local, thinking globally about this problem can actually be misleading. If we*



*think globally about the problem we end up worrying too much, about the price of the food in the world market (Paarlberg 2002:202-3).*

However, not everything can be done either locally or nationally. Some things can only be achieved and enabled by global institutions, such as capable food aid systems; global famine early warning systems; and capable international agricultural research institutions (Paarlberg 2002). This illustrates how important cross-scale and –sector collaboration is to achieve the global goals: “*end poverty in all its forms everywhere and end hunger, achieve food security and improved nutrition and promote sustainable agriculture*” (UN 2014b).

Without collaborating business enterprises, international organisations, governments and NGOs, there will be extremely hard to find the right solutions for regulation and behaviour globally. In addition to empower people and communities nationally, there is also a need to empower developing countries in global collaborations processes and negotiations, as the current global situation holds an unequal power relationship where developing countries are often marginalised.

Global food security is interdependent with household food security, and will be more challenging as the population is growing, the climate is changing and the consumption is increasing. One obvious solution is to intensify through advancement and technological innovation. Increased production output will make sure there are sufficient amounts of food available at the global markets. For people to access this food, one must combine increased agricultural output with employment and income opportunities for the poor. IMTA is a good example, where the production of high value commodities increases the natural habitat for fish and other seafood. This increases global and local food security, through expanded production and employment. Although most of the poor lives in rural areas, it does not make the solution all alone agricultural, as already pointed out. Creating non-agricultural employment opportunities in rural areas, will decrease urbanisation, as most people migrate to find job and in the pursuit of better opportunities.

To end hunger it is necessary to identify the causes, and then turn them around and make them an advantage to increase world food security. World Food Programme (WFP) (2015b) identifies 6 main causes for food insecurity: lack of investment in agriculture, climate and weather, war and displacement, food wastages, unstable markets and poverty trap. To reach the targets of ending poverty and hunger, a

combination of factors must be combined and addressed. There are several possible solutions as the challenges are infinitely complex.

Increased investments in rural infrastructure and in agriculture may result in lower transportation costs, employment opportunities and stable water supply. FAO has shown that it is five times more effective to invest in agriculture than in any other sector (WPF 2015b). To make agriculture more productive and sustainable is one of FAO's Strategic Objectives (2015b). Food security will be "*achieved if the necessary investment is undertaken and policies conducive to agricultural production are put in place*" (FAO 2009b). However, as Sen (1981) points out "*the problem in developing countries is not that there is too little food, but that it is improperly distributed*" (Scalet and Schmidt 2010:187). Improperly distribution is mostly a national phenomenon, as a result of poor infrastructure, remoteness of several communities and national protection policies.

There are many local factors that will vary from country to country, and generalising solutions will therefore not be sufficient to achieve the global development targets. These are factors such as motivation for development, corruption, access to natural resources and bureaucracy that are determining the progress and commitment to development. National factors, foreign policy and protectionism are important explanatory factors in the persistence of poverty. To explain why poverty eradication have been successful in some areas and not in others, are many and different, and we must have an understanding of how local factors can have an influence on the larger system (Pogge 2015).

To ensure long-term access to nutritious and affordable food, it is necessary to be innovative and creative in a sustainable manner by lowering pollution (CO<sub>2</sub> and green house gasses) and reducing biodiversity losses, as there already is an increasing pressure on the world's resources (Foley et al. 2011). At the same time it is necessary to facilitate a more equal distribution pattern, and make sure everyone has access to the food available. With the right investments and incentives, the environmental footprint in agriculture can be eased (World Bank 2007). However, this is a complicated process, due to the many competing agendas. In developing countries, it is the power of capital and expertise that drives operators and TNCs to source, and in many cases, over-exploit natural resources in an unstable manner (Preststulen 2015). It is therefore crucial to unite TNC's and developing actors' agenda to make positive impacts and improve the current situation by reducing the number of poor and hungry.

## 5.4 Validity and Reliability

The criterion for reliability and validity is essential to assess, and to look at in which degree the theoretical framework and data collected has been relevant to answer the research questions. In the evaluation of the LAMTIB Initiative as an adequate development initiative it is necessary to look at the validity and reliability of the analysis and results. Validity refers to the research questions, and if the study has answered the questions that were intended to answer (Jacobsen 2005) Internal validity refers to the balance between observations and theoretical anticipations developed as a result of the study. Reliability on the other hand refers to trustworthiness and if the results are replicable (Tjora 2011).

### 5.4.1 Validity

Evaluating LAMTIB as a development initiative was the main purpose in this study together with an examination of the global food system using UN and FAO as global policy actors, and look at how they can contribute to sustainable food security and development. A generalisation of my findings, have not been either expedient or possible as the study is an examination of one single case in a combination of global development actors and initiatives. The research questions are complex with countless approaches and solutions. Answering these questions have therefore been challenging, and the risk of having excluded central aspects, elements, theories and opinions, are obviously present. However, as pointed out in paragraph 1.3, *the aim is therefore to help understand and discuss certain elements related to the topic and put it in context of the case and research questions.*

The analysis has been done applying a theoretical framework, and a fieldwork has not been conducted, and the actual effects of LAMTIB's installations in a local community have not been evaluated, due to the fact that LAMTIB is still in the start phase, and it is currently only one container placed in the field. Because of this, it is difficult to see if LAMTIB will bring the results and impacts as it wishes in terms of positive development, poverty reduction and increased food security. LAMTIB has only been evaluated and studied from an organisational perspective, through the methods of ethnography/ participant observation and interview with Tom Preststulen, the initiator behind the project. All information conducted and applied in the analysis, regarding

LAMTIB, is based on knowledge, information and experiences given directly from the organisation.

The potential for LAMTIB to contribute in making the world a better place for more people, is present. The initiative is evaluated to be feasible. However there are a few very important aspects, as discussed in paragraph 5.2.1 that must be fulfilled for it to be successful. Financial support is crucial to enable implementation and to see if the projects will bring social and environmental value to the community.

The analysis of LAMTIB might be one sided, although, several aspects are substantiated from existing theory and experiences. There is extensive literature on the research topic, and an increasingly part of the literature is requesting a new and different approach towards development. A request for a new and practical way of thinking about development and food security is the foundation of LAMTIB, an alternative approach to the existing top-down systems, which in many cases, has not given the intended results. Therefore, seeking new direction and alternative ways to improve the lives of the poor are necessary. The theoretical framework presented in chapter 3 is verifying several aspects regarding LAMTIB and how the initiative should target development.

A further analysis of LAMTIB should be in the field, and of the actual effects LAMTIB may have on a specific or several remote communities, and if the effects are as intended. Will LAMTIB contribute to sustainable food security and development? Such analysis will strongly increase the integrity of the study and confirm or reject the assumptions about LAMTIB being a good supplement to current development approaches.

#### **5.4.2 Reliability**

A study will always contain the risk of mistakes, and in this study, a one sided perspective of LAMTIB may have been a weakness. How it will influence and improve the situation of food security and development must be analysed in the field, and measured after several LAMTIB installation are in place

Two of the methods applied in the study are ethnography/participant observations and interview. Because there is no existing literature on LAMTIB, and all information regarding LAMTIB is obtained through one of these methods, makes the study difficult to replicate. Most of the knowledge and information is acquired through

personal experience as intern working with the project. A single interview with the initiator behind the project, Tom Preststulen may illustrate the initiative subjectively, and is linked to the moral judgement, due to the informants strong feelings about the initiative one are studying (Tjora 2011). To get a more nuanced representation of the case, including separate methods, such as literature and participant observations, are underpinning several of the findings. Although, a second interview of an external actor could have been relevant, and given a more critical view on LAMTIB as a development initiative.

In the study, I have combined different methods to illustrate LAMTIB in an objective way as possible. There is existing literature requesting new approaches and theories towards development, a more applied and practical approach focusing on the local in a combination of the global. The study is not intended to compare LAMTIB with other equivalent initiatives. It is an examination of its strengths and weaknesses as a development initiative, and as an alternative to the top-down approaches offered from the major development institutions such as UN and FAO.

Applying secondary literature may be a weakness of the study. However, it is only applied where it has been to time consuming and difficult/impossible to find the original source. I am aware they might not be quite trustworthy, but I trust the sources where found have not misused or taken them out of original context.

## **5.5 Summary**

There is no simple solution to global injustice, and making structural changes in the global institutional order, to benefit the weaker countries, may have a positive effect. Scholars argue that the systematic disadvantages of poorer countries have increased the power and wealth in rich advanced countries. This can directly be linked to the development theory, where Andre Gunder Frank argues that an active underdevelopment and exploitation of poor countries have led to a deeper poverty and dependency to developed countries and an increased misbalance in their relationship (Chant and McIlwaine 2009). Empowering the underprivileged is indeed crucial, and not only at the grassroots, in all scales, for the poor to benefit from the global food system.

New approaches towards development are necessary to reach global development goals and make changes at the local scale. LAMTIB is an alternative to the

global top-down development approaches, and focuses more on the local needs. LAMTIB has great potential to create positive impact in remote communities through global integration, social modules and income generating employment opportunities, but this still remains. From an organisational perspective, the potential is there, despite LAMTIB's weaknesses. LAMTIB is ready to commit to make a change through a more market related business model, where the aim is to help underprivileged people to sustainable self-help opportunities. Creating opportunities for them to take, and turn into action.

## 6 CONCLUSION

The purpose with this study is to examine and contribute to an understanding of the policy around the current global food system and look at how mainly FAO and UN agencies and the LAMTIB Initiative can contribute to food security and sustainable development in Southeast Asia.

The research question is as follows; *how can the global food system create sustainable food security, and how food security is relevant in development.*

The global food system can contribute to sustainable food security in a number of ways, though there are no bulletproof solutions. The world develops continuously, and many factors may determine the outcome of the measures taken and to whom they benefit. As the future is by nature uncertain, feeding a growing population may prove more comprehensive than securing increased food security at present. As for the situation today, the entitlement approach has some valid arguments; that it is a matter of distribution and access, as the current level of production is enough to feed every person in the world (Conway 2012). Feeding a growing population, there must be provided a more complex answer, and it is necessary to combine the entitlement approach with the availability approach. It will be necessary to increase food production and even out the unequal distribution by giving more people access. However, there is a difference in feeding a growing population and ending hunger. The former is a matter of production strategies and increased production. The latter requires a more comprehensive solution, including knowledge, employment, international trade, pro-poor growth, policy, global governance and development policy. Giving access to food is not by itself enough, one also needs to provide the resources necessary to acquire the food available (Paarlberg 2002), and it is a general agreement that development and economic growth will help increasing food security. To achieve WFS' four dimensions of food security, a global integration of the poor may have positive effect.

The link between food (in)security and development is clear. Bilden (2012) argues that poverty is the main cause for hunger. After the FAO conference in 2009, the causes of hunger and malnutrition were clearly identified: poor people cannot access the food that is available due to lack of infrastructure, income and absence of social security (FAO 2009b, Bilden 2012). As the causes of hunger and food insecurity are several, often intertwined, it is important to avoid false causation, thus it is necessary to look at all

elements contributing to the link between food security and poverty. Regardless, policies aimed at agricultural and rural development has proven to be successful, but the effects have often been underestimated. FAO (2003:218-19) argues that strategies for poverty reduction is most effective through “*labour intensive food production based growth*”, and to reach the marginalised, structures and policies must target the poor in rural areas.

FAO and UN are pioneers in giving attention to urgent situations and make initiatives and policies. Nevertheless, goals and theories are not adequate in fighting poverty and food insecurity. The issue is to enforce these policies. Local initiatives such as LAMTIB will be a vital element in order to achieve and implement FAO and UN’s policies in regard to the global development goals. It is the smaller local initiatives that are best fitted to implement and achieve the goals, as they have more specific knowledge and targeted responsibilities about different locations and situations. In Southeast Asia, as in the rest of the world, all countries and villages have different initial levels of development. It is important to understand these differences and include this knowledge into the development process. As such, global institutions make the guidelines and the grassroots initiative takes these policies together with the knowledge about geographical differences into action. Creating development and food security must therefore happen on a local scale through a bottom-up approach empowering the marginalised and poor.

*“We know what we have to do. It is up to you and me to do it. Saving civilization is not a spectator sport”* (Brown 2012:123), however enforcing policies in the global community seems more or less impossible, as it is an anarchy run by sovereign states. Hence it is a need for global initiatives to set this urgent situation on the agenda for target specific initiatives such LAMTIB, who works at the grassroots with local know-how thus adjusting development to their needs. This constitutes a different type of development initiative that puts an emphasise on social impact and economic and environmental sustainability, through global integration, social development and income generating employment opportunities. LAMTIB is aiming to do business that trades for social and/or environmental friendly purpose. It will know what difference it is trying to make, and it will bring in most of its income through selling goods or services (Social Enterprise UK 2015).



To end hunger and achieve global food security, global has to meet local, as no one can manage such changes by themselves. Collaboration is crucial. Change and development has to be rooted in the will to create a new path by local actors together with initiatives such as LAMTIB who has great potential to make a change. LAMTIB and other similar initiatives offer a new way of thinking by introducing new technologies and approaching the issues with a model based on impact investment, CSR and social entrepreneurship. *Hunger is the world's greatest scandal* (NRK 2010), and requires immediate and targeted actions. The world must collaborate at all scales and include all sectors and take responsibility to end hunger and poverty.

*We should strive to be able to make a claim like McDonald's by the year 2020 and be able to say we have served over 1 billion people - although as you can guess, I am not suggesting we serve them hamburgers* (Dalrymple 2002:39).



## 7 LITERATURE

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## APPENDIXES

### Appendix A: Interview

Email interview with Tom Preststulen, managing Partner Elkem Chartering, initiator and mastermind behind the LAMTIB Initiative.

#### **1. What is the background for initiating LAMTIB? How did you first get involved with development? What caught your interest?**

During more than 40 years, I have been working with rural areas in Africa, South America and Asia. Gradually I also learnt more about new technologies, some even disruptive, especially within renewable energy like solar and wind, web real time communication, logistics, and niches within food production. A couple of years ago, it just dawned on me that some of the underprivileged people living in areas with natural resources, but without such facilities, can in fact leapfrog out of poverty, if they want to, and if more people like me, and institutions, can help kick-starting progress.

#### **2. Your thoughts on how food (in)security is relevant in development?**

For obvious reasons, food security is back on the political agenda worldwide. I believe the question is how to ensure long-term access to nutritious and affordable food, whilst avoiding policies for the "big and included" to have negative impacts on the "poor and excluded". That's complicated because of the many competing agendas, especially in the developed world. In the developing world, the power of capital and expertise drive international traders and operators to source marine and dry land resources, leaving often unsustainable low margins with the rural population, and in many cases, over-exploiting natural resources, also in an unsustainable manner. Wherever it is possible, the developing world should be/become self-sufficient in local production of food, in a re-generative manner, and at the same time build a basis for exports. In many cases, LAMTIB would enable local people to substantially improve their current situations.

#### **3. How will initiatives such as LAMTIB have an effect on development (in a global perspective)?**

I believe that initiatives like LAMTIB, implemented as a global best-practice, will have

cost-effective and high yield effects. Teaching local people how to participate in boosting productivity from e.g. integrated multi-trophic aquaculture, aquaponics, cash rich diversified crops on land, and other small-scale activities, whilst fostering entrepreneurship whenever talents come forward, are some of the best ways in making use of electricity and Internet communication. In order to make a large impact, we would need thousands of LAMTIB installations, each to become autonomous within the shortest possible time. LAMTIB has been conceived to support local villages, and to some extent relieve provincial and central authorities in their quest of reaching out to underprivileged. Building national infrastructure and services, often with scarce financial resources, is difficult and time-consuming. LAMTIB can be mobilized within just a few months for each site, after ascertaining the current situation, and can be removed to other locations at any time, when national efforts are ready to replace LAMTIB's functionality. This concept will also take away some of the pressure of too rapid urbanization.

**4. Will initiatives, such as LAMTIB, have an impact on global policy actors such as UN, FAO and/or WTO? Will it have an impact on their politics regarding development, poverty reduction and/or food security?**

Perhaps this is a bit of the chicken and the egg syndrome. UN, FAO and WTO are well aware of the huge mega challenges that the under-privileged of this world represent. There are numerous initiatives constantly in process with the objective of mitigating dire social consequences. To my knowledge, most of these initiatives are brought forward through many international and national institutions and authorities, by mostly "top-down" approaches. If system and behavioral changes to the better can be achieved this way, reaching the underprivileged, then that's great. LAMTIB, as a complementary, not competing initiative, is a "bottom-up" approach. When several LAMTIB micro-technopolis can be demonstrated, UN, FAO and WTO, and many other institutions, may decide to include LAMTIB as a viable contributor, and to some extent influence their own politics. I think that the wider the network of LAMTIBs we will be able to implement with the help of good believers, followers and doers, the more likely it would be that we will come on the radar screens of the big policy makers.

**5. Will international policy actors such as UN, FAO and/or WTO influence smaller**

### **initiatives working on the grassroots?**

This question is somewhat associated with the previous one. I have been in touch with a few corners of UN and FAO, and I have the impression that there are relevant priority programmes to the LAMTIB initiative. It is an important part of LAMTIB's action plan to build a comprehensive network of pro bono advisers, including policy makers within large institutions who are working with the many problem areas of the underprivileged. We need a comprehensive matrix-organisation of like-minded, with complementary expertise, to make a substantial impact.

### **6. Do you think the implementation of the new sustainable development goals (SDGs) will improve the situation for the world's poor? And at the same time increase the global food security?**

The expected sustainable development goals will face an annual investment deficit of some 2.5 trillion USD per year in developing countries. In this current world of political unrest, galloping debt accumulations, over-capacities, lower annual growth, low profitability/deficits, the question is how to be efficient in reaching the goals and objectives of SDG within this programme's time-span? Full engagement from all sectors is critical. How can cooperation become efficient when there are so many different views of what are the priority areas? Under these circumstances, the objective of producing 60 % more food by 2050 to feed the expected nine billion people, whilst experiencing serious environmental and climate concerns, looks like Mission Impossible IV. Business as usual is not an option. We must simply be smarter, and more agile; just-go-and-do-it mentality.

Empowering farmers to provide for themselves and their communities will provide lasting benefits. In order to empower these rural people, we must include them in global conversations, ascertaining their needs, and the solutions to those needs. This is a central part of the LAMTIB initiative. Cross-sectorial collaboration is a crucial enabler.

To quote the Dutch ambassador to UN, and chair of the UN Committee on World Food Security, Gerda Verburg, " If we are serious about our commitment to end hunger in our lifetimes, then we must build bridges across existing divides- between rich and poor nations, industry and civil society, and so on. Out of diversity of voices will come a diversity of approaches".

LAMTIB can become an important part of the "diversity of approaches", provided that we can gain sufficient support to this initiative, which has already demonstrated proof of concept in the field.

## **FOLLOW-UP QUESTIONS**

### **1. In which areas and to what extent, will LAMTIB meet/fulfil overall global initiatives such as UN, FAO in their effort of achieving global food security and poverty alleviation?**

I believe that we should be bold and positive when implementing LAMTIB, with the objective of reaching out, over the shortest possible period of time, to a maximum number of villages in need of the LAMTIB technologies and expertise. The different segments of technologies must be tailor-made as a mix with the local circumstances, although each module is provided as a standard unit, not for sale, but as an enabler to be shared between NGOs, local initiatives etc. Expansion can come in phases; in conjunction with assimilation. To quote Napoleon, who was known to be a master strategist, even if he lost in the end; "First we engage, then we see".

Obviously, the proof of the technologies (which we have), appropriate finance, and an efficient organization, must be in place before any launch, but then adaptability will inevitably be required to optimize each operation.

LAMTIB can contribute to a large extent in meeting overall global objectives in achieving food security and poverty alleviation, provided that the concept will be embraced by supporters of substance, like the institutions you mention, as well as multinational organisations with serious social enterprise programmes, NGOs, charity foundations, individuals like me, or better, with deeper pockets than me, and many more, understanding the importance of creating new win/win models with the main objective of empowering underprivileged in natural resource rich areas, and a secondary, equally important objective of increasing food security to the entire world.

### **2. In which areas and to what extent will LAMTIB come to short in meeting/fulfilling overall initiatives such as UN, FAO in their effort of achieving global food security and poverty alleviation?**

The flip-side of my previous answer to a constructive way forward, is simply not making a substantial impact with LAMTIB, mainly because of a lack of interest from funding



enablers. LAMTIB will achieve success technologically, and equally from the aspect of human resources. But if we end up lacking sufficient "kick-starter" finance (required before we get to positive cash-flows), in order to implement multiple LAMTIBS in many countries, we would in my view come to short.

Other impediments could be from "pretenders" who would like to be associated with LAMTIB in one way or another; they seemingly wish for success, they really want it to be a success, but to contribute to it; that's something which became too hard, and time-consuming for this type of specie to really relate to. So, obviously, real motivation and persistency will be required by all associates, whether inside the LAMTIB organization, and/or in matrix within institutions/NGOs/multinationals etc.

There's a lot of hype about corruption in many countries, quite understandably, and this could also be a risk for LAMTIB. My experience is, however, that there are numerous ways of avoiding getting trapped, it's of course just not acceptable. In the case of LAMTIB, we will get backing from those who need our support on the ground. If there is a situation whereby this is not the case, and/or the underprivileged are being excessively suppressed by "administration", we will just have to pass, and go forward to other situations in need. Actually, part of LAMTIB's programme is to pre-qualify villages, ensuring that there is appropriate support and motivation on the ground before we start any specific programme.



## Appendix B: Millennium Development Goals (MDGs)

Source: UN. 2014a. *The Millennium Development Goals Report*. United Nations, New York.

GOAL	TARGET
1. Eradicate Extreme Poverty and Hunger	<ol style="list-style-type: none"> <li>1. Halve, between 1990 and 2015, the proportion of people whose income is less than US\$ 1 a day</li> <li>2. Halve, between 1990 and 2015, the proportion of people who suffer from hunger</li> </ol>
2. Achieve Universal Primary Education	<ol style="list-style-type: none"> <li>3. Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling</li> </ol>
3. Promote Gender Equality and Empower Women	<ol style="list-style-type: none"> <li>4. Eliminate gender disparity in primary and secondary education preferably by 2005 and in all levels of education no later than 2015</li> </ol>
4. Reduce Child Mortality	<ol style="list-style-type: none"> <li>5. Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate</li> </ol>
5. Improve Maternal Health	<ol style="list-style-type: none"> <li>6. Reduce by three-quarters, between 1990 and 2015, the maternal mortality rate</li> </ol>
6. Combat HIV/AIDS, Malaria and Other Diseases	<ol style="list-style-type: none"> <li>7. Have halted by 2015, and begun to reverse, the spread of HIV/AIDS</li> <li>8. Have halted by 2015, and begun to reverse, the incidence of malaria and other major diseases</li> </ol>
7. Ensure Environmental Sustainability	<ol style="list-style-type: none"> <li>9. Integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources</li> <li>10. Halve, by 2015, the proportion of people without sustainable access to safe drinking-water</li> <li>11. By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers</li> </ol>

## 8. Develop a Global Partnership for Development

12. Develop further an open, rule-based, predictable, non-discriminatory trading and financial system
13. Address the special needs of the LDCs
14. Address the special needs of landlocked countries and small island developing states
15. Deal comprehensively with the debt problems of developing countries through national and international measures in order to make debt sustainable in the long term
16. In cooperation with developing countries, develop and implement strategies for decent and productive work for youth
17. In cooperation with pharmaceutical companies, provide access to affordable, essential drugs in developing countries
18. In cooperation with the private sector, make available the benefits of new technologies, especially in information and communication

## Appendix C: Sustainable Development Goals (SDG)

Source: UN. 2014. *Open Working Group Proposal for Sustainable Development Goals* [online], UN. Available at: [http://www.un.org/ga/search/view\\_doc.asp?symbol=A/68/970](http://www.un.org/ga/search/view_doc.asp?symbol=A/68/970) [Date: 11. March 2015].

GOAL	TARGET
<p>1. End poverty in all its forms everywhere</p>	<ol style="list-style-type: none"> <li>1. By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than \$1.25 a day</li> <li>2. Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable</li> <li>3. By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance</li> <li>4. By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters</li> </ol>
<p>2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture</p>	<ol style="list-style-type: none"> <li>1. By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations to safe, nutritious and sufficient food all year round</li> <li>2. By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons</li> <li>3. By 2030, double the agricultural productivity and incomes of small-scale food producers, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment</li> <li>4. By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality</li> <li>5. By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and ensure access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed</li> </ol>
<p>3. Ensure healthy lives and promote well-being for all at all ages</p>	<ol style="list-style-type: none"> <li>1. By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births</li> <li>2. By 2030, end preventable deaths of new-borns and children under 5 years of age</li> <li>3. By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases</li> <li>4. By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and</li> </ol>

	<p>promote mental health and well being</p> <ol style="list-style-type: none"> <li>5. Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol</li> <li>6. By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes</li> <li>7. Achieve universal health coverage, including financial risk protection, access to quality essential healthcare services and access to safe, effective, quality and affordable essential medicines and vaccines for all</li> <li>8. 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination</li> </ol>
<p>4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all</p>	<ol style="list-style-type: none"> <li>1. By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes</li> <li>2. By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university</li> <li>3. By 2030, increase by [x] per cent the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship</li> <li>4. By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations</li> <li>5. By 2030, ensure that all youth achieve literacy and numeracy</li> <li>6. By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non- violence, global citizenship and appreciation of cultural diversity and of culture’s contribution to sustainable development</li> </ol>
<p>5. Achieve gender equality and empower all women and girls</p>	<ol style="list-style-type: none"> <li>1. End all forms of discrimination against all women and girls everywhere</li> <li>2. Eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation</li> <li>3. Eliminate all harmful practices, such as child, early and forced marriage and female genital mutilation</li> <li>4. Ensure women’s full and effective participation and equal opportunities for leadership at all levels of decision making in political, economic and public life</li> </ol>
<p>6. Ensure availability and sustainable management of water and sanitation for all</p>	<ol style="list-style-type: none"> <li>1. By 2030, achieve universal and equitable access to safe and affordable drinking water for all</li> <li>2. By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations</li> <li>3. By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and increasing recycling and safe reuse</li> <li>4. By 2030, substantially increase water-use efficiency across all</li> </ol>

	<p>sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity</p> <ol style="list-style-type: none"> <li>5. By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate</li> <li>6. By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes</li> </ol>
<p>7. Ensure access to affordable, reliable, sustainable and modern energy for all</p>	<ol style="list-style-type: none"> <li>1. By 2030, ensure universal access to affordable, reliable and modern energy services</li> <li>2. By 2030, increase substantially the share of renewable energy in the global energy mix</li> <li>3. By 2030, double the global rate of improvement in energy efficiency</li> </ol>
<p>8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all</p>	<ol style="list-style-type: none"> <li>1. Sustain per capita economic growth in accordance with national circumstances and, in particular, at least 7 per cent gross domestic product growth per annum in the least developed countries</li> <li>2. Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value-added and labour-intensive sectors</li> <li>3. Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services</li> <li>4. Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation</li> <li>5. By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal values</li> <li>6. Take immediate and effective measures to secure the prohibition and elimination of the worst forms of child labour, eradicate forced labour and, by 2025, end child labour in all its forms, including the recruitment and use of child soldiers</li> <li>7. Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment</li> <li>8. By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products</li> <li>9. Strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all</li> </ol>
<p>9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation</p>	<ol style="list-style-type: none"> <li>1. Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all</li> <li>2. Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries</li> <li>3. Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains</li> </ol>

	<p>and markets</p> <ol style="list-style-type: none"> <li>4. By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities</li> <li>5. Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries,</li> </ol>
<p><b>10. Reduce inequality within and among countries</b></p>	<ol style="list-style-type: none"> <li>1. By 2030, progressively achieve and sustain income growth of the bottom 40 per cent of the population at a rate higher than the national average</li> <li>2. By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status</li> <li>3. Ensure equal opportunity and reduce inequalities of outcome, including by eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and action in this regard</li> <li>4. Adopt policies, especially fiscal, wage and social protection policies, and progressively achieve greater equality</li> <li>5. Improve the regulation and monitoring of global financial markets and institutions and strengthen the implementation of such regulations</li> <li>6. Ensure enhanced representation and voice for developing countries in decision-making in global international economic and financial institutions in order to deliver more effective, credible, accountable and legitimate institutions</li> <li>7. Facilitate orderly, safe, regular and responsible migration and mobility of people, including through the implementation of planned and well-managed migration policies</li> </ol>
<p><b>11. Make cities and human settlements inclusive, safe, resilient and sustainable</b></p>	<ol style="list-style-type: none"> <li>1. By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums</li> <li>2. By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons</li> <li>3. Strengthen efforts to protect and safeguard the world's cultural and natural heritage</li> <li>4. By 2030, significantly reduce the number of deaths and the number of people affected and decrease the economic losses relative to gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations</li> <li>5. By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management</li> </ol>
<p><b>12. Ensure sustainable consumption and production patterns</b></p>	<ol style="list-style-type: none"> <li>1. Implement the 10-year framework of programmes on sustainable consumption and production, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries</li> <li>2. By 2030, achieve the sustainable management and efficient use of natural resources</li> <li>3. By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and</li> </ol>



	<p>supply chains, including post-harvest losses</p> <ol style="list-style-type: none"> <li>4. By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse</li> <li>5. Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle</li> <li>6. By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature</li> </ol>
<p>13. Take urgent action to combat climate change and its impacts*</p>	<ol style="list-style-type: none"> <li>1. Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries</li> <li>2. Integrate climate change measures into national policies, strategies and planning</li> <li>3. Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning</li> </ol>
<p>14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development</p>	<ol style="list-style-type: none"> <li>1. By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution</li> <li>2. By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts and take action for their restoration in order to achieve healthy and productive oceans</li> <li>3. Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels</li> <li>4. By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible</li> <li>5. By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law</li> </ol>
<p>15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss</p>	<ol style="list-style-type: none"> <li>1. By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements</li> <li>2. By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and increase afforestation and reforestation globally</li> <li>3. By 2020, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land-degradation-neutral world</li> <li>4. By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development</li> <li>5. Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species</li> <li>6. Ensure fair and equitable sharing of the benefits arising from the utilization of genetic resources and promote appropriate access to such resources</li> <li>7. Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products</li> <li>8. By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species</li> </ol>

	<ol style="list-style-type: none"> <li>9. By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts</li> </ol>
<p>16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels</p>	<ol style="list-style-type: none"> <li>1. Significantly reduce all forms of violence and related death rates everywhere</li> <li>2. End abuse, exploitation, trafficking and all forms of violence against and torture of children</li> <li>3. Promote the rule of law at the national and international levels and ensure equal access to justice for all</li> <li>4. Substantially reduce corruption and bribery in all their forms</li> <li>5. Develop effective, accountable and transparent institutions at all levels</li> <li>6. Ensure responsive, inclusive, participatory and representative decision making at all levels</li> <li>7. Broaden and strengthen the participation of developing countries in the institutions of global governance</li> <li>8. By 2030, provide legal identity for all, including birth registration</li> <li>9. Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements</li> </ol>
<p>17. Strengthen the means of implementation and revitalize the global partnership for sustainable development</p>	<ol style="list-style-type: none"> <li>1. Developed countries to implement fully their official development assistance commitments, including to provide 0.7 per cent of gross national income in official development assistance to developing countries, of which 0.15 to 0.20 per cent should be provided to least developed countries</li> <li>2. Mobilize additional financial resources for developing countries from multiple sources</li> <li>3. Assist developing countries in attaining long-term debt sustainability through coordinated policies aimed at fostering debt financing, debt relief and debt restructuring, as appropriate, and address the external debt of highly indebted poor countries to reduce debt distress</li> <li>4. Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge sharing on mutually agreed terms,</li> <li>5. Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed</li> <li>6. Enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all the sustainable development goals, including through North-South, South-South and triangular cooperation</li> <li>7. Significantly increase the exports of developing countries, in particular with a view to doubling the least developed countries' share of global exports by 2020</li> <li>8. Enhance global macroeconomic stability, including through policy coordination and policy coherence</li> <li>9. Enhance policy coherence for sustainable development</li> <li>10. Enhance the global partnership for sustainable development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries</li> <li>11. By 2020, enhance capacity-building support to developing</li> </ol>

countries, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts

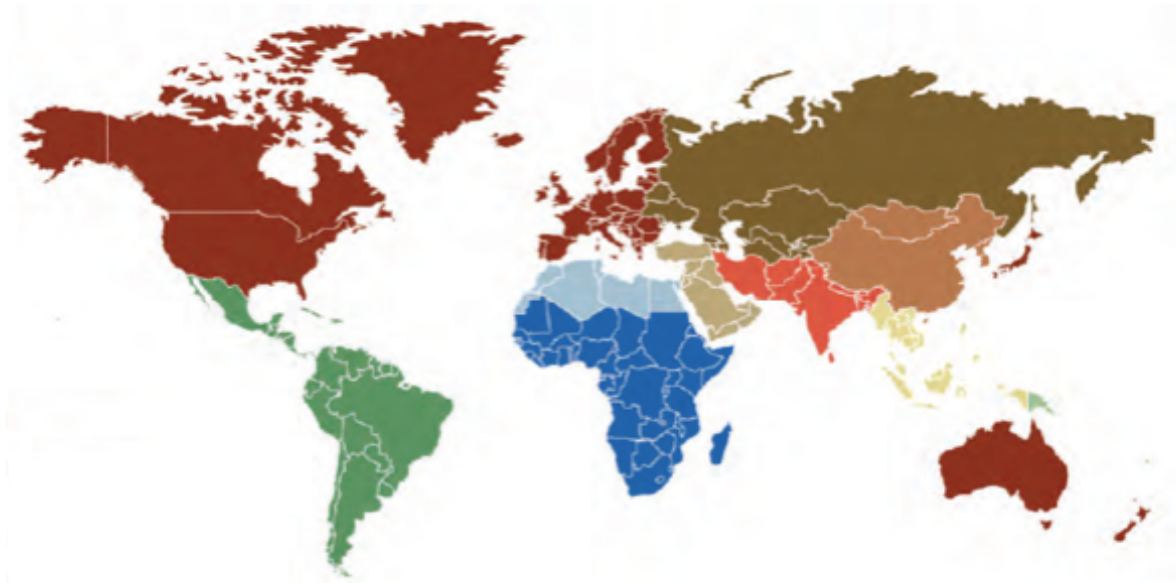
\* Acknowledging that the United Nations Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global response to climate change.













## Appendix D: Maps

### D.1: UN Regional Country Groupings

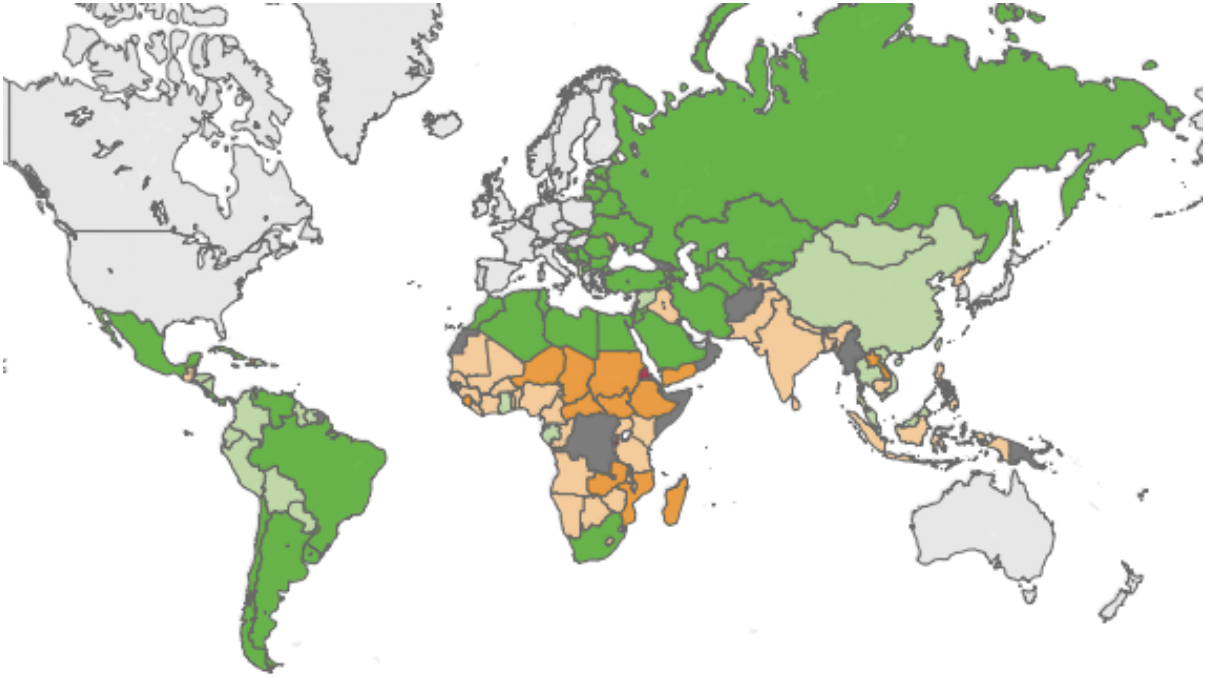
Source: UN. 2009. *The Millennium Development Goals Report*. United Nations, New York.



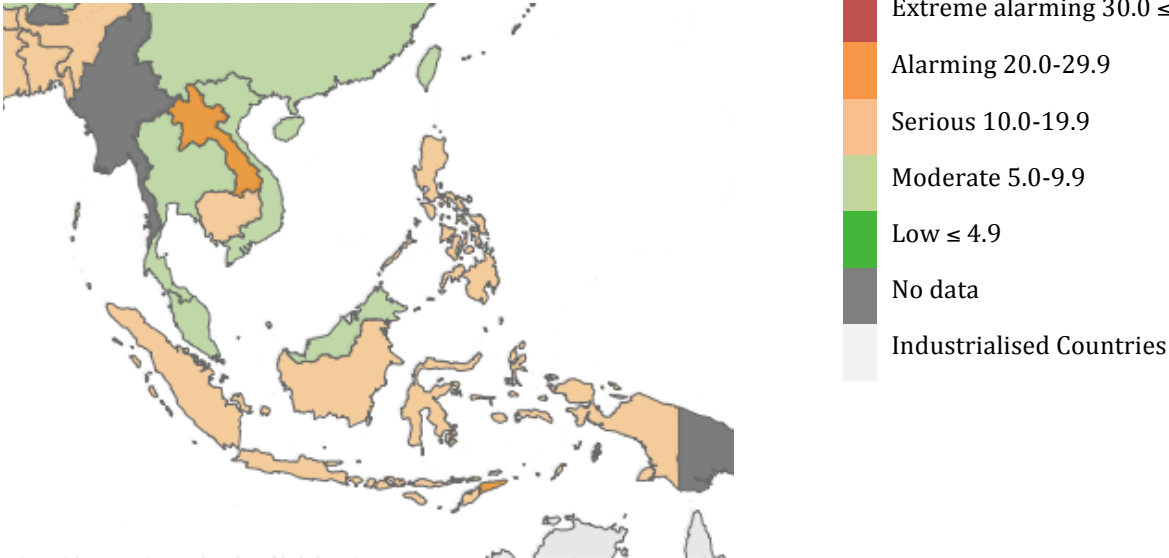
- |   |   |
|---|---|
|  Developed Regions   |  Oceania                         |
|  Countries of the Commonwealth of Independent States (CIS) |  Eastern Asia                    |
|  Northern Africa   |  Southern Asia                   |
|  Sub-Saharan Africa  |  Western Asia                    |
|  South- Eastern Asia                                       |  Latin America and the Caribbean |

D.2: Global Hunger Index (GHI) 2014

For individual developing countries.



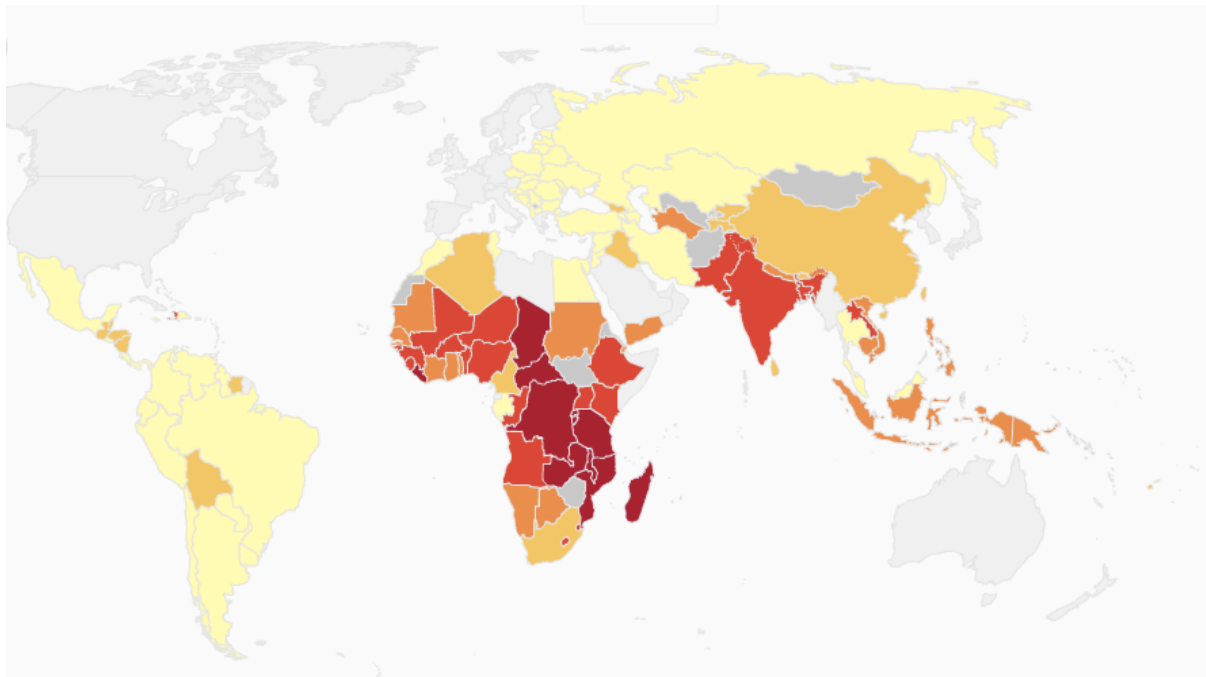
Close up: Southeast Asia



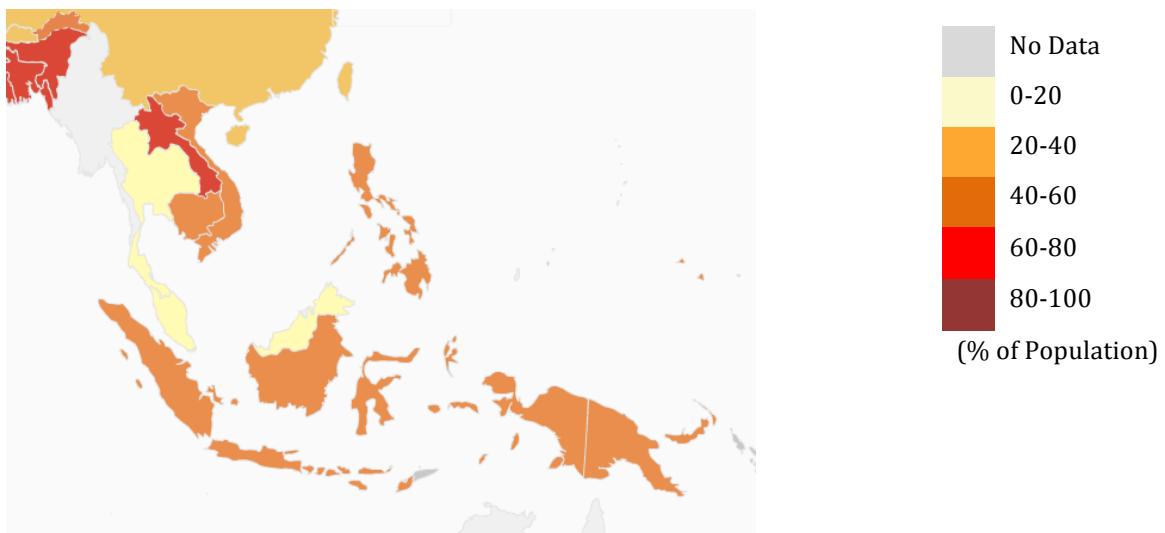
Source: IFPRI. 2014. *Global Hunger Index, Interactive Tool* [online], IFPRI. Available at: <http://www.ifpri.org/tools/2014-ghi-map> [Date: 2. June 2015].

### D.3: Poverty Head Count Ratio 2012

at \$2 a Day (PPP) (% of Population).



Close up: Southeast Asia.



Source: World Bank. 2015. *Poverty and Equity* [online], World Bank. Available at: <http://povertydata.worldbank.org/poverty/region/EAP> [Date: 2. June 2015].





## Appendix E: Hunger Statistics Southeast Asia

	Population 1990-92 (millions)	Number of Undernourished Persons (millions)	Prevalence of Undernourished Persons	Population 2012-14 (millions)	Number of Undernourished Persons (millions)	Prevalence of Undernourished Persons
Indonesia	181,8	35,9	19,7 %	249,8	21,6	8,7%
Vietnam	70,4	32,1	45,6 %	91,7	11,9	12,9 %
Philippines	63,4	16,7	26,3 %	98,4	11,3	11,5 %
Lao	4,4	1,9	42,8 %	6,8	1,5	21,8%
Brunei	---	---	---	---	---	---
Singapore	---	---	---	---	---	---
Timor- Leste	0,8	0,4	45,2%	1,1	0,3	28,8%
Thailand	57,1	20,4	35,7 %	67	4,6	6,8 %
Malaysia	18,7	1	5,1 %	29,7	---	< 5 %
Cambodia	9,4	3	32,1 %	15,1	2,4	16,1 %
Myanmar	42,8	26,8	62,6 %	53,3	8,9	16,7%

Source: FAO. 2015f. *Hunger Statistics* [online], FAO. Available at: <http://www.fao.org/hunger/en/> [Date: 28. April 2015].



## Appendix F: Poverty Head Count Ratio

at \$ 1,25 and \$ 2 a day (PPP) (% of population)

	\$ 1,25 a day		\$ 2 a day	
	1992-94	2010-12	1992-94	2010-12
Brunei	---	---	---	---
Cambodia	44,5	10,1	75,2	41,3
Indonesia	54,4	16,2	84,6	43,3
Lao	55,7	30,3	84,8	62,0
Malaysia	1,6	---	11,2	---
Myanmar	---	---	---	---
Philippines	30,5	19,0	55,2	41,7
Singapore	---	---	---	---
Thailand	8,6	0,3	30,1	3,5
Timor-Leste	---	---	---	---
Vietnam	63,8	2,4	85,7	12,5

Source: World Bank. 2015. *Poverty and Equity* [online], World Bank. Available at: <http://povertydata.worldbank.org/poverty/region/EAP> [Date: 2. June 2015].