INNOVATIVE APPROACH OF DEFINING FOCUSED PROBLEMS IN PURPOSE OF IDENTIFYING ATTRACTIVE ENTREPRENEURIAL OPPORTUNITIES IN THE MEKONG AREA

BY

MR. JONATHAN F. SIKLI

AN INDEPENDENT STUDY SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION (GLOBAL ENTREPRENEURSHIP) INTERNATIONAL MASTER IN BUSINESS ADMINISTRATION

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was approved as partial fulfillment of the requirements for
the degree of Master of Business Administration (Global Entrepreneurship)

on November 7, 2016

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Thesis Title	INNOVATIVE APPROACH OF DEFINING FOCUSED PROBLEMS IN PURPOSE OF IDENTIFYING ATTRACTIVE ENTREPRENEURIAL OPPORTUNITIES IN THE MEKONG AREA
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Academic Year	2016

ABSTRACT

This business research is an exploration of an innovative approach of defining focused problems, with the purpose of identifying attractive entrepreneurial opportunities, especially for social entrepreneurs and impact investors in the Mekong area. The objective is to test whether the Sustainable Developments Goals Framework could represent a good starting point in the identification of focused problems and if it could successfully attract social entrepreneurs and impact investors. The first part of the research aims to select which of the SDGs' target are the most likely to lead to focused problems while the second part of the research is an in-depth study of two selected targets. The analysis results in successfully defining two focused problems in the Mekong area as well as linking these problems to attractive entrepreneurial opportunities for social entrepreneurs and impact investors. Finally, the research could show that the SDG Framework could be good starting point to define focus problems that can lead to entrepreneurial opportunity even if it involves several limitations.

Keywords: Focused Problem, Entrepreneurial Opportunity, Impact Investing, Sustainable Development Goals, Social Innovation, Technological Innovation

ACKNOWLEDGEMENTS

First of all, I would like to take this opportunity to express my profound gratitude to James Edward Rubesch, Ph.D., who was my mentor during this business research. He introduced me to a lot of key topics related to this research and pushed me to explore outside of my comfort zone in order to learn and to develop both as an entrepreneur and as an individual. His suggestions and questions were unevaluable guidance to move forward and to achieve this business research.

I also wish to express my sincere appreciation to my advisor, Associate Professor Patnaree Srisuphaolarn, Ph.D., who guided me and provided me with tools and insights to conduct this business research methodically. Furthermore, her knowledge, experiences and expertise in writing academic papers, have been a precious source of learning and help to structure this research properly.

In addition, I am grateful to all the people who have contributed to my learning experience as an IMBA students. I am thinking about all the lecturers who have designed and provided interesting classes; my classmates who have shared with me the learning experience and have given to me pertinent feedbacks and warm encouragements; and also the staff working at the IMBA office and in charge of the administrative work, who have provided me with information, advices and help.

Last but not least, I wish to thank my parents and my brothers for their unconditional love and their moral support, as well as for the quality education they have provided me throughout my life. I also wish to thank my former teachers and employers in France and in Thailand who have been part of my education and personal development. Finally, I have a warm thought for the spiritual guides I have met all around the world and from multiple religions and philosophical movements, who have helped me to question my inner and outer world to become the individual I am.

Mr. Jonathan F. Sikli

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LIST OF ABBREVIATIONS

Abbreviations	Terms
CDC	Center for Disease Control and Prevention
GIIN	Global Impact Investing Network
ISCU	International Council for Science
ISSC	International Social Science Council
IT	Information Technology
LIGTT	Institute for Globally Transformative Technologies Lawrence Berkeley National Lab
MDGs	Millennium Development Goals
NVCA	National Venture Capital Association
Pre-SAC	Pre-School Age Children
PwC	PricewaterhouseCoopers
R&D	Research & Development
SAC	School Age Children
SDGs	Sustainable Development Goals
SDSN	Sustainable Development Solution Network
STH	Soil-Transmitted Helminths
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNGC	United Nations Global Compact
VC	Venture Capital
WASH	Water, Sanitation, and Hygiene
WHO	World Health Organization

CHAPTER 1
INTRODUCTION

1.1 Situation

Venture capitalists participate to the innovation effort via investing massively in new technologies through startups that intend to bring innovations into the market. If we look at the state of the Venture Capital market, it can be observed that the industry has been relatively flat in terms of number of deals over the past fifteen years, or since the end of the *Dot-com bubble* in 2001 (PwC & NVCA, 2016). Furthermore, Venture Capitals have always focused their investments towards specific industries to favor the development and the marketization of new technologies: Semiconductors in the 1970s, Computer Hardware in the 1980s, and Software since the 1990s (National Science Foundation, 2002). Nowadays, VCs focus their investments in the Software industry, which concentrate 41% of VC's deals while it used to represent only 25% of VCs deals in 1995. In addition, 75% of VCs deals are focused on 5 industries, and it is arguable that most of these deals are somewhat related to projects involving software development such as in Media & Entertainment, Biotechnology, IT services, and Consumer Products & Services industries. *(See Appendix A)*.

Thailand does not have a strong background nor a competitive edge in terms of developing software. Thai language on its own cannot represent a competitive advantage to secure the domestic market against international competition since software are by nature extremely flexible (add-on containing language packs could be rapidly developed and easily installed); and the quality of a software is highly dependable on the size of the user base, which provides valuable feedbacks to help developers to identify and resolve software bugs. In addition, it is impossible to predict which industry is going to be the next focus of VCs' investments in the future, and what is going to be the next flourishing market. As a result, it is extremely challenging for Thailand to attract private investors and to convince them

to invest in technological innovations and startups that will bring innovation into the market.

A pertinent alternative of bringing innovation into the market exist. It consists of defining unresolved problems (untapped markets) that are in need of solutions, instead of investing on solutions (technological innovation) that are looking for a problem to solve (a market). Therefore, the challenge is not anymore about betting on the right technologies; but it is on defining the right problems that could lead to attractive entrepreneurial and investment opportunities.

1.2 Research Objectives

The objective of this research is to bring a significant contribution in the exploration of an innovative way of defining focused problems at the regional scope, which could lead to attractive entrepreneurial opportunities, in order to convince entrepreneurs, investors, researchers and other stakeholders to work on resolving a specific problem rather than any other one.

1.3 Scope of the Research

To maximize the chance of defining problems that could appeal to both entrepreneurs and investors, the researcher intends to define problems that demonstrate market potential for scalable solutions, and that are focused enough to attract entrepreneurs and investor with expertise in a particular field, in order to mitigate the risks associated with new market development.

According to a recent publication of the United Nations (UNCTAD, 2015), the three key challenges of Thailand are: Economic, achieving growth and recover competitiveness to get the country out of the middle income trap; Social, achieving inclusive growth to reduce social disparities; Environmental, achieving a green growth to increase environmental friendliness. While the economic challenge is very specific to Thailand, the social and environmental challenges englobe problems that

are shared at the regional scope. Problems defined at the national level may fail to demonstrate an appealing market potential. However, social and environmental problems that are defined at the regional level of the Mekong area (Thailand, Vietnam, Myanmar, Laos, and Cambodia), which host over 235 million inhabitants, are more likely to attract Social Entrepreneurs and Impact investors, in order to capture a share of the growing impact investing market. The impact investing market is currently estimated at $77 billions of assets under management and is expected to reach $1 trillion by 2025. (GIIN & JP Morgan, 2016).

The rapidly growing impact investing market shows that investors are looking for impact investment opportunities. On the other side, a demand does exist. The Rockefeller Foundation estimates that the United Nations SDGs (Sustainable Development Goals) are facing a funding gap estimated at $2.5 trillions. The SDGs objectives align with those of Impact Investors. (Homi Kharas, 2015). As a result, this funding gap represents investment opportunities for impact investors.

Defining problems with significant market potential is determinant. However, this should be balanced with defining problems at a scope that is focused enough to attract entrepreneurs, investors, and other stakeholders who share a common interest and can bring their expertise to serve the co-creation of better solutions and business models. In other term, this would lead the development of ecosystems around problems, which can be defined as dynamic and co-evolving communities of diverse actors who create and capture new value through collaboration (Deloitte University Press, 2015). Developing better solutions via co-creation and serving an untapped market are together expected to significantly mitigate the execution risks and the market risks, which have been ranked as the top risks by impact investors (GIIN & JP Morgan, 2016). Furthermore, the findings from a research of the Financial Times confirms that the main barriers to the development of Impact investment are the lack of investment opportunities and the risk concerns (Financial Times, 2016).

Bringing all these pieces together, the researcher has focused the scope of this research on testing the two following hypotheses:

1. The SDG Framework can be used to formulate Focused Problems in order to attract Social Entrepreneurs and Impact Investors.
2. The SDG Framework can be a good starting point to define new Focused Problems that leads to attractive entrepreneurial opportunities.

1.4 Research Question

To orient the research within the limit of the scope defined above, the researcher has set the research question as:

"Could the SDG Framework be a starting point to define Focused Problems that represent attractive entrepreneurial opportunities for Social Entrepreneurs and Impact Investors in the Mekong area?"

CHAPTER 2
REVIEW OF LITERATURE

2.1 The SDG Framework

The SDG Framework consists of 17 goals, which entail 169 associated targets or quantitative and qualitative objectives across the social, economic, and environmental dimensions of sustainable development, that can be measured with dedicated indicators. *(See Appendix B)*. The SDGs are intergovernmental aspiration goals that were ratified by the United Nations in 2015 as the 2030 Agenda for Sustainable Development. These goals take the succession of the Millennium Development Goals (MDGs), which successfully contributed to human development over the past fifteen years. Compared to their predecessors, the SDGs are more detailed and aim both to improve human condition in the present, while protecting the environment to not jeopardize future generations ability to meet their needs. In additions, the SDG Framework encourages for shared action *"for people, planet and prosperity"* to be implemented by *"all countries and all stakeholders, acting in collaborative partnership."* (SDSN, 2015). This means that the SDG framework aims to be appealing to the private sector. Firstly, in order reach alternative sources of financing from international aids and domestic public financing. Secondly, in order to incite companies and entrepreneurs to develop business practices that no longer result in negative social and environmental consequences, as well as to encourage them to bring positive contributions to support creativity and innovation to solve the sustainable development challenges: *"Meeting the needs of the large and mostly untapped markets for products and services that can improve the lives of the four billion people who currently live in poverty"* (UNGC, 2016).

2.2 Wicked Problems

In 1973, Horst W. J. Rittel and Melvin M. Webber published a paper entitled *Dilemmas in a General Theory of Planning*. Their work constitutes a solid

source of learning to understand what are the characteristics of complex social problems, which they call Wicked Problems. In this research, we call Focused Problems the Wicked Problems that are defined at an optimal scope in order to represent an attractive markets and to attract entrepreneurs and investors with a specific field and area of expertise. A Wicked Problem is said to be "wicked" for several reasons. Firstly, the problem definition involves complexity (unclear cause and effect relationship), ambiguity (subject to personal judgement), and uncertainty (unpredictable outcome). Secondly, the problem is subject to equity issues. It involves different stockholders, which comprises plurality of objectives that make impossible to pursue unitary aims, and thus, to satisfy all. In consequence, it is challenging to set a proper goal formulation since it means establishing the discrepancy between the observed condition that is complex, ambiguous, and uncertain; and desired condition that involves plural and contradicting objectives.

2.3 Sonen Capital Impact Measurement Tool

Sonen Capital is an impact investment management firm located in San Francisco (California, United States of America). In its publication *Annual Impact Report 2015*, the firm presents its financial and impact performance, as well as its impact evaluation methodology. In the light of this research, it is interesting to analyze how Sonen Capital innovate via providing new impact measurement tools that aim to meet new considerations related to the type of impact that investors pursue. Their objective is to enable the asset owners to further express intentionally through the alignment of their resources and portfolio with a specific impact. In 2015, the impact investment firm has innovated by integrating the SDG Framework to its impact measurement methodology in order to create additional values for investors. Sonen Capital management team believes that the SDGs framework could fit well with their activity and has decided to use the SDG framework as a tool to demonstrate how their investment strategy leverage the creation of meaningful social and environmental impacts. This approach is interesting but retroactive. indeed, Sonen Capital only maps existing investments with the SDGs framework. However, it does not use the SDG Framework as a decision making tool or a discovery tool to find new

investment opportunities. In consequence, Sonen Capital appears as an analog in the context of this research, which aims to use the SDG Framework more proactively with the purpose of finding new entrepreneurial and invesment opportunities. However, Sonen approach tends to show that that the SDG Framework can be use in a way that creates value for investors.

2.4 50 Breakthroughs Study

In 2014, the Institute for Globally Transformative Technologies at the Lawrence Berkeley National Lab published a research entitled *50 Breakthroughs: Critical scientific and technological advances needed for sustainable global development*. The objective of this research is to provide to philanthropies, investors, business, entrepreneurs, technologies, and researchers a blueprint for where to invest their resources to achieve the highest impact. To do so, the research identify global challenges for witch new technologies are critical it order to produce a positive change and improve the life of million people. These technologies are said to be breakthroughs due to the fact that they are required to be dramatically different from existing technologies in industrialized settings: available at a fraction of the cost, requiring only a fraction of the energy, significantly less reliant on technical skills to operate, not needing elaborate infrastructure, and being generally robust and maintenance-free. This research is very interesting as it explores different general challenges in details (global health, food security and agricultural development, human rights, education, digital inclusion, water, access to electricity, gender equity, and resilience against climate change and environmental damage) in order to carefully identify what are the specific problems faced by people and then determines which technological innovation could solve these problems. As a result, these potential innovations would be both technological and social as they can answer a major problem and leverage significant positive impacts to people and the environment. In the context of this research, the *50 Breakthroughs* study appears as an analog and a source of inspiration for the researcher who intends to do something similar, at the scope of the Mekong area.

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Research Procedure

This research will follow a procedure that divides the research into two distinct phases as follow:

1.The first phase is a preliminary research that aims to identify which of the 169 targets from the 17 SDGs are the most likely to lead to focused problems and entrepreneurial opportunities, in the Mekong area.

2.The second phase in an in-depth research that focuses on one or two SDG's targets that have been selected in the preliminary research, with the objective of understanding the general challenge that these targets address, and then to identify one or more focused problems and the entrepreneurial opportunities they lead to.

3.2 Phase 1: Preliminary Research

The key objective of the preliminary research is to provide a starting point for the in-depth research. The researcher has developed a funnel of successive steps that constitute the preliminary research, in order to identify which of the SDGs' targets are the most likely to lead to focused problems and attractive entrepreneurial opportunities in the Mekong area.

3.2.1 Step 1: Gap Analysis

The objective of conducting a gap analysis is to identify which of the SDGs demonstrate strong potential for improvement and social and environmental impact, since it has been shown that one of the key attribute of a social opportunity is its prevalence of need in the human society (Zahra, A. et al., 2008). A gap is measured by the difference between the desired situation, which is expected to be clearly formulated in the statement of the SDGs and their targets; and the current

situation, which needs to be computed. The researcher expects that the gaps, which represent potential for change, could ultimately lead to identifying focused problems, which could then be defined via a thorough analysis of the root causes and obstacles that are currently preventing from closing the gap to reach the desired situation.

In order to assess the current situation in the Mekong area relative to the SDGs, the researcher intends to retrieve the official indicators that have been agreed on by the United Nations and the official databases provided by the United Nations and the World Bank. Then the researcher will compute the result for each indicator in order to obtain a clear view of the current situation in Mekong area. Afterward, the researcher will contrast the current situation with the objectives stated in the SDGs' targets in order to understand the current state of achievement for targets composing each of the SDGs. This will ultimately lead to identifying gaps. The wider the gap the higher the potential for change and the prevalence of need in the human society.

3.2.2 Step 2: Identification of potential targets of focus

The researcher expects that the 169 targets will not be equally appealing for the private sector. As a result, the researcher intends to skim to focus only on targets that present the three following characteristics:

1. Appeal by design to the private sector as agent of change
2. Potential for improvement in the Mekong area
3. Available data beyond the official indicators and database

3.2.3 Step 3: Survey to select the targets of focus

The previous steps have reduced the choice to few targets that seem to be the most likely to lead to focused problems and attractive entrepreneurial opportunities for social entrepreneurs and impact investors. The research intends now to collect external perspectives in order so select the targets that will direct and focus the effort of the researcher to conduct an in-depth analysis.

3.2.3.1 Rapid and quantified problem formulation

The survey consists of a series of briefly defined and quantified problems that emanate from each of the potential targets of focus selected at the previous step on the preliminary research. These problems are defined in a short paragraph with data as rapid prototypes of what could be developed in the in-depth research. Respondents are requested to evaluate the entrepreneurial attractiveness of each of the problems on a 0 to 5 rating scale. *(See appendix C).*

3.2.3.2 Collecting response from entrepreneurs and investors

The survey has been elaborated online with Google Survey, and submitted to social entrepreneurs and impact investors, via leveraging on social networks groups that gather people who share a common interest for social and environmental impact. In the end, the researcher will use the weighted average technique to evaluate the score of each problems and select one or two targets that will become the topic of interest of the in-depth research.

3.3 Phase 2: In-depth Research

To conduct the in-depth research, the researcher plans to follow a similar methodology and even to borrow some findings of the *50 breakthroughs* study, but to adapt it to the specificity of the regional problem selected in the Mekong area.

3.3.1 General Problem

The starting point of the in-depth research is the outcome of the preliminary research and consist of one or two targets of a single SDG. The selected SDG and its targets have been designed to tackle a global challenge. The researcher intends to briefly define this challenge, and to provide general understanding about it via exploring existing literature and identifying the negative social and environmental impacts of the problem. Once the general issue has been identified and understood. The researcher plans to collect meaningful data in order to quantify the negative social and environmental impacts of this problem in the Mekong area, which would aim to give an idea of the importance of the problem for the region. Afterwards, the researcher intends to identify and understand the causes of these negative impacts. It

is expected that the understanding, at least partial, of several cause and effect relationships, could lead to the identification of one or more focused problem.

3.3.2 Focused Problems

As pointed out in the research *Dilemmas in a General Theory of Planning*, a Wicked Problems, which is a complex and dynamic social problem, is a symptom of another problem. This also means that a Wicked Problem is a part of a bigger problem and contain smaller problems. As a result, the challenge is to determine at which level a problem should be defined. The general problem is expected to be broad and unmanageable but to give a general idea of a challenge by providing a big picture perspective. Some of its root causes are expected by the researcher to lead to problems that more focused into a specific field, while remaining problems that are big enough to represent attractive markets. Once, one of these focused problems is identified, the researcher plans to quantify the problem and to explore different ways of defining the problem, such as assessing the problem in rural and urban areas, where the causes of the problem and obstacles to its resolutions might be different.

3.3.3 Entrepreneurial Opportunities

The researcher expects to find entrepreneurial opportunities in analyzing focused problems and identifying the obstacles that prevent from reaching a better situation. If these obstacles can be removed or their negative outcomes lowered by doing things differently via the development of innovative models and solutions by private change agents. Therefore, there are entrepreneurial opportunities for social entrepreneurs and impact investment opportunities for impact investors. The researcher intends to use the *50 breakthroughs* study to suggest some technologies that could be developed and integrated in innovative business models to resolve or contribute to the resolution of identified focused problems.

CHAPTER 4
RESULTS AND DISCUSSION

4.1 Phase 1: Preliminary Research

4.1.1 Step 1: Gap Analysis

4.1.1.1 Evaluation of the current situation

The current situation in the Mekong area relative to each SDG was computed via using the official indicators agreed on by the United Nations to measure each targets and the official database provided by the United Nations and the World Bank. The findings are summarized in the table below. The mention "No Information" means that no evaluation could be made either because the United Nations failed to agree on indicators to measure the situation or because the official databases failed to provide any recent data to measure the current situation in the Mekong area.

Table 4.1: Gap Analysis, Observation of the current situation in the Mekong area

	Goals	Key Observations

1	No poverty	• 5.5M people under poverty at international poverty line
		• 24M people under poverty line at national poverty line
		  ○ 20M are located in rural areas
		  ○ 18% of people in rural areas are poor

2	No hunger	• 26M people suffer from undernourishment • Proportion of stunted children is very high
3	Good health	• Low proportion of birth attended by skilled health personnel • High infant, under-five, and neonatal mortality rate • High HIV incidence rate • High rate of death due to traffic injuries • High mortality due to ambient air pollution • High mortality due to unsafe sanitation and lack of hygiene
4	Quality education	• Low participation rate in organized learning one year before the official primary entry age
5	Gender equality	• High proportion of women married by age of 18 • Low proportion of seats held by women in national parliaments
6	Clean water and sanitation	• Low proportion of access to improved sanitation facilities • Low proportion of access to improved source of drinking water

7	Renewable energy	• Low proportion of access to electricity
8	Good jobs and economic growth	• GDP growth under the objective of 7%
9	Innovation and infrastructures	• Transportation infrastructure needs to be more developed • Manufacturing value added is still too low
10	Reduced Inequalities	• Reinforcement of inequalities as income per capita raise more for the top 60% of the population than for the bottom 40%
11	Sustainable cities and communities	• Almost the totality of the population are exposed to PM2.5 air pollution levels exceeding the guidelines set by the WHO
12	Responsible consumption	*No information*
13	Climate action	*No information*
14	Life bellow water	*No information*
15	Life on land	• Deforestation needs to be control and fought • More area must be protected in order to cover important sites for biodiversity (freshwater, terrestrial, and mountain) • Red list index needs to be monitored and kept high
16	Place and justice	• Bribery incidence is very high • Lots of birth are not registered with a civil authority
17	Partnerships for the goals	*No information*

4.1.1.2 Issues faced in identifying gaps

While attempting to conduct a gap analysis, the researcher faced several obstacles at different level that has prevented from Identifying gaps that could lead to attractive focused problems on which social entrepreneurs and impact investor could work on:

1. **Issue to measure the current situation**: Firstly, this issue is partially inherent to the current design of the SDG framework. Indeed, the United Nations have failed to agree on indicators to measure the situation and monitor progress for many of the SDGs' targets. Secondly, this issue is more specific to the analysis of the Mekong area. Indeed, several targets are equipped with indicators. However, updated data could not be retrieved on the official database provided by the United Nations and the World Bank. When a target has either no indicators or no available updated data it is impossible to measure the current situation, and thus to conduct a gap analysis.

2. **Issue to identify clear objectives**: Numerous targets are stated in a way that is too broad and general, and with no clear objective that could be measured quantitatively and within a specific timeframe. This observation tends to confirm that only 29% of the SDGs' targets could be considered well developed (ICSU & ISSC, 2015). When a target is not properly defined, it is impossible to comprehend what is the desired situation, and thus to conduct a gap analysis.

3. **Issue to appeal to the private sector**: Many SDGs' targets fail to identify and to appeal to change agents other than governments and international institutions. As a result, these targets could not possibly lead to focus problems that could represent attractive entrepreneurial opportunities for social entrepreneurs and impact investors.

4.1.2 Step 2: Identification of potential targets of focus

Leveraging on what have been learnt at the previous step, the researcher skimmed the SDGs' targets to focus on the targets that meet the three following characteristics:

1. Appeal by design to the private sector as agent of change
2. Potential for improvement in the Mekong area
3. Available data beyond the official indicators and database

This thorough analysis led the researcher to identify 6 potential targets of focus across 3 different SDG, which seem to hold strong potential to lead to focus problems in the Mekong area that are likely to lead to attractive entrepreneurial opportunities:

Table 4.2: Potential targets of focus

Goals		Potential targets of focus
6	**Clean water and sanitation**	• **Target 6.1**: by 2030, achieve universal and equitable access to safe and affordable drinking water for all. • **Target 6.2**: 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.
7	**Renewable energy**	• **Target 7.1**: by 2030 ensure universal access to affordable, reliable, and modern energy services. • **Target 7.2**: increase substantially the share of renewable energy in the global energy mix by 2030.
11	**Sustainable cities and communities**	• **Target 11.3**: by 2030 enhance inclusive and sustainable urbanization and capacities for participatory, integrated and sustainable human settlement planning and management in all countries. • **Target 11.6**: by 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality, municipal and other waste management.

4.1.3 Step 3: Survey to select the targets of focus

A survey was conducted with the purpose of gathering external perspectives from social entrepreneurs and impact investors, in order to select one or two targets that could be explore further in the in-depth research. *(See Appendix C)*.

4.1.3.1 Survey Sample

The sample used for this survey consists of 31 people who have responded to the survey online via clicking on a link placed social networks such as Facebook, Line, and LinkedIn. Most of them are entrepreneurs (77%) and are located in the Mekong areas (81%). It can be noted that only 13% of the respondents are investors, and all of them are located in the United States of America.

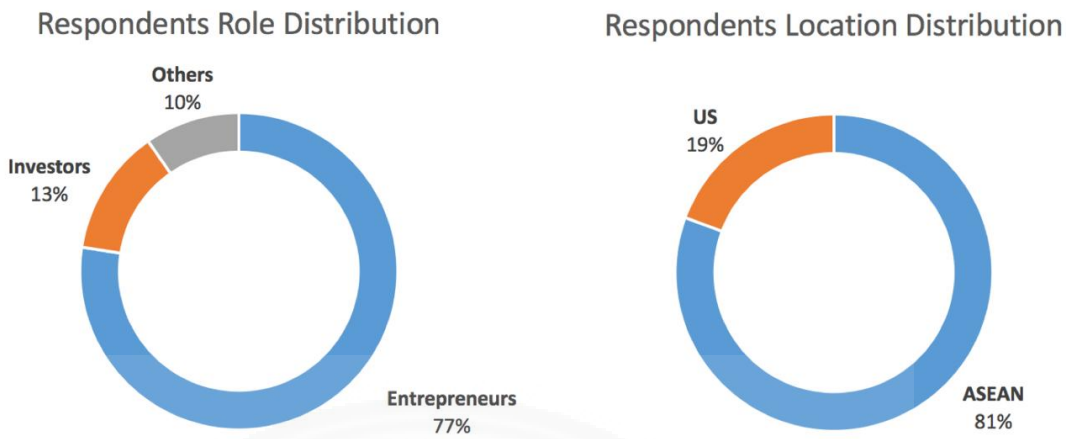

Figure 4.1 Survey sample, Respondents role and location distribution

4.1.3.2 Survey Results

The results have been computed with the weighted average technique to give a score to each of the six problems. Afterwards, the problems have been ranked from the top score to the lowest one. It can be observed that the problems that emanate from the targets 6.1 and 6.2 rank first and second. Since these targets belong to the same SDG (Clean water and Sanitation) and are expected by the researcher to be interconnected, they have been selected to be the targets of focus of the in-depth research.

Table 4.3: Survey result, Table

Opportunities	Rating Scale					Average	Rank
	1	2	3	4	5		
6.1 Drinking Water	0	5	7	11	8	**3.71**	**1**
6.2 Sanitation	0	5	10	13	3	**3.45**	**2**
7.1 Access to Energy	2	4	14	9	2	**3.16**	6
7.2 Renewable Energy	0	5	17	5	4	**3.26**	4
11.3 Urban Settlement	1	5	11	8	6	**3.42**	3
11.4 Organic Waste	0	8	12	6	5	**3.26**	4

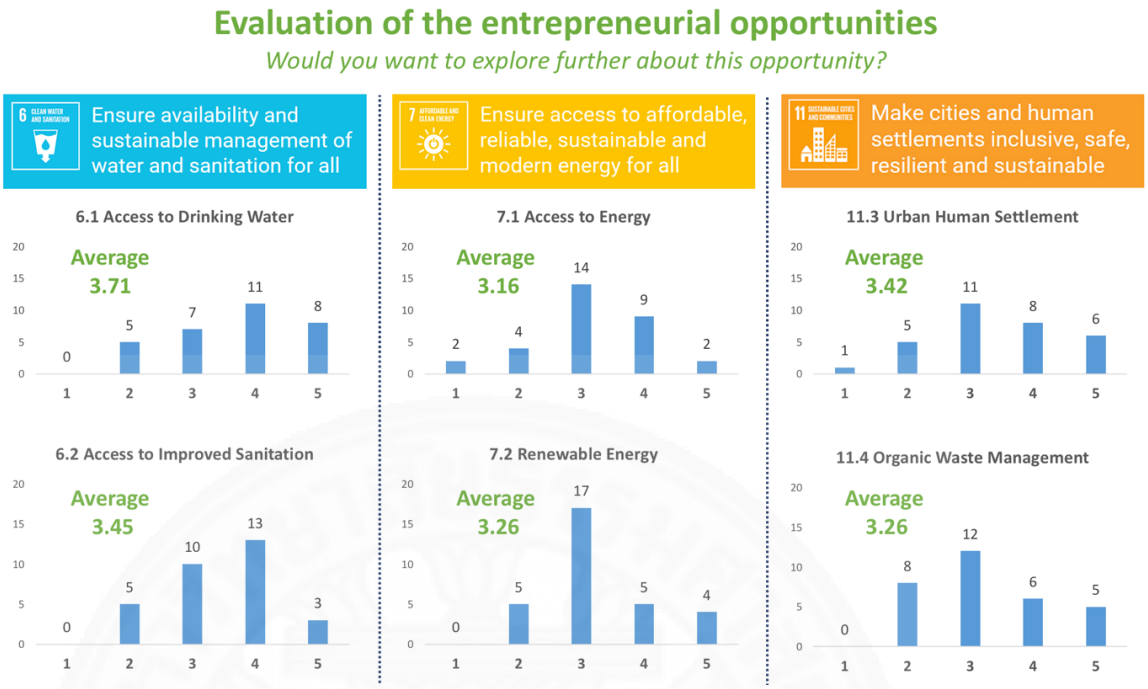

Figure 4.2 Survey result, Bar chart

4.2 Phase 2: In-depth Research

4.2.1 Statement of the starting point

The result leveraged from the preliminary analysis have encouraged the researcher to focus on the two following targets that are expected to provide room for potential improvement, and impact in the Mekong Area. Furthermore, these targets are designed to be workable by the private sector, and thus could lead to entrepreneurial opportunities for Social Entrepreneurs as well as investment opportunities for Impact Investors. Furthermore, an abundant amount of data could be retrieved by the researcher in order to conduct a qualitative analyze while providing quantified fact that help to understand the problem and its prevalence of need in human society.

Table 4.4: Targets of focus – SDG6, Targets 6.1 and 6.2

SDG6 – Clean Water & Sanitation *"Ensure availability and sustainable management of water and sanitation for all"*	
Target 6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all	**Official Indicator** Proportion of population using safely managed drinking water services
Target 6.2 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	**Official Indicator:** Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water

These 2 targets concern the issues related to water supply and water quality which impact millions of individuals and communities. Firstly, there is a dramatic impact on the health of people located in geographic area affected by these issues, 88% of diseases in the developing world are caused by unsafe drinking water, inadequate sanitation or insufficient hygiene (World Bank). Secondly, there is an impact on education. Improving education standards in the developing world has been proven to be dependent upon access to safe drinking water. Finally, these issues involve direct and indirect economic burdens such as the costs of contracting and treating a disease, the reduced productivity caused by the diseases, or even the cost attributed to the time spent for water collection. (HaloSource, 2009).

4.2.2 General Problem: WASH diseases impacts in the Mekong area

WASH diseases (Water, Sanitation, and Hygiene) are still a major cause of mortality in the Mekong Area, which especially affects the most vulnerable layer of the population, the children and particularly the under-five years old. There is a strong relationship between diarrhea symptoms and waterborne diseases. Indeed, according the World Health organization in its publication entitled *Safer water, better health*, most waterborne diseases cause diarrheal illness, while 88% of diarrhea cases worldwide are linked to unsafe water, inadequate sanitation or insufficient hygiene. (WHO, 2008).

4.2.2.1 Deaths from diarrheal diseases

The World Health Organization defines diarrhea as the passage of three or more loose or liquid stools per day. Diarrhea is usually a symptom of an infection in the intestinal tract that is caused by a variety of pathogens such as bacteria, viruses and parasitic organisms. Infection spreads via contaminated food or drinking-water, or from person-to-person as a result of poor hygiene.

Diarrheal diseases caused more than 23,000 deaths in the Mekong area in 2013. Myanmar account for almost half of this number. The aged standardized death rate (per 100,000 population) from diarrheal diseases is also an interesting indicator since it helps to identify the countries where the situation is the most critical in proportion to their population. It can be observed that the situation is especially serious in Laos and Myanmar where there are more than 25 deaths per 100,000 people. (WHO, 2013).

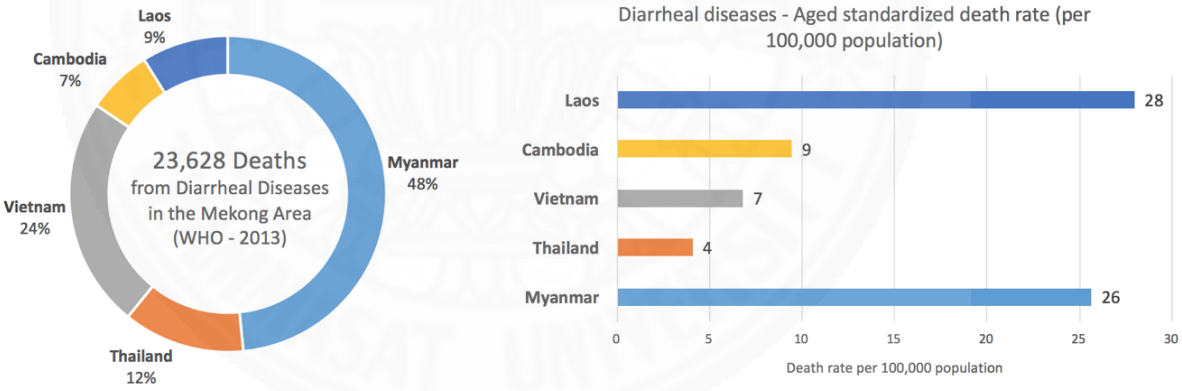

Figure 4.3 General Problem, Death from diarrheal diseases in the Mekong area in 2013

Under-5 years old children are the most sensitive to diarrheal diseases. This segment of the population accounts for almost half of the total number of death from diarrheal diseases in the Mekong area. Furthermore, it can be observed that diarrheal diseases are the second cause of post neonatal death in the region, which represent one death of under-5 out of five.

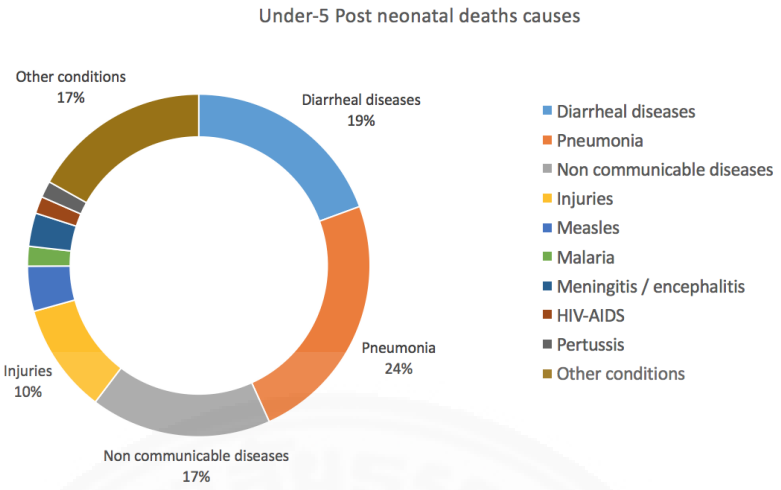

Figure 4.4 General Problem, under-5 post neonatal causes of deaths in the Mekong area

4.2.2.2 Soil-transmitted Helminths (STH) infections

Soil-transmitted helminths are worm parasites which are transmitted via soil contaminated with fecal matters. STHs develop in the host organism by feeding themselves with blood and competing with the host for nutrition. As a result, STH infections lead to absorbing less nutrients, which cause weakness and malaise. In addition, it also causes a loss of appetite that reduces nutritional intake and leads to diarrhea and even dysentery. Furthermore, STH infection can have a dramatic impact on children cognitive and physical development. (WHO, 2016).

A document provided by WHO *(See Appendix D)* shows the proportion of children requiring Preventive Chemotherapy for soil-transmitted helminthiases in 2014. It can be observed that South Asia represents the second site of infection after Sub-Saharan Africa. If we look more specifically at the Mekong area, we can see that Myanmar, Laos, and Cambodia are ranked as High, which mean that over 2 third of children require Preventive Chemotherapy; Vietnam is ranked as Moderate, which mean that one third to 2 third of the children require Preventive Chemotherapy; finally, in Thailand Preventive Chemotherapy is not required for children. The WHO database evaluates the number of children requiring preventive chemotherapy for STH to reach over 28 million children in the Mekong area. Myanmar and Vietnam together account for almost three quarter of this number.

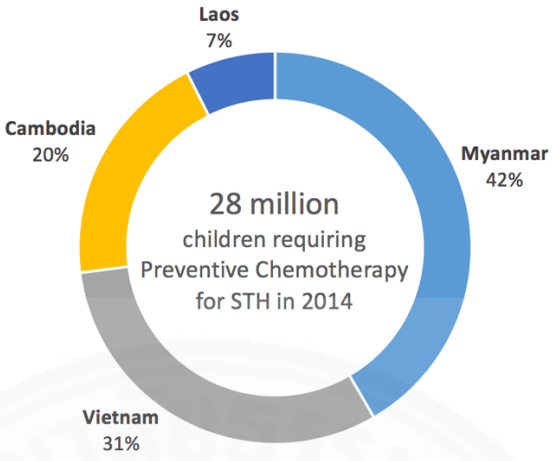

Figure 4.5 General Problem, Children requiring preventive Chemotherapy for STH in the Mekong area in 2014

4.2.2.3 Malnutrition

WASH diseases such as diarrhea and STH infections especially affect children. Their side effects can lead to both: malabsorption of nutrients, and a decreased of appetite, meaning a decrease of nutrients intake. As a result, WASH disease directly impair to the physical and cognitive development of children. By analyzing the data provided by the World Bank, it can be observed that there are almost 5 million under-5 years old children suffer from stunting in the Mekong area in 2014. Stunting is defined by the World Health Organization as the process of failure to reach linear growth potential as a result of suboptimal health and/or nutritional conditions.

It can be seen that Myanmar and Vietnam show the highest number of under-5 years old children suffering from stunting. These two countries are also the countries where we could observe the highest number of death from diarrheal diseases and the highest number of children requiring Preventive Chemotherapy for STH.

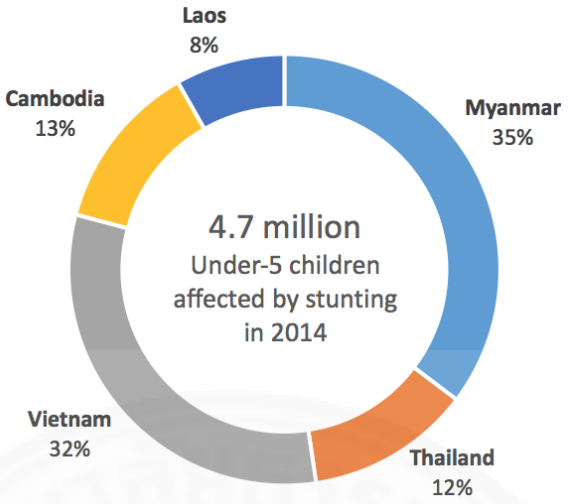

Figure 4.6 General Problem: Under-5 children affected by stunting in the Mekong area in 2014

4.2.3 General Problem: Causes of WASH diseases in the Mekong area

Diarrheal diseases contaminate people when they are exposed to pathogens (bacteria, viruses and parasitic organisms) contained in fecal matters, which are released in the environment. The spreading of pathogens and contamination of people process is summarized in the *Fecal-Oral Pathogen Flow Model (See Appendix E)*, which identify five distinctive critical stages:

1. **Pathogen hosting**: Individuals who carry pathogens are not necessary infected. However, within their organism the pathogens will grow and replicate.

2. **Defecation points**: These represent the points where the fecal matters that carries pathogens are released by individuals. These points host a very high density of pathogens (fields, pit latrines, sewers…).

3. **Transfer pathways**: When sanitation systems are not adequate or developed well enough, pathogens are then spread in the environment, mostly in the various source of water (Surface, ground, pipes).

4. **Exposure**: It has been identified that pathogens get within human via: Drinking water, exposed to pathogens at the source, in transit (pipes), or once stored at the household; Food, which can be exposed to pathogens during crops cultivation (irrigation, fertilizers), in the market, at home (Cooking, eating, flies); Hands, which could be exposed to pathogens during defecation, when caring for an infant, and through touching the soil and the environment.

5. **Infection**: Individual suffering from WASH diseases host pathogens and release them more often in the environment due to their diarrhea condition.

Besides, this flowchart highlights that the WASH diseases could be reduced significantly either by:

1. **Reducing the release of pathogens in the environment**: This point is explained in the step 2 of the flowchart, "defecation points", and could be linked to the Target 6.2 of the SDG Framework that aims to *achieve universal access to improved sanitation and hygiene*.

2. **Minimizing the exposure of people to pathogens**: This point is explained in the step 4 of the flowchart, "exposure", and could be linked to the Target 6.1 of the SDG Framework that aims *to achieve universal and equitable access to safe and affordable drinking water*.

4.2.4 Focused Problem 1: Low access to improved sanitation increases the contamination of the environment with WASH pathogens

As analyzed in the *Fecal-Oral Pathogen Flow Model*, the defecation point is critical issue since inadequate defecation point and poor management fecal matters lead to the contamination of the environment by pathogens, which in terms multiply the chance of human contamination.

Improved sanitation facilities are defined by the WHO as the facilities that separate human excreta from human contact and guarantee some standard of hygiene. According to the World Bank, improved sanitation facilities include the following: Flush/pour flush (to piped sewer system, septic tank, pit latrine); Ventilated improved pit latrine; Pit latrine with slab *(See Appendix F)*; Composting toilet.

In the Mekong area, 20% of the population or over 46 million people do not have access to improved sanitation facilities in 2015. (World Bank, 2015)

4.2.4.1 Access to improved sanitation in rural areas

More than 80% of people with no access to improved sanitation are located in rural area, which totalize a number of 38 million people (26% of the rurality) who mostly come from Vietnam, Cambodia, and Myanmar. A third of these people (12 million people) practice open defecation. These are mostly located in Cambodia, Myanmar, and Laos. Open defecation engenders multiple risks such as the contamination of surface water, ground water, soil, and even crop that will be later on consumed by human beings. In addition, defecating outside proper toilets is associated with a lack of hygiene since people cannot properly wash and disinfect their hands, which multiply the risks of exposure to pathogens.

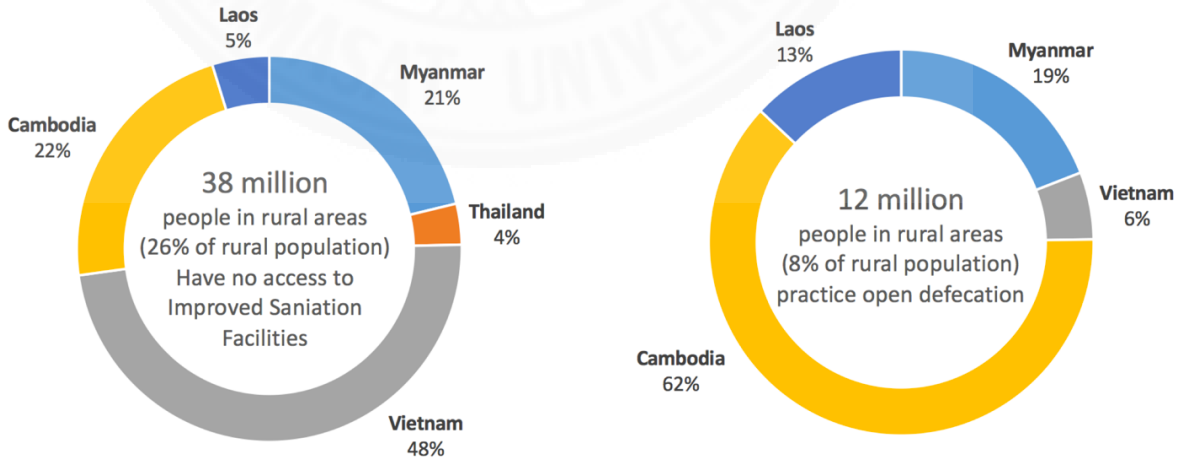

Figure 4.7 Focused Problem 1, People with no access to improved sanitation & open defecation, in rural areas of the Mekong area in 2015

4.2.4.2 Access to improved sanitation in urban areas

One person out of ten living in urban area, or 8.5 million people, do not have access to improved sanitation in the Mekong area. These people often use public and shared toilets that usually lack of proper hygiene, enhancing the chances of contamination. In addition, the fecal matters are often mismanaged and improperly released in the environment, contaminating surface and ground water, as well a soil. It is interesting to compare the distribution of urban people having no access to improved sanitation in the region, with the distribution of urban people living in slum in the region. Indeed, we can see that the distribution follows a similar pattern, which could be interpreted as most of the urban people with no access to improved sanitation are living in slums. Besides, it is common that people living is slums have no access to piped water and closed sewerage, and have limited space and resource to equip their house with proper toilet.

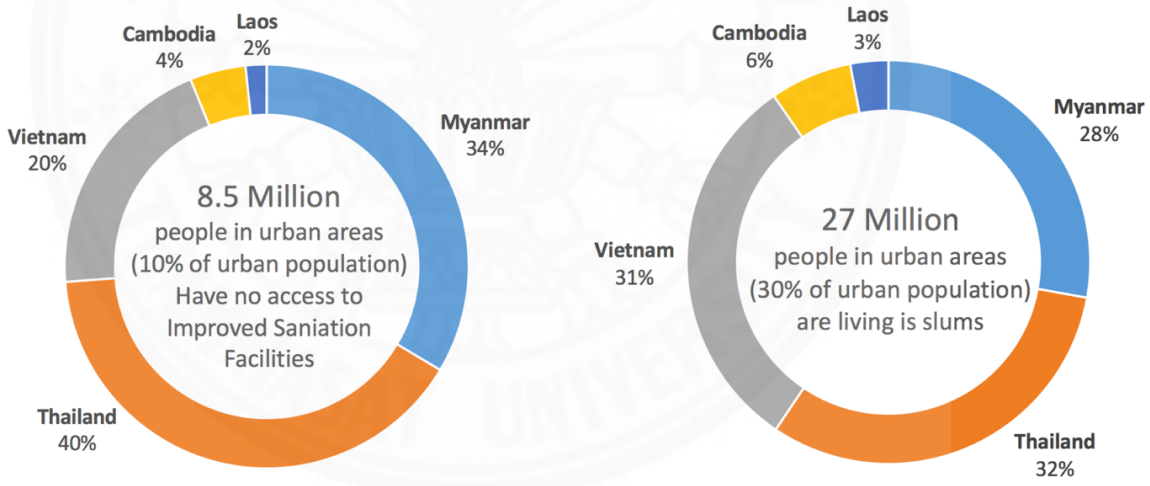

Figure 4.8 Focused Problem 1, People with no access to improved sanitation & people living in slums, in urban areas of the Mekong area in 2015

4.2.4.3 Entrepreneurial opportunities in wastewater treatment

There are limited data available about wastewater treatment for the countries of the Mekong area. But even Thailand that shows the highest rate of population with access to improved sanitation in the region is not effective in terms of water treatment. Indeed, Bangkok and its five neighbor provinces are estimated to produce 3.05 million cubic meters of wastewater per day but to treat only 40% of this

amount. (International Trade Administration, 2016). If Bangkok megalopolis is performing so bad, the situation must be even more challenging at the regional level for treating wastewater prior to release it in the environment in order to minimize the environmental contamination and human infections. This issue lead to the opportunity for entrepreneurs to develop new models that could improve the capacity and reach of the current sewerage and treatment facilities. These new model would reduce the amount of improper water released in the environment and contaminating surface and ground water.

4.2.4.4 Entrepreneurial opportunities in sustainable models of toilets

The main challenge associated with toilet solutions is their maintenance. Indeed, if toilets are not kept clean and the fecal waste removed regularly, then people would stop using them and opt for other defecating points. This issue could lead to the opportunity for entrepreneurs to develop financially sustainable and scalable models that properly manage fecal wastes and keep the toilets in a proper hygienic state. Often, fecal maters are simply ditched somewhere in the environment, where they contaminate surface water, ground water, soil, and increase the chance of transmitting pathogens to human beings, especially children.

In the urban areas, developing better toilet solution is tightly linked to the challenge of developing inclusive and sustainable human settlement. As pointed out previously in this analysis, most people living in slums do not have access to piped water supply and closed sewerage. As a result, they usually develop systems that use pit latrines and release their wastes in open sewerage, which lead to several problems. Firstly, the countries located in the Mekong area are subject to tropical monsoon from June to November. During this period, there are heavy rains that regularly cause flood episodes, where water fills open sewers that outflank causing widespread contamination of areas with high density of inhabitants. Secondly, in urban areas with high concentration of people, pit latrines toilets habitually fill up at a faster rate than the fecal matters could break sown. As a result, toilets must be emptied or new toilet need to be build. Usually, wastes are disposed improperly in nearby inhabited area, where they contaminate water source and soil.

In rural areas, people are usually using pit latrines or practice open defecation. Similarly, to what has been explained for the case of urban areas, flood episodes tend to widespread contamination to water source and soil, which contaminate the water people drink but also the crops that are cultivated.

Opportunities exist for entrepreneurs in developing models that would recycle fecal wastes into valuable input that could be sold and provide return on investment. This could contribute in resolving the problem of disposing improperly fecal sludge collected from palatine and that pollute the environment. According to the Institute for Globally Transformative Technologies, fecal waste could be converted into: energy (biogas, biofuel, and electricity); high value compounds (compost, fertilizer, and plastic); and harvesting nutrients. In addition, entrepreneurs could take into account the need of poor people living in urban areas to have in-home toilets that take a minimum of space, are durable and easy to clean, can be used without access to piped water supply and sewer, and could prevent the diffusion of odors in the rest of the house; while coping with the challenge of developing toilets from which wastes could be easily collected in purpose of being used as previously explained.

4.2.5 Focused Problem 2: Low access to improved source of drinking water increases human exposure to WASH pathogens

The Fecal-Oral Pathogen Flow Model points out that the exposure to pathogen is done via the use or consumption of contaminated water, the consumption of contaminated food, and the lack of hygiene. Contaminated water is the most important factors since water is needed to drink, to wash the food, and to achieve an acceptable level of personal hygiene.

Improved drinking water source is defined by the WHO as a source that, by nature of its construction, adequately protects the water from outside contamination, in particular from fecal matter. According to the World Bank, improved drinking water source include the following: piped water on premises

(piped household water connection located inside the user's dwelling, plot or yard); public taps or standpipes; tube wells or boreholes; protected dug wells; protected springs; and rainwater collection.

In the Mekong area, there are around 20 million people who still do not have access to improved water source, which represent over 8% of the total population (World Bank, 2015). These people are thus lacking of drinking water, which according to the WHO commonly used for domestic purposes (Drinking, cooking, and personal hygiene).

4.2.5.1 Access to improved source of drinking water in rural areas

More than 85% of people with no access to improved drinking water source are located in rural area, which totalize a number of 17 million people (11.5% of the rurality) who mostly live in Myanmar, Cambodia, and Vietnam.

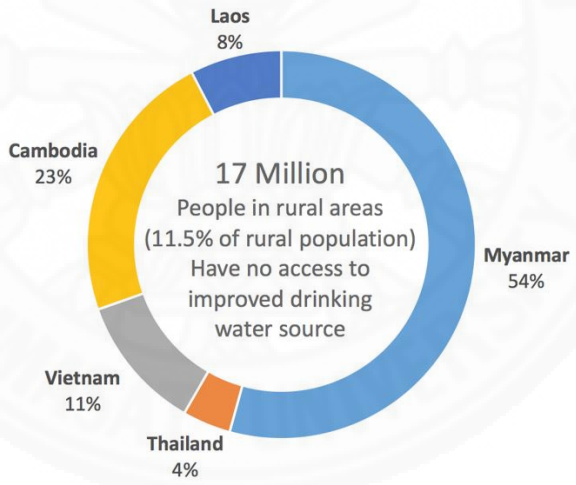

Figure 4.9 Focused Problem 2, People with no access to improved drinking water source, in rural areas of the Mekong area in 2015

4.2.5.2 Access to improved source of drinking water in urban areas

Only 3.2% of the urban population does not have access to improved drinking water source. This totalize a number approaching 3 million people. More than three quarters of them come from Myanmar and Thailand. We can notice that this number could raise in the future as the proportion of people living in urban area increases yearly in the region. For instance, the Thai urban population passed the

50% symbolic mark for the first time in 2015, which means that nowadays there are more urban than rural people in Thailand. In Myanmar and Vietnam, the urban population represent a third of the total population, but it is growing.

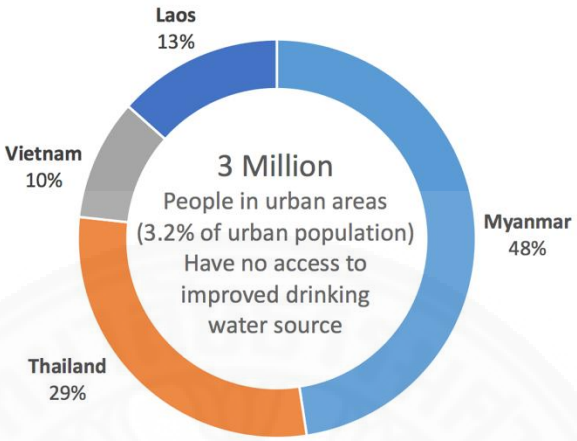

Figure 4.10 Focused Problem 2, People with no access to improved drinking water source, in urban areas of the Mekong area in 2015

4.2.5.3 Entrepreneurial opportunities in water purification

In 2014, the countries of the Mekong area withdrawn 178 billion cubic meters of freshwater that where mostly used for agriculture (92%) but also by the industrial sector and for domestic usage (4% each). This represents a total withdrawal of 755 cubic meters of water per capita, which is less that what could be observed in North America, but higher than per capita withdrawal of the European Union, world average, or poor areas such as South Asia and Sub-Saharan Africa.

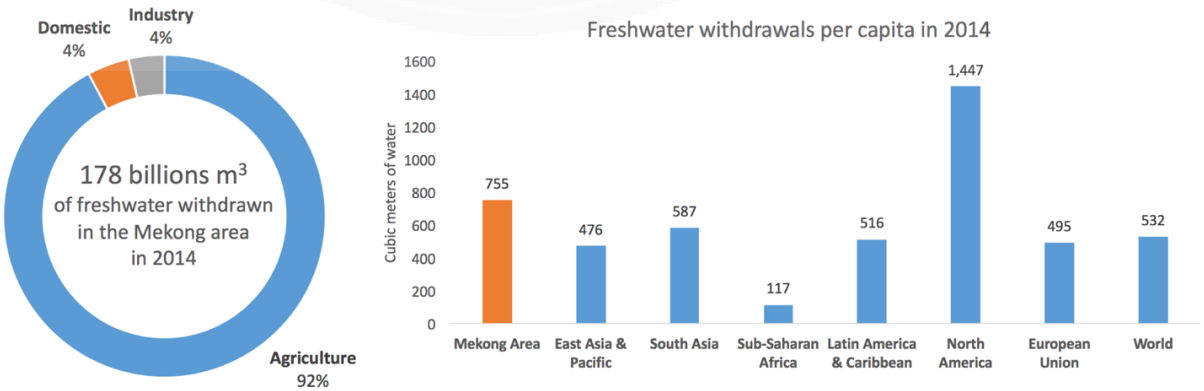

Figure 4.11 Entrepreneurial opportunities, Freshwater withdrawal in the Mekong area in 2014

Furthermore, it can be observed that every countries of the Mekong area have more renewable internal freshwater resources per capita than needed to meet the national consumption. Thailand and Vietnam are withdrawing around a quarter of their internal resources each year which remains at a healthy level. Myanmar, Laos and Cambodia are the countries where the access to improved source of water is the lowest in rural area. However, these countries show the highest renewable freshwater per capita and withdraw only from 2% to 3% of their internal freshwater resource per year. As a result, it can be concluded that the Mekong area is not suffering from freshwater scarcity and that the region has the potential to supply enough water to serve its population.

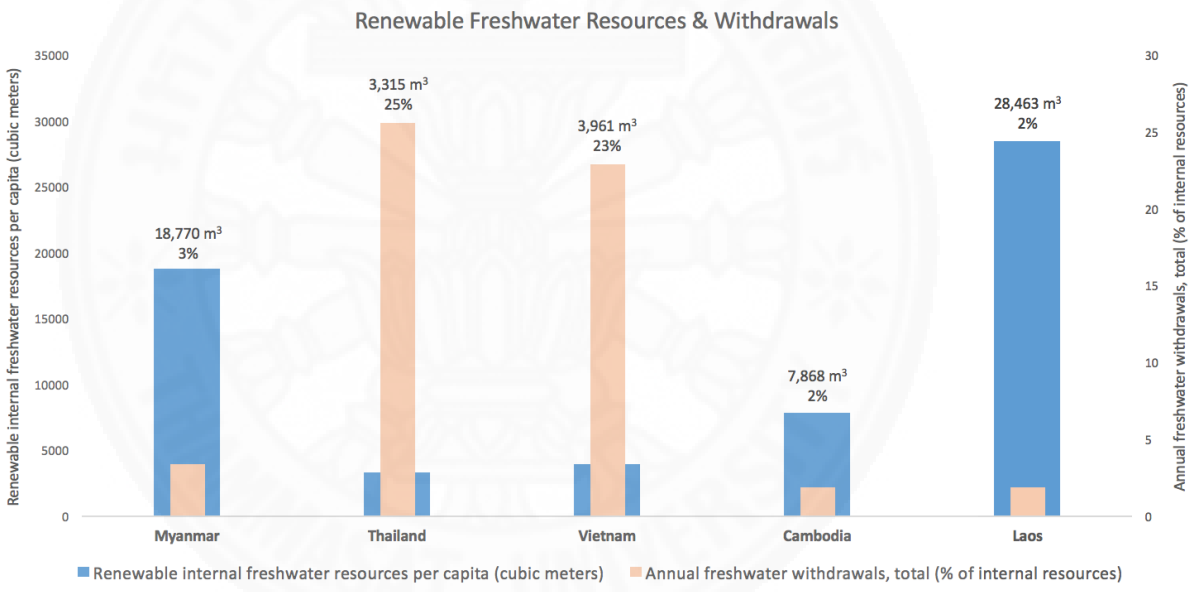

Figure 4.12 Entrepreneurial opportunities, Renewable freshwater resources and withdrawals in the Mekong area in 2014

The problem of access to improved source of water in the Mekong area is economic. There are freshwater resources to meet the need of the population. However, water is not transported to some area, and thus is not evenly accessible to people; and, even when water is physically accessible, some people could not afford it, which encourage them to opt for lower water quality source. In its publication *50 Breakthroughs Critical scientific and technological advances needed for sustainable global development*, the Institute for Globally Transformative Technologies

(Lawrence Berkeley National Lab) points out that the problem of water quality can be observed at 3 different levels:

1. **National level**: existing infrastructures that supply water fail to cover the whole national territory, especially rural areas. At this level, the problem is not likely to lead to opportunities for social entrepreneurs and impact investors.
2. **Community level**: Numerous solutions has already been developed to serve local communities. However, to remain financially sustainable, these solutions require maintenance and need to be implemented in area with a certain density of population. At this level, social entrepreneurs and impact investors can find opportunities in developing innovative solutions that could serve communities with a lower density of population, which could be find in the rural area of Mekong region.
3. **Household level**: Lots of water purification solutions have already been developed to serve households through purifying water at the point of use. The mains barriers that keep households from using these solutions are the cost involved, the complexity of use, and the time required for purifying water. As a result, many households are still not using point of use water purification solutions. Furthermore, another problem encountered at the household level is the recontamination of water that has already been purified due to lack hygiene for storing, retrieving, or using the water. Opportunities exist for social entrepreneurs and impact investors to develop innovative models that could remove these obstacles.

The Institute for Globally Transformative Technologies suggest 2 potential directions that could be explored by social entrepreneurs and impact investors as they represent entrepreneurial opportunities:

1. **Water pumps that automatically disinfect with chlorine**: This solution aims to use chlorine residual disinfectant properties to prevent the recontamination of purified water in the household. To be effective, it should be done automatically to avoid requiring users to change their behavior and to spend time for achieving this complex manipulation. Indeed, one of the most critical challenge is to dose the proper amount chlorine precisely in order to disinfect the water while

avoiding bad taste and toxicity. Implementing this solution would require the social entrepreneur to work closely with a researcher in order to develop a mechanism that could provide the right amount of chlorine to water that is flowing dynamically. In addition, the entrepreneur will need to develop a model that is financially sustainable to maintain the material and supply chlorine.

2. **Easy to use point-of-use water treatment systems**: This solution aims to withdraw the issues encountered by existing one (complexity and time involved in their use). The next solutions must work without human intervention, and be affordable. The main challenge will be to educate the market and demonstrate the values it creates for people.

CHAPTER 5
CONCLUSIONS

5.1 Focused Problems

First of all, this research has shown that there are definitely Focused Problems in the Mekong area. The researcher has identified two of them but more could be uncovered in the future. Furthermore, this research has also demonstrated that Focused Problems can lead to attractive entrepreneurial opportunities for social entrepreneurs and impact investors. This does not mean that every Focus Problems could lead to such opportunities, some may not lead to opportunities, or some may lead to opportunities for public change agents such as governments and international institutions. However, if a Focused Problem is defined from a field on which the private sector can intervene, therefore it could lead to entrepreneurial opportunities. In consequence, it can be said that the Mekong area is a potential host for social enterprises that have the potential to capture a share of the rapidly growing impact investing market to fuel social innovation and create significant impact in the region.

5.2 The SDG Framework

This research and its associated exploration have shown that SDG Framework can be used in way that create value for social entrepreneurs and impact investors, either retroactively via mapping an investment strategy (Sonen Capital) or the value chain of a business (SDG Compass); or proactively as explored in this research via using the SDG Framework as a tool to help defining problems and finding new entrepreneurial opportunities. Indeed, The SDG Framework has been successfully used as a starting point to define problem that could lead to entrepreneurial opportunities. However, it must be noted that the SDG Framework has its limitations, it many of its targets are not well defined, appeal to the private sector, lack of indicators, and official databases lack of updated data. As a result, the SDG Framework is a good starting point but not an inclusive tool. The researcher need to

look beyond the framework to seek for additional indicators, data source, and information.

5.3 Future researches

If this research has achieved its objective, it also paves the way for further researches that could be accomplished in the future:

1. This research has led to the identification of six potential targets of focus. Only two of them has been meticulously analyzed in the in-depth research to identify Focused Problem and entrepreneurial opportunities. As a result, additional work could be done to repeat what have been accomplished for the target 6.1 and 6.2 with the other potential targets of focus and could possibly lead to the identification of other Focused Problems and entrepreneurial opportunities in the Mekong area.
2. The research has led to the identification of the several entrepreneurial opportunities which seem to be attractive. A complementary research could dig down into these opportunities and test whether they can concretely become projects that successfully attract entrepreneurs, investors and other stakeholders. This would also test the assumption that these entrepreneurial opportunities can lead to the development of ecosystem around problems that lead to the co-creation of better business models and solutions, and reduce execution and market risks.

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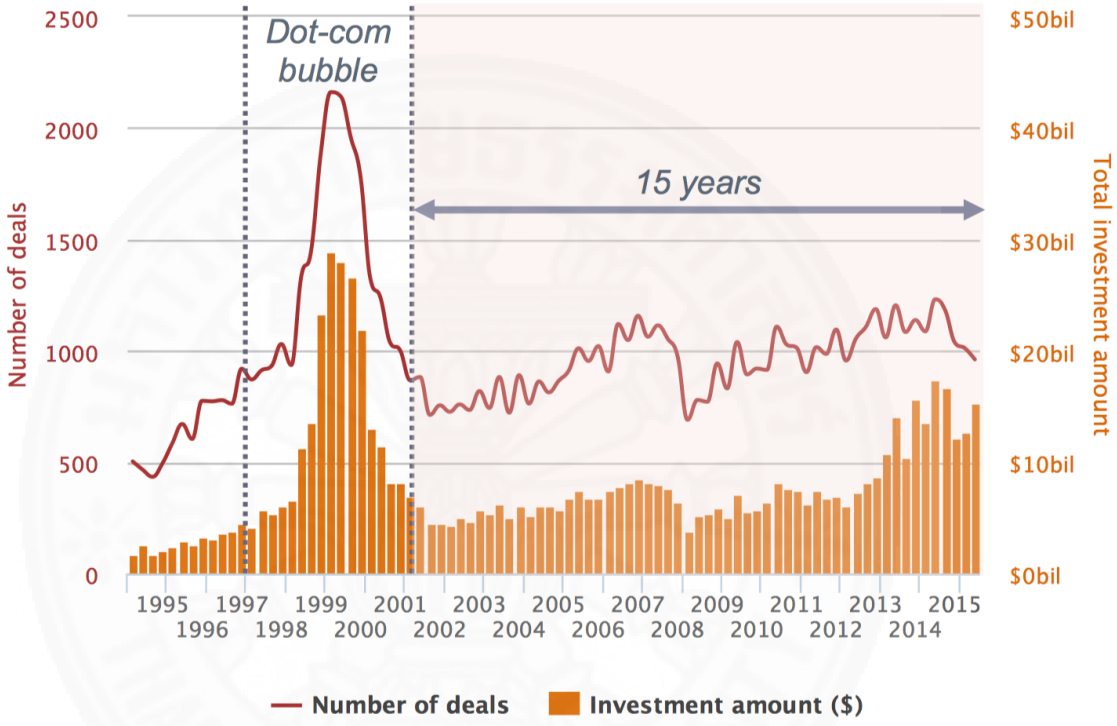
APPENDICES

APPENDIX A
VENTURE CAPITAL INDUSTRY

The VC industry is flat

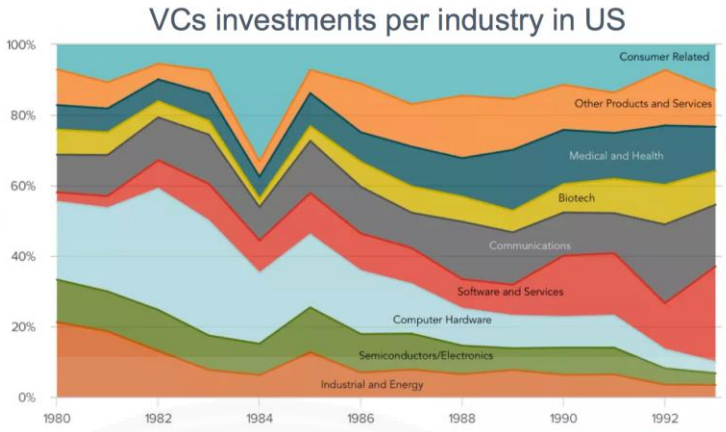
Source: MoneyTree Report 2016, Data: Thomson Reuters. By PwC & NVCA



VCs have always focused their investments on specific technologies

Source: Science & Engineering Indicators 2002. By National Science Foundation

70s
Semiconductors



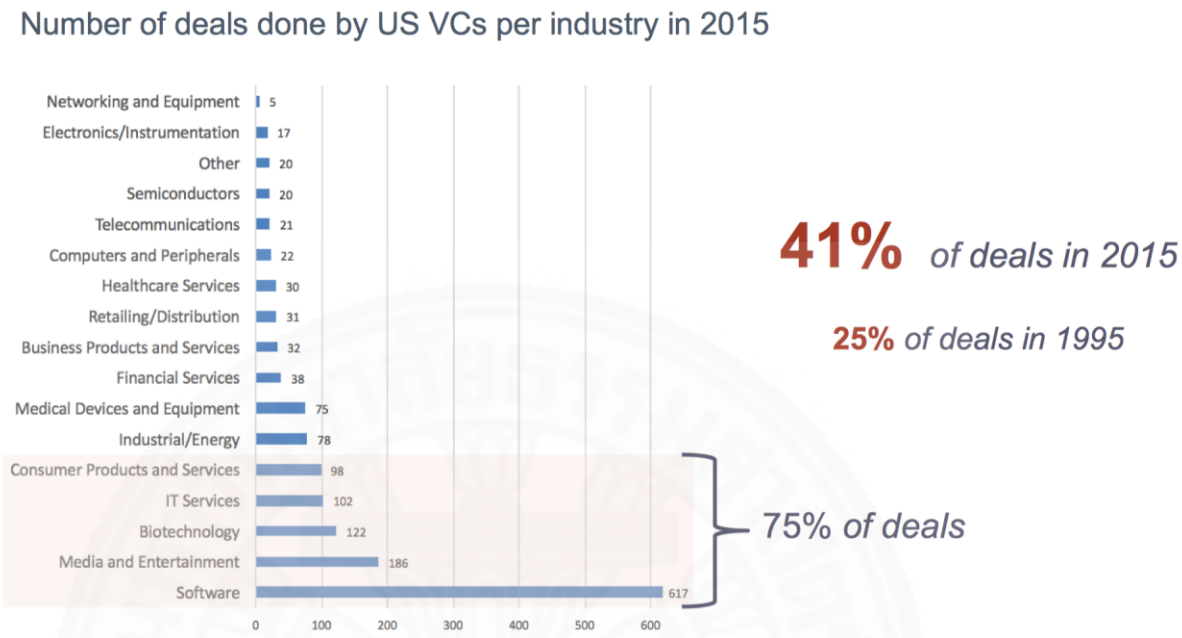
Mid 90s
Software

80s
Computer Hardware

End 80s – Beg. 90s
Fragmented
(Changing)

VCs focus their investments in the software industry

Source: MoneyTree Report 2016, Data: Thomson Reuters. By PwC & NVCA



APPENDIX B

SDGS' TARGETS AND THEIR OFFICIAL INDICATORS

SDG1 – End poverty in all its forms everywhere

Target 1.1 By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.90 a day

- Proportion of employed population below the international poverty line of US$1.90 per day
- Proportion of population below the international poverty line of US$1.90 per day

Target 1.2 By 2030, reduce at least by half the proportion of amen, women and children of all ages living in poverty in all its dimensions according to national definitions

- No indicators provided

Target 1.3 Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable

- Proportion of the poorest quintile population covered by labor market programs
- Proportion of the poorest quintile population covered by social assistance programs
- Proportion of the poorest quintile population covered by social insurance programs
- Proportion of the population covered by labor market programs
- Proportion of the population covered by social assistance programs
- Proportion of the population covered by social insurance programs
- Proportion of unemployed receiving unemployment benefits

Target 1.4 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

- No indicators provided

Target 1.5 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

- Missing persons due to disaster
- Number of deaths due to disaster
- Number of persons affected by disaster per 100,000 people
- Direct disaster economic loss in relation to global GDP

SDG2 – End hunger, achieve food security and improved nutrition, and promote sustainable agriculture

Target 2.1 by 2030 end hunger and ensure access by all people, in particular the poor and people in vulnerable situations including infants, to safe, nutritious and sufficient food all year round

- Prevalence of undernourishment
- Estimated prevalence of moderate or severe food insecurity in the adult population
- Estimated prevalence of moderate or severe food insecurity in the population (lower bound)
- Estimated prevalence of moderate or severe food insecurity in the population (upper bound)

Target 2.2 by 2030 end all forms of malnutrition, including achieving by 2025 the internationally agreed targets on stunting and wasting in children under five years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women, and older persons

- Proportion of stunted children (height for age below minus two standard deviations from the median) under the age of 5 years
- Proportion of stunted children (height for age below minus two standard deviations from the median) under the age of 5 years (lower bound)
- Proportion of stunted children (height for age below minus two standard deviations from the median) under the age of 5 years (upper bound)
- Proportion of overweight children (weight for height above plus two standard deviations from the median) under the age of 5 years
- Proportion of overweight children (weight for height above plus two standard deviations from the median) under the age of 5 years (lower bound)
- Proportion of overweight children (weight for height above plus two standard deviations from the median) under the age of 5 years (upper bound)
- Proportion of wasted children (weight for height below minus two standard deviations from the median) under the age of 5 years
- Proportion of wasted children (weight for height below minus two standard deviations from the median) under the age of 5 years (lower bound)
- Proportion of wasted children (weight for height below minus two standard deviations from the median) under the age of 5 years (upper bound)

Target 2.3 by 2030 double the agricultural productivity and the incomes of small-scale food producers, particularly women, indigenous peoples, 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

- No indicators provided

Target 2.4 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

- No indicators provided

Target 2.5 by 2020 maintain genetic diversity of seeds, cultivated plants, farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at 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

- Proportion of local breeds classified as being at risk of extinction
- Proportion of local breeds classified as being at unknown level of risk of extinction
- Proportion of local breeds classified as being not-at-risk of extinction

SDG3 – Ensure healthy lives and promote well-being for all at all ages

Target 3.1 by 2030 reduce the global maternal mortality ratio to less than 70 per 100,000 live births

- Proportion of births attended by skilled health personnel

Target 3.2 by 2030 end preventable deaths of newborns and under-five children

- Under-five mortality
- Neonatal mortality rate

Target 3.3 by 2030 end the epidemics of AIDS, tuberculosis, malaria, and neglected tropical diseases and combat hepatitis, water-borne diseases, and other communicable diseases

- Estimated HIV incidence rate
- Tuberculosis incidence per 100,000 population
- Tuberculosis incidence per 100,000 population (lower bound)
- Tuberculosis incidence per 100,000 population (upper bound)
- Malaria incidence per 1,000 population

Target 3.4 by 2030 reduce by one-third pre-mature mortality from non-communicable diseases (NCDs) through prevention and treatment, and promote mental health and wellbeing

- Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease
- Suicide mortality rate

Target 3.5 strengthen prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol

- Alcohol per capita consumption (aged 15 years and older) within a calendar year in liters of pure alcohol

Target 3.6 by 2020 halve global deaths and injuries from road traffic accidents

- Death rate due to road traffic injuries

Target 3.7 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 programs

- Adolescent birth rate per 1,000 adolescent women aged 15-19

Target 3.8 achieve universal health coverage (UHC), including financial risk protection, access to quality essential health care services, and access to safe, effective, quality, and affordable essential medicines and vaccines for all

- No indicators provided

Target 3.9 by 2030 substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water, and soil pollution and contamination

- Mortality rate attributed to household and ambient air pollution
- Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene
- Mortality rate attributed to unintentional poisonings

SDG4 – Ensure inclusive and equitable quality education and promote life-long learning opportunities for all

Target 4.1 by 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes

- Proportion of children at the end of primary achieving at least a minimum proficiency level in mathematics
- Proportion of children at the end of primary achieving at least a minimum proficiency level in reading
- Proportion of children at the end of lower secondary achieving at least a minimum proficiency level in mathematics
- Proportion of children at the end of lower secondary achieving at least a minimum proficiency level in reading
- Proportion of children in grades 2/3 achieving at least a minimum proficiency level in reading
- Proportion of children in grades 2/3 achieving at least a minimum proficiency level in mathematics

Target 4.2 by 2030 ensure that all girls and boys have access to quality early childhood development, care and pre- primary education so that they are ready for primary education

- Proportion of children under 5 years of age who are developmentally on track in health, learning and psychosocial well-being, by sex
- Participation rate in organized learning (one year before the official primary entry age

Target 4.3 by 2030 ensure equal access for all women and men to affordable quality technical, vocational and tertiary education, including university

- Participation rate of youth and adults in formal and non-formal education and training in the previous 12 months

Target 4.4 by 2030, increase by x% the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship

- Proportion of youth and adults with information and communications technology skills, by type of skill

Target 4.5 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

- Gender parity index for achievement in mathematics by the end of lower secondary
- Gender parity index for achievement in mathematics by the end of primary
- Gender parity index for achievement in mathematics in grades 2/3
- Gender parity index for achievement in reading by the end of lower secondary
- Gender parity index for achievement in reading by the end of primary

- Gender parity index for achievement in reading in grades 2/3
- Gender parity index for participation rate in organized learning (one year before official primary entry age)
- Gender parity index of teachers in lower secondary education who are trained
- Gender parity index of teachers in pre-primary education who are trained
- Gender parity index of teachers in primary education who are trained
- Gender parity index of teachers in secondary education who are trained
- Gender parity index of teachers in upper secondary education who are trained

Target 4.6 by 2030 ensure that all youth and at least x% of adults, both men and women, achieve literacy and numeracy

- Percentage of population in a given age group achieving at least a fixed level of proficiency in functional literacy skills
- Percentage of population in a given age group achieving at least a fixed level of proficiency in functional numeracy skills

Target 4.7 by 2030 ensure all learners acquire 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

- No indicators provided

SDG5 – Achieve gender equality and empower all women and girl

Target 5.1 end all forms of discrimination against all women and girls everywhere

- No indicators provided

Target 5.2 eliminate all forms of violence against all women and girls in public and private spheres, including trafficking and sexual and other types of exploitation

- No indicators provided

Target 5.3 eliminate all harmful practices, such as child, early and forced marriage and female genital mutilations

- Proportion of women aged 20-24 years who were married by age 15
- Proportion of women aged 20-24 years who were married by age 18

Target 5.4 recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies, and the promotion of shared responsibility within the household and the family as nationally appropriate

- Time spent on unpaid domestic and care work

Target 5.5 ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic, and public life

- Proportion of seats held by women in national parliaments
- Proportion of women in managerial positions

Target 5.6 ensure universal access to sexual and reproductive health and reproductive rights as agreed in accordance with the Program of Action of the ICPD and the Beijing Platform for Action and the outcome documents of their review conferences

- No indicators provided

SDG6 – Ensure availability and sustainable management of water and sanitation for all

Target 6.1 by 2030, achieve universal and equitable access to safe and affordable drinking water for all

- Proportion of population using safely managed drinking water services

Target 6.2 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

- Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water

Target 6.3 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 by x% globally

- No indicators provided

Target 6.4 by 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity, and substantially reduce the number of people suffering from water scarcity

- Level of water stress: freshwater withdrawal as a proportion of available freshwater resources

Target 6.5 by 2030 implement integrated water resources management at all levels, including through transboundary cooperation as appropriate

- Degree of integrated water resources management implementation (0-100)

Target 6.6 by 2020 protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes

- No indicators provided

SDG7 – Ensure access to affordable, reliable, sustainable, and modern energy for all

Target 7.1 by 2030 ensure universal access to affordable, reliable, and modern energy services

- Proportion of population with access to electricity
- Proportion of population with primary reliance on clean fuels and technology

Target 7.2 increase substantially the share of renewable energy in the global energy mix by 2030

- Renewable energy shares in the total final energy consumption

Target 7.3 double the global rate of improvement in energy efficiency by 2030

- Energy intensity level of primary energy

SDG8 – Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Target 8.1 sustain per capita economic growth in accordance with national circumstances, and in particular at least 7% per annum GDP growth in the least-developed countries

- Growth rate of real GDP per capita

Target 8.2 achieve higher levels of productivity of economies through diversification, technological upgrading and innovation, including through a focus on high value added and labor-intensive sectors

- Growth rate of real GDP per employed person

Target 8.3 promote development-oriented policies that support productive activities, decent job creation, entrepreneur- ship, creativity and innovation, and encourage formali- zation and growth of micro-, small- and medium-sized enterprises including through access to financial services

- No indicators provided

Target 8.4 improve progressively through 2030 global resource efficiency in consumption and production, and endeavor to decouple economic growth from environmental degradation in accordance with the 10-year framework of programs on sustainable consumption and production with developed countries taking the lead

- Material footprint
- Material footprint per capita
- Material footprint per unit of GDP
- Domestic material consumption
- Domestic material consumption per capita
- Domestic material consumption per unit of GDP

Target 8.5 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 value

- Unemployment rate

Target 8.6 by 2020 substantially reduce the proportion of youth not in employment, education or training

- Proportion of youth not in education, employment or training

Target 8.7 take immediate and effective measures to secure the prohibition and elimination of the worst forms of child labor, eradicate forced labor, and by 2025 end child labor in all its forms including recruitment and use of child soldiers

- Number of children aged 5-17 years engaged in labor
- Proportion of children aged 5-17 years engaged in labor

Target 8.8 protect labor rights and promote safe and secure working environments of all workers, including migrant workers, particularly women migrants, and those in precarious employment

- No indicators provided

Target 8.9 by 2030 devise and implement policies to promote sustainable tourism which creates jobs, promotes local culture and products

- No indicators provided

Target 8.10 strengthen the capacity of domestic financial institutions to encourage and to expand access to banking, insurance and financial services for all

- Proportion of adults (15 years and older) with an account at a bank or other financial institution or with a mobile-money-service provider

SDG9 – Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Target 9.1 develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infra- structure, to support economic development and human well-being, with a focus on affordable and equitable access for all

- Freight volume, by air transport
- Passenger volume, by air transport

Target 9.2 promote inclusive and sustainable industrialization, and by 2030 raise significantly industry's share of employment and GDP in line with national circumstances, and double its share in LDCs

- Manufacturing value added per capita at constant 2010 United States dollars
- Manufacturing value added share in GDP at constant 2010 United States dollars
- Manufacturing employment as a proportion of total employment

Target 9.3 increase the access of small-scale industrial and other enterprises, particularly in developing countries, to financial services including affordable credit and their integration into value chains and markets

- No indicators provided

Target 9.4 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, all countries taking action in accordance with their respective capabilities

- CO2 emission per unit of value added

Target 9.5 enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, particularly developing countries, including by 2030 encouraging innovation and increasing the number of R&D workers per one million people by x% and public and private R&D spending

- Research and development (R&D) expenditure as a proportion of GDP
- Researchers (in full-time equivalent) per million inhabitants

SDG10 – Reduce inequality within and among countries

Target 10.1 by 2030 progressively achieve and sustain income growth of the bottom 40% of the population at a rate higher than the national average

- Growth rates of household expenditure or income per capita
- Growth rates of household expenditure or income per capita among the bottom 40 per cent of the population

Target 10.2 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

- No indicators provided

Target 10.3 ensure equal opportunity and reduce inequalities of outcome, including through eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and actions in this regard

- No indicators provided

Target 10.4 adopt policies especially fiscal, wage, and social protection policies and progressively achieve greater equality

- Labor share of GDP, comprising wages and social protection transfers

Target 10.5 improve regulation and monitoring of global financial markets and institutions and strengthen implementation of such regulations

- No indicators provided

Target 10.6 ensure enhanced representation and voice of developing countries in decision making in global international economic and financial institutions in order to deliver more effective, credible, accountable and legitimate institutions

- Proportion of developing countries in the membership of the African Development Bank
- Proportion of developing countries in the membership of the African Development Bank
- Proportion of developing countries in the membership of the Asian Development Bank
- Proportion of developing countries in the membership of the Inter-American Development Bank
- Proportion of developing countries in the membership of the International Bank for Reconstruction and Development
- Proportion of developing countries in the membership of the International Finance Corporation
- Proportion of developing countries in the membership of the International Monetary Fund
- Proportion of developing countries in the membership of the UN Economic and Social Council
- Proportion of developing countries in the membership of the UN General Assembly
- Proportion of developing countries in the membership of the UN Security Council
- Proportion of developing countries in the membership of the World Trade Organization
- Proportion of voting rights of developing countries in the African Development Bank
- Proportion of voting rights of developing countries in the African Development Bank
- Proportion of voting rights of developing countries in the Asian Development Bank
- Proportion of voting rights of developing countries in the Inter-American Development Bank
- Proportion of voting rights of developing countries in the International Bank for Reconstruction and Development
- Proportion of voting rights of developing countries in the International Finance Corporation
- Proportion of voting rights of developing countries in the International Monetary Fund
- Proportion of voting rights of developing countries in the UN Economic and Social Council
- Proportion of voting rights of developing countries in the UN General Assembly
- Proportion of voting rights of developing countries in the UN Security Council
- Proportion of voting rights of developing countries in the World Trade Organization

Target 10.7 facilitate orderly, safe, regular and responsible migration and mobility of people, including through implementation of planned and well-managed migration policies

- No indicators provided

SDG11 – Make cities and human settlements inclusive, safe, resilient and sustainable

Target 11.1 by 2030, ensure access for all to adequate, safe and affordable housing and basic services, and upgrade slums

- Proportion of urban population living in slums, informal settlements or inadequate housing

Target 11.2 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

- No indicators provided

Target 11.3 by 2030 enhance inclusive and sustainable urbanization and capacities for participatory, integrated and sustainable human settlement planning and management in all countries

- No indicators provided

Target 11.4 strengthen efforts to protect and safeguard the world's cultural and natural heritage

- No indicators provided

Target 11.5 by 2030 significantly reduce the number of deaths and the number of affected people and decrease by y% the economic losses relative to GDP caused by disasters, including water-related disasters, with the focus on protecting the poor and people in vulnerable situations

- Number of deaths, missing persons and persons affected by disaster per 100,000 people
- Direct disaster economic loss in relation to global GDP, including disaster damage to critical infrastructure and disruption of basic services

Target 11.6 by 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality, municipal and other waste management

- Annual mean levels of fine particulate matter (PM2.5) in cities (population weighted)

Target 11.7 by 2030, provide universal access to safe, inclusive and accessible, green and public spaces, particularly for women and children, older persons and persons with disabilities

- No indicators provided

SDG12 – Ensure sustainable consumption and production patterns

Target 12.1 implement the 10-Year Framework of Programs on sustainable consumption and production (10YFP), all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries

- No indicators provided

Target 12.2 by 2030 achieve sustainable management and efficient use of natural resources

- Material footprint
- Material footprint per capita
- Material footprint per unit of GDP
- Domestic material consumption
- Domestic material consumption per capita
- Domestic material consumption per unit of GDP

Target 12.3 by 2030 halve per capita global food waste at the retail and consumer level, and reduce food losses along production and supply chains including post-harvest losses

- No indicators provided

Target 12.4 by 2020 achieve environmentally sound management of chemicals and all wastes throughout their life cycle in accordance with agreed international frame-works and significantly reduce their release to air, water and soil to minimize their adverse impacts on human health and the environment

- Number of parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement

Target 12.5 by 2030, substantially reduce waste generation through prevention, reduction, recycling, and reuse

- No indicators provided

Target 12.6 encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle

- No indicators provided

Target 12.7 promote public procurement practices that are sustainable in accordance with national policies and priorities

- No indicators provided

Target 12.8 by 2030 ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature

- No indicators provided

SDG13 – Take urgent action to combat climate change and its impact

Target 13.1 strengthen resilience and adaptive capacity to climate related hazards and natural disasters in all countries

- Number of deaths, missing persons and persons affected by disaster per 100,000 people
- Number of countries with national and local disaster risk reduction strategies

Target 13.2 integrate climate change measures into national policies, strategies, and planning

- No indicators provided

Target 13.3 improve education, awareness raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction, and early warning

- No indicators provided

SDG14 – Conserve and sustainably use the oceans, seas, and marine resources for sustainable development

Target 14.1 by 2025, prevent and significantly reduce marine pollution of all kinds, particularly from land-based activities, including marine debris and nutrient pollution

- No indicators provided

Target 14.2 by 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration, to achieve healthy and productive oceans

- No indicators provided

Target 14.3 minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels

- No indicators provided

Target 14.4 by 2020, effectively regulate harvesting, and end overfishing, illegal, unreported and unregulated (IUU) fishing and destructive fishing practices and

implement science-based management plans, to restore fish stocks in the shortest time feasible at least to levels that can produce maximum sustainable yield as determined by their biological characteristics

- Proportion of fish stocks within biologically sustainable levels

Target 14.5 by 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on best available scientific information

- Coverage of protected areas in relation to marine areas

Target 14.6 by 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, and eliminate subsidies that contribute to IUU fishing, and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the WTO fisheries subsidies negotiation

- No indicators provided

Target 14.7 by 2030 increase the economic benefits to SIDS and LDCs from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism

- No indicators provided

SDG15 – Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Target 15.1 by 2020 ensure conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wet- lands, mountains and drylands, in line with obligations under international agreements

- Forest area as a proportion of total land area
- Proportion of important sites for freshwater biodiversity that are covered by protected areas
- Proportion of important sites for terrestrial biodiversity that are covered by protected areas

Target 15.2 by 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests, and increase afforestation and reforestation by x% globally

- No indicators provided

Target 15.3 by 2020, combat desertification, and restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land-degradation neutral world

- No indicators provided

Target 15.4 by 2030 ensure the conservation of mountain ecosystems, including their biodiversity, to enhance their capacity to provide benefits which are essential for sustainable development

- Coverage by protected areas of important sites for mountain biodiversity

Target 15.5 take urgent and significant action to reduce degradation of natural habitat, halt the loss of biodiversity, and by 2020 protect and prevent the extinction of threatened species

- Red List Index
- Red List Index (lower bound)

- Red List Index (upper bound)

Target 15.6 ensure fair and equitable sharing of the benefits arising from the utilization of genetic resources, and promote appropriate access to genetic resources

- No indicators provided

Target 15.7 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

- No indicators provided

Target 15.8 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

- No indicators provided

Target 15.9 by 2020, integrate ecosystems and biodiversity values into national and local planning, development processes and poverty reduction strategies, and accounts

- No indicators provided

SDG16 – Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

Target 16.1 significantly reduce all forms of violence and related death rates everywhere

- Number of victims of intentional homicide per 100,000 population
- Number of victims of intentional homicide per 100,000 population (lower bound)
- Number of victims of intentional homicide per 100,000 population (upper bound)

Target 16.2 end abuse, exploitation, trafficking and all forms of violence and torture against children

1 Proportion of children aged 1-17 years who experienced any physical punishment and/or psychological aggression by caregivers in the past month
2 Proportion of young women and men aged 18-29 years who experienced sexual violence by age 18

Target 16.3 promote the rule of law at the national and international levels, and ensure equal access to justice for all

3 Unsentenced detainees as a proportion of overall prison population

Target 16.4 by 2030 significantly reduce illicit financial and arms flows, strengthen recovery and return of stolen assets, and combat all forms of organized crime

- No indicators provided

Target 16.5 substantially reduce corruption and bribery in all its forms

4 Proportion of businesses that had at least one contact with a public official and that paid a bribe to a public official, or were asked for a bribe by those public officials during the previous 12 months

Target 16.6 develop effective, accountable and transparent institutions at all levels

- No indicators provided

Target 16.7 ensure responsive, inclusive, participatory and representative decision-making at all levels

- No indicators provided

Target 16.8 broaden and strengthen the participation of developing countries in the institutions of global governance

- Proportion of developing countries in the membership of the African Development Bank
- Proportion of developing countries in the membership of the African Development Bank
- Proportion of developing countries in the membership of the Asian Development Bank
- Proportion of developing countries in the membership of the Inter-American Development Bank
- Proportion of developing countries in the membership of the International Bank for Reconstruction and Development
- Proportion of developing countries in the membership of the International Finance Corporation
- Proportion of developing countries in the membership of the International Monetary Fund
- Proportion of developing countries in the membership of the UN Economic and Social Council
- Proportion of developing countries in the membership of the UN General Assembly
- Proportion of developing countries in the membership of the UN Security Council
- Proportion of developing countries in the membership of the World Trade Organization
- Proportion of voting rights of developing countries in the African Development Bank
- Proportion of voting rights of developing countries in the African Development Bank
- Proportion of voting rights of developing countries in the Asian Development Bank
- Proportion of voting rights of developing countries in the Inter-American Development Bank
- Proportion of voting rights of developing countries in the International Bank for Reconstruction and Development
- Proportion of voting rights of developing countries in the International Finance Corporation
- Proportion of voting rights of developing countries in the International Monetary Fund
- Proportion of voting rights of developing countries in the UN Economic and Social Council
- Proportion of voting rights of developing countries in the UN General Assembly
- Proportion of voting rights of developing countries in the UN Security Council
- Proportion of voting rights of developing countries in the World Trade Organization

Target 16.9 by 2030 provide legal identity for all including birth registration
Proportion of births registered with a civil authority

Target 16.10 ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements
Number of verified cases of killing, kidnapping, enforced disappearance, arbitrary detention and torture of journalists, associated media personnel, trade unionists and human rights advocates in the previous 12 months

SDG17 – Strengthen the means of implementation and revitalize the global partnership for sustainable development

Finance

Target 17.1 strengthen domestic resource mobilization, including through international support to developing countries to improve domestic capacity for tax and other revenue collection

- No indicators provided

Target 17.2 developed countries to implement fully their ODA commitments, including to provide 0.7% of GNI in ODA to developing countries of which 0.15-0.20% to least- developed countries
Net official development assistance (ODA) as a percentage of OECD-DAC donors' GNI, by donor
Net official development assistance (ODA) from OECD-DAC countries, by donor
Net official development assistance (ODA) to landlocked developing countries as a percentage of OECD-DAC donors' GNI, by donor

Net official development assistance (ODA) to landlocked developing countries from OECD-DAC countries, by donor
Net official development assistance (ODA) to LCDs from OECD-DAC countries, by donor
Net official development assistance (ODA) to LDCs as a percentage of OECD-DAC donors' GNI, by donor
Net official development assistance (ODA) to small island states (SIDS) as a percentage of OECD-DAC donors' GNI, by donor
Net official development assistance (ODA) to small island states (SIDS) from OECD-DAC countries, by donor

Target 17.3 mobilize additional financial resources for developing countries from multiple sources
Volume of remittances (in United States dollars) as a proportion of total GDP

Target 17.4 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 (HIPC) to reduce debt distress
Debt service as a proportion of exports of goods and services

Target 17.5 adopt and implement investment promotion regimes for LDCs

- No indicators provided

Technology

Target 17.6 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, including through improved coordination among existing mechanisms, particularly at UN level, and through a global technology facilitation mechanism when agreed

- Fixed Internet broadband Subscriptions per 100 inhabitants

Target 17.7 promote development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favorable terms, including on concessional and preferential terms, as mutually agreed

- No indicators provided

Target 17.8 fully operationalize the Technology Bank and STI (Science, Technology and Innovation) capacity building mechanism for LDCs by 2017, and enhance the use of enabling technologies in particular ICT

- Proportion of individuals using the Internet

Capacity Building

Target 17.9 enhance international support for implementing effective and targeted capacity building in developing countries to support national plans to implement all sustainable development goals, including through North- South, South-South, and triangular cooperation

- Dollar value of financial and technical assistance (including through North-South, South-South and triangular cooperation) committed to developing countries

Trade

Target 17.10 promote a universal, rules-based, open, non- discriminatory and equitable multilateral trading system under the WTO including through the conclusion of negotiations within its Doha Development Agenda

- Worldwide weighted tariff-average of agriculture products, under the most-favored-nation status
- Worldwide weighted tariff-average of agriculture products, under the preferential status
- Worldwide weighted tariff-average of all products, under the most-favored-nation status
- Worldwide weighted tariff-average of all products, under the preferential status
- Worldwide weighted tariff-average of arms, under the most-favored-nation status
- Worldwide weighted tariff-average of arms, under the preferential status
- Worldwide weighted tariff-average of clothing, under the most-favored-nation status
- Worldwide weighted tariff-average of clothing, under the preferential status
- Worldwide weighted tariff-average of industrial products, under the most-favored-nation status
- Worldwide weighted tariff-average of industrial products, under the preferential status
- Worldwide weighted tariff-average of oil, under the most-favored-nation status
- Worldwide weighted tariff-average of oil, under the preferential status
- Worldwide weighted tariff-average of textiles, under the most-favored-nation status
- Worldwide weighted tariff-average of textiles, under the preferential status

Target 17.11 increase significantly the exports of developing countries, in particular with a view to doubling the LDC share of global exports by 2020

Share of global merchandise exports
Share of global services exports

Target 17.12 realize timely implementation of duty-free, quota-free market access on a lasting basis for all least developed countries consistent with WTO decisions, including through ensuring that preferential rules of origin applicable to imports from LDCs are transparent and simple, and contribute to facilitating market access

Average tariffs faced by developing countries, least developed countries and small island developing States, under the preferential status

Systemic issues policy and institutional coherence

Target 17.13 enhance global macroeconomic stability including through policy coordination and policy coherence

- No indicators provided

Target 17.14 enhance policy coherence for sustainable development

- No indicators provided

Target 17.15 respect each country's policy space and leadership to establish and implement policies for poverty eradication and sustainable development

- No indicators provided

Multi-stakeholder partnerships

Target 17.16 enhance the global partnership for sustainable development complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technologies and financial resources to support the achievement of sustainable development goals in all countries, particularly developing countries

- No indicators provided

Target 17.17 encourage and promote effective public, public-private, and civil society partnerships, building on the experience and resourcing strategies of partnerships

- No indicators provided

Data, monitoring and accountability

Target 17.18 by 2020, enhance capacity building support to developing countries, including for LDCs and SIDS, 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

- Number of countries with a national statistical plan that is fully funded and under implementation

Target 17.19 by 2030, build on existing initiatives to develop measurements of progress on sustainable development that complement GDP, and support statistical capacity building in developing countries

- Dollar value of all resources made available to strengthen statistical capacity in developing countries
- Proportion of countries that have conducted at least one population and housing census in the last 10 years

APPENDIX C

SURVEY

Opportunities in the Mekong Area

The purpose of this survey is to evaluate the potential of 6 entrepreneurial opportunities from the perspective of Impact Investors and Social Entrepreneurs. These opportunities are focused on the Mekong area and more specifically on Myanmar, Thailand, and Vietnam, which together host more than 210 million people.

For each of the 6 situation you will be requested to:
- Quickly evaluate the potential of the opportunity on a 1 to 5 scale
- Provide any comment, idea or question that you have

* Required

1. **You are** *
Mark only one oval.

- ◯ an Investor
- ◯ an Entrepreneur
- ◯ Other: .....

2. **You are based in** *
Mark only one oval.

- ◯ ASEAN
- ◯ US
- ◯ Other:

Clean Water & Sanitation in Rural Area

1 - Safe Dringking Water

11 million people living in rural areas do not have access to improved water source. Among them, 9 million are located in Myanmar (25% of Myanmar rural population). This problem impacts the lives of individuals and the Health, Education, and Economy of entire communities:
- Health: 88% of disease in the developing world is caused by unsafe drinking water.
- Education: Improving education standards in the developing world is dependent upon access to safe drinking water.
- Economic:
  - Direct costs of contracting and treating a disease
  - Indirect costs related to the disease (productivity)
  - Costs related to time spent on water collection.

3. **1.a - Evaluation of the opportunity**
How much would you want to explore more about this problem?
Mark only one oval.

	1	2	3	4	5	
Low potential	◯	◯	◯	◯	◯	High potential

4. **1.b - Comment**

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2 - Sanitation Facilities

28 million people living in rural areas do not have access to improved sanitation facilities (18 million in Vietnam and 8 million in Myanmar). Furthermore, open defecation is practiced by more than 3 million people across these 3 countries (this figure reach 10 million if we include Cambodia and Laos).
Similarly to the problem of lack of access to clean water, the lack of access to sanitation and hygiene as dramatic impact on individuals and communities (Health, Education, Economic).

5. **2.a - Evaluation of the opportunity**
How much would you want to explore more about this problem?
Mark only one oval.

	1	2	3	4	5	
Low potential	◯	◯	◯	◯	◯	High potential

6. **2.b - Comment**

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Affordable & Clean Energy

3 - Access to Energy in Rural Areas

While Thai and Vietnamese rural areas have a almost perfect access to electricity, 24 million Myanmar people living in rural area do not have access to electricity (80% of Myanmar rural population).
Furthermore, more than 80 million rural people across these countries do not have access to non-solid fuels. This situation have a strong impact on the industrial and economic development as well as an impact on education.

7. **3.a - Evaluation of the opportunity**
How much would you want to explore more about this problem?
Mark only one oval.

	1	2	3	4	5	
Low potential	◯	◯	◯	◯	◯	High potential

8. **3.b - Comment**

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4 - Renewable Energy

The demand for electricity in the region is expected to raise in the coming years. Electricity production from oil, gas and coal sources represent 90% of Thai production and 55% of Vietnamese production. Renewable source of electricity needs to be developed in order to provide a solid alternative to the production of electricity from fossils energy to meet the growing demand.

- Myanmar Electric power consumption per capita is 165 kWh
  - Equivalent to Thai consumption 40 years ago (Nowadays, it's 15 times higher)
  - Equivalent to Vietnamese consumption 20 years ago (Nowadays it's 8 times higher)

- Myanmar exports 40% of its electricity production, which come from hydroelectric sources at 75%. However, it remains a fairly low electricity producer and the domestic demand is expected to raise dramatically, especially when the rural population will have access to electric power.

9. **4.a - Evaluation of the opportunity**

How much would you want to explore more about this problem?
Mark only one oval.

	1	2	3	4	5	
Low potential	◯	◯	◯	◯	◯	High potential

10. **4.b - Comment**

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Sustainable Cities

5 - Urban Human Settlement

The population is getting increasingly urban world wide and this observation is also true in the Mekong Area. Last year, the urban population of Thailand reached 50% and it keep increasing. In Vietnam and Myanmar a third of the population is already located in urban areas. Developing sustainable human settlement is an important challenge, we estimate there are 24 million people living in slums:

- Myanmar: 7.5 million people (40% of urban population)
- Thailand: 8.5 million people (25% of urban population)
- Vietnam: 8.5 million people (27% of urban population)

11. **5.a - Evaluation of the opportunity**

How much would you want to explore more about this problem?
Mark only one oval.

	1	2	3	4	5	
Low potential	◯	◯	◯	◯	◯	High potential

12. **5.b - Comment**

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6 - Organic Waste Management

Myanmar, Thailand, and Vietnam produce together approximately 45 million tons of Municipal Solid Waste (MSW) per years. which are from 50% to 60% organic. The landfill capacity is close from being reached and authorities face public resistance for the opening of new landfill areas.
New waste management and treatment strategies are needed to reduce waste production, achieve waste separation and recycling. Especially for treating bags with high organic components.

13. **6.a - Evaluation of the opportunity**

How much would you want to explore more about this problem?
Mark only one oval.

	1	2	3	4	5	
Low potential	◯	◯	◯	◯	◯	High potential

14. **6.b - Comment**

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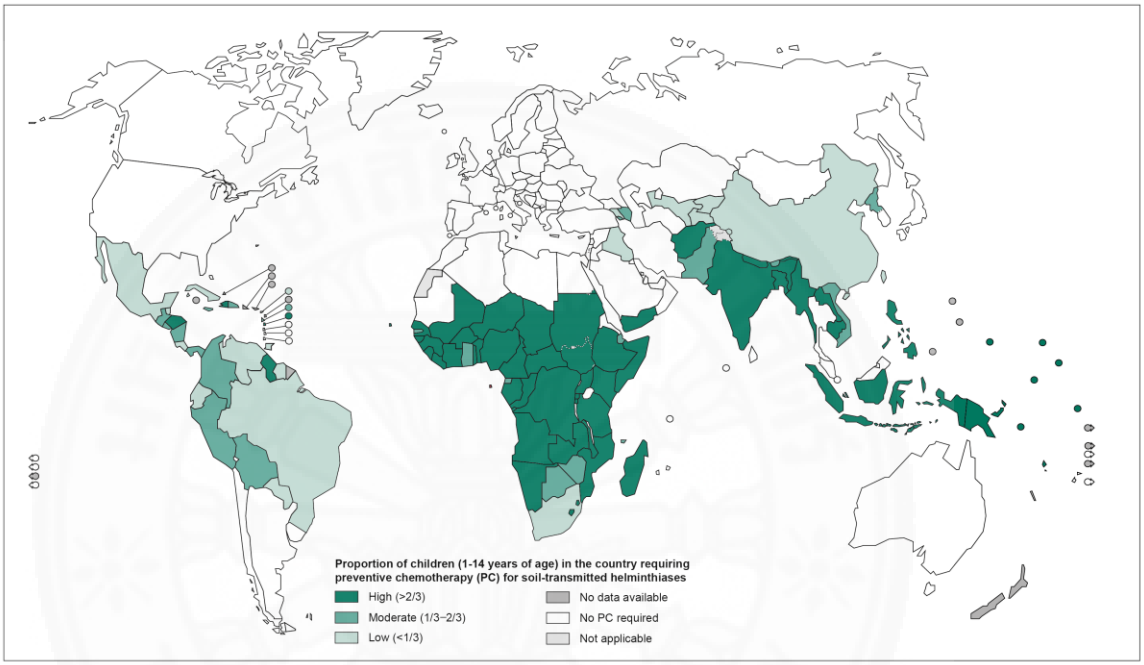
APPENDIX D

STH REQUIRED PREVENTION WORLD MAP 2014

Source: World Health Organization

Proportion of children (1-14 years of age) in the country requiring preventive chemotherapy (PC) for soil-transmitted helminthiases, worldwide, 2014



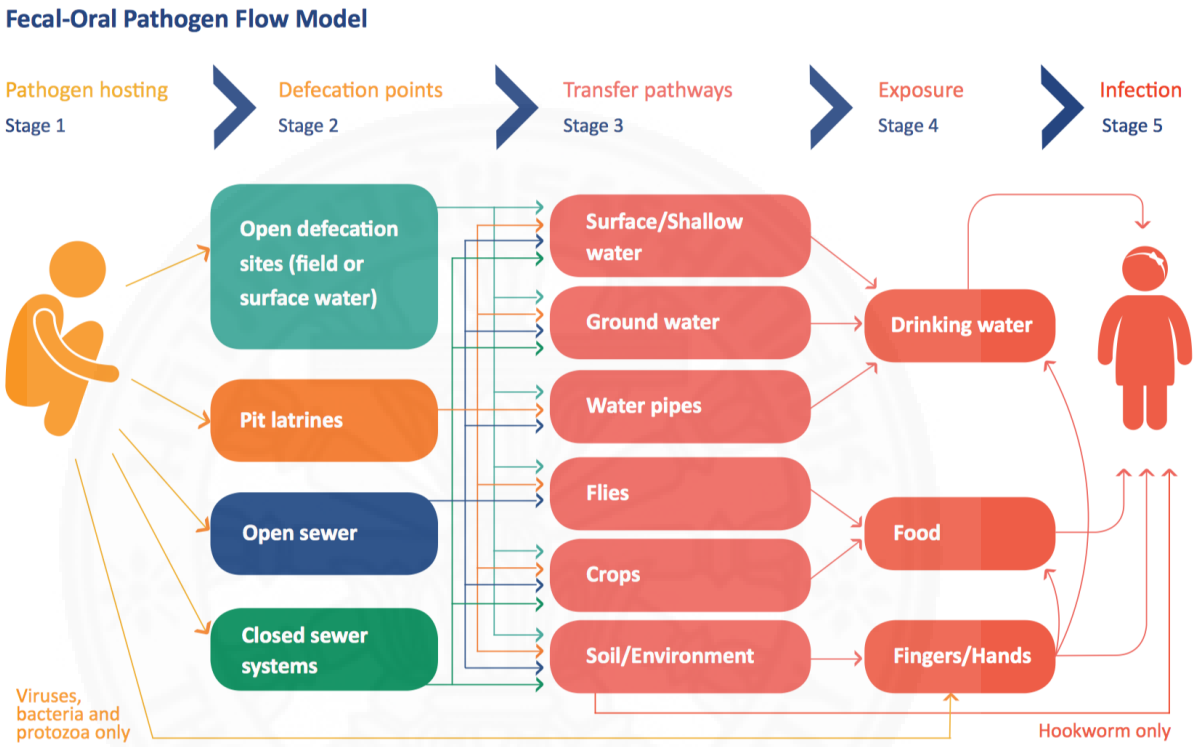
Data Source: World Health Organization
Map Production: Control of Neglected Tropical Diseases (NTD)
World Health Organization

World Health Organization

APPENDIX E

FECAL-ORAL PATHOGEN FLOW MODEL

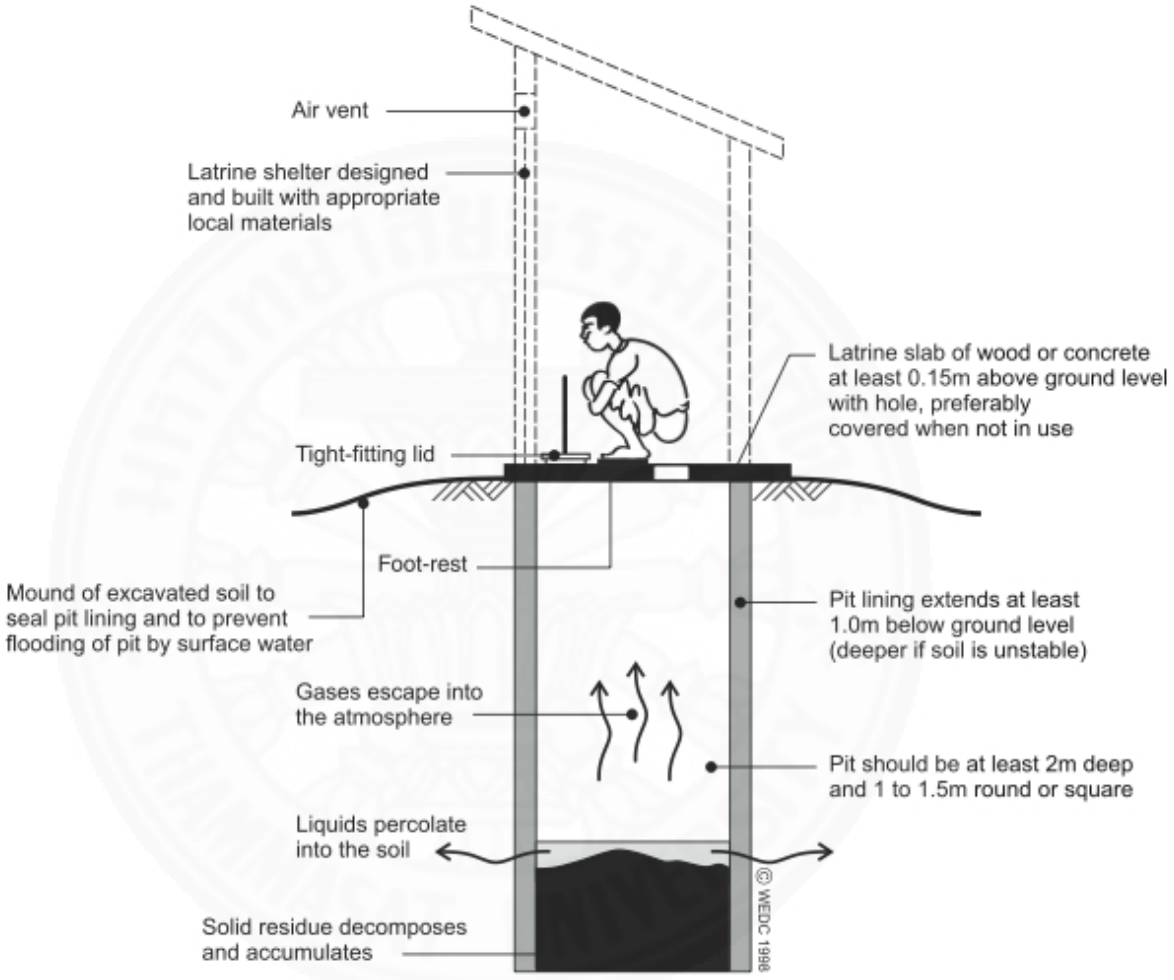
Source: 50 Breakthroughs Critical scientific and technological advances needed for sustainable global development by the LIGTT, Institute for Globally Transformative Technologies



APPENDIX F

PIT LATRINES

Source: civilengineersforum.com



BIOGRAPHY

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