ASSESSING THE LEVEL OF PARTICIPATION OF SMALL STAKEHOLDERS IN INTERNATIONAL WATER MANAGEMENT PROJECTS FOR FOOD SECURITY IN LOWER MEKONG BASIN: THE CASE OF RICE PRODUCTION IN THE KHONG-LOEI-CHI-MUN PROJECT

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A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Arts in Southeast Asian Studies
Inter-Department of Southeast Asian Studies
Graduate School
Chulalongkorn University
Academic Year 2023

การประเมินระดับการมีส่วนร่วมของผู้มีส่วนได้ส่วนเสียรายย่อยของท้องถิ่นในโครงการบริหารจัดการน้ำระหว่างประเทศเพื่อความมั่นคงทางอาหารในลุ่มน้ำโขงตอนล่าง:กรณีศึกษาของการผลิตข้าวในโครงการ โขง เลย ชี มูล

น.ส.เพาไลน์ เอสซูรี

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาศิลปศาสตรมหาบัณฑิต
สาขาวิชาเอเชียตะวันออกเฉียงใต้ศึกษา (สหสาขาวิชา) สหสาขาวิชาเอเชียตะวันออกเฉียงใต้ศึกษา
บัณฑิตวิทยาลัย จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2566

Thesis Title	ASSESSING THE LEVEL OF PARTICIPATION OF SMALL STAKEHOLDERS IN INTERNATIONAL WATER MANAGEMENT PROJECTS FOR FOOD SECURITY IN LOWER MEKONG BASIN: THE CASE OF RICE PRODUCTION IN THE KHONG-LOEI-CHI-MUN PROJECT
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เพาไลน์ เอสซูรี : การประเมินระดับการมีส่วนร่วมของผู้มีส่วนได้ส่วนเสียรายย่อยของท้องถิ่นในโครงการบริหารจัดการน้ำระหว่างประเทศเพื่อความมั่นคงทางอาหารในลุ่มน้ำโขงตอนล่าง: กรณีศึกษาของการผลิตข้าวในโครงการ โขง เลย ชี มูล. (ASSESSING THE LEVEL OF PARTICIPATION OF SMALL STAKEHOLDERS IN INTERNATIONAL WATER MANAGEMENT PROJECTS FOR FOOD SECURITY IN LOWER MEKONG BASIN: THE CASE OF RICE PRODUCTION IN THE KHONG-LOEI-CHI-MUN PROJECT) อ.ที่ปรึกษาหลัก : ผศ.ศุภวรรณ วิเศษน้อยปร.ด.

โขง-ชี-มูลเป็นโครงการชลประทานที่ดำเนินการแล้วบางส่วนในภาคตะวันออกเฉียงเหนือของประเทศไทยภายใต้แผนพัฒนา “อีสานเขียว” โดยรัฐบาลไทยได้รื้อฟื้นขึ้นในปี 2555 และใช้ชื่อใหม่ว่า “โขง-เลย-ชี-มูล”โครงการขนาดใหญ่ใหม่นี้มีจุดมุ่งหมายเพื่อปรับปรุงการเข้าถึงน้ำในภูมิภาค เพื่อเพิ่มการผลิตข้าวทางการเกษตรและตอบสนองความต้องการอาหารที่เพิ่มขึ้นทั่วโลกอย่างไรก็ตามความเหมาะสมของแผนการโครงการในภูมิภาคดังกล่าวถูกวิพากษ์วิจารณ์ว่าขาดการบูรณาการความรู้ภูมิปัญญาในท้องถิ่นซึ่งเป็นสถานการณ์ที่สามารถหลีกเลี่ยงได้ด้วยการสนับสนุนการมีส่วนร่วมของตัวแทนท้องถิ่นในกระบวนการตัดสินใจ การศึกษาชิ้นนี้นี้มีวัตถุประสงค์เพื่อประเมินว่าโครงการโขง-เลย-ชี-มูลเหมาะสมที่จะตอบสนองต่อการผลิตอาหารและความมั่นคงในภูมิภาคหรือไม่และมีส่งเสริมการมีส่วนร่วมในท้องถิ่นในแผนการจัดการด้วยหรือไม่โดยวิธีที่ใช้ในการศึกษาได้แก่การรวบรวมข้อมูลผ่านการทบทวนวรรณกรรมรวมถึงรายงานเกี่ยวกับการพัฒนาโครงการต่างๆและการสัมภาษณ์ผู้ให้ข้อมูลหลักจากผลการศึกษาการส่งเสริมการเพิ่มผลผลิตข้าวโดยใช้ระบบชลประทานไม่สามารถรับประกันการพัฒนาที่ยั่งยืนของภูมิภาคและเกษตรกรได้เนื่องจากได้รับผลประโยชน์ด้านต้นทุนและขีดจำกัดของแหล่งน้ำอีกทั้งความมั่นคงด้านอาหารยังถูกจำกัดเนื่องจากมูลค่าพืชผลต่ำและโครงการขนาดใหญ่ซึ่งเป็นประโยชน์ต่อคนส่วนน้อยในภูมิภาคเท่านั้น การมีส่วนร่วมที่ได้รับการส่งเสริมใน โครงการโขง-เลย-ชี-มูลแต่เฉพาะภายใต้รูปแบบของ ‘การสื่อสาร’ซึ่งเป็นระดับการมีส่วนร่วมที่ต่ำสุดและไม่มีการจัดสรรอำนาจให้กับกลุ่มและผู้แสดงในท้องถิ่นการยอมรับภูมิปัญญาท้องถิ่นจะเป็นองค์ประกอบที่สามารถเพิ่มการมีส่วนร่วมในการมีอำนาจตัดสินใจได้อย่างไรก็ตาม ความรู้หรือภูมิปัญญาท้องถิ่นมีความแตกต่างกันในการเป็นที่ยอมรับและยังเป็นเรื่องยากที่จะตัดสินว่าความรู้ใดที่เกี่ยวข้องมากที่สุด และใครควรเป็นผู้จัดการการศึกษาครั้งนี้เน้นไปที่ความเข้าใจในชุมชนท้องถิ่นและรูปแบบการผลิตทางเลือกที่หลากหลายขึ้นเพื่อตอบความมั่นคงด้านอาหารและการพัฒนาที่ยั่งยืน

สาขาวิชา	เอเชียตะวันออกเฉียงใต้ศึกษา (สหสาขาวิชา)	ลายมือชื่อ นิสิต .....
ปีการศึกษา	2566	ลายมือชื่อ อ.ที่ปรึกษาหลัก .....

6588032020 : MAJOR SOUTHEAST ASIAN STUDIES
KEYWOR
D:

Pauline Essouri : ASSESSING THE LEVEL OF PARTICIPATION OF SMALL STAKEHOLDERS IN INTERNATIONAL WATER MANAGEMENT PROJECTS FOR FOOD SECURITY IN LOWER MEKONG BASIN: THE CASE OF RICE PRODUCTION IN THE KHONG-LOEI-CHI-MUN PROJECT. Advisor: Asst. Prof. SUPAWAN VISETNOI, Ph.D.

The Khong-Chi-Mun was a partially realized irrigation project in Northeast Thailand under the “Greening Isaan” plan of development. Afterward, the Thai government revived it in 2012 under the new name “Khong-Loei-Chi-Mun” (KLCM) This new mega-project aimed to improve water access to the region to increase agricultural rice production and answer to a rising worldwide food demand. However, the suitability of such a plan for the region was criticized for the lack of integration of local context and knowledge, a situation that could be avoided with the participation of local representation in the decision-making process. This study aimed to assess if the KLCM is fit to answer to food production and security in the region, and if local participation was promoted in the management plan. The data collection methodology was separated into two steps, first with a literature review of reports on the project development and second, interviews with key informants. Based on the results, it was observed that the increase of rice yields by using irrigation and second crop systems could not guarantee a sustainable development of the region and farmers, due to the cost-benefit and the strain on water resources it led to. Food security was also limited due to the low value of the crops and the large scale of the project that only benefits a small portion of the producing actors in the region. Participation was promoted in the KLCM, but only under the form of ‘communication’, the lowest level of participation, no power was allocated to local groups and actors. The recognition of local knowledge would be an element that could increase the possibility of small-stakeholders and farmers' participation. However, the local knowledge lacks recognition in front of academic ones. Furthermore, it is still difficult to determine which is the most relevant, and who should handle it. This study is set into a wider range of understanding local communities and alternative forms of production to answer Food Security and Sustainable Development.

Field of Study:	Southeast Asian Studies	Student's Signature .....
Academic Year:	2023	Advisor's Signature .....

ACKNOWLEDGEMENTS

This research is not the result of my work only, and would not have been achieved without the help of Mrs. Supawan Visetnoi, my advisor since the research began. Her advice and knowledge were essential to challenge my work and improve my understanding and criticism of the topic.

I would also like to thank my Committee members Dr. Kanokwan Manorom and Dr. Saikaew Thipakorn who guided me on how to approach my topic and better my findings.

I give special remarks to Mrs. Pimchanok Kutchon, staff at the Southeast Asian Studies Program, for all her support in organizing this research and enthusiasm in helping students. I support all my classmates in the same way they supported me in this research, hoping for them to be successful in the future.

My family was the emotional strength needed during this degree, and they helped more than they can think, thank you to Karim and Sandrine Essouri, my parents for their constant presence. And I will always be grateful to Manon Essouri, my twin sister, for her availability to share excitement and hardships.

Pauline Essouri

TABLE OF CONTENTS

Page

LIST OF TABLES

Page

LIST OF FIGURES

Page

LIST OF ABREVIATIONS

ADB	Asian Development Bank
AIP	Agricultural Innovation Platforms
ASEAN	Association of South East Asian Nations
AWM	Agricultural Water Management
CC	Climate Change
CSO	Civil Society Organizations
DNPWPC	Department of National Park, Wildlife and Plant Conservation
EIA	Environmental Impact Assessment
FAO	Food and Agriculture Organization
FS	Food Security
GFSI	Global Food Security Index
GMS	Greater Mekong Sub-region
GR	Green Revolution
IA	Integrated Assessment
IWRM	Integrated Water Resources Management
KCM	Khong-Chi-Mun
KLCM	Khong-Loei-Chi-Mun
LMB	Lower Mekong Basin
MDGs	Millenium Development Goals
MRC	Mekong River Commission
MSI	Multi-Stakeholder Initiative
NGO	Non-Governmental Organizations
OAE	Office Agricultural Economics
OECD	Organization for Economic Co-operation and Development
PD	Peaceful Demonstration
PIA	Participatory Integrated Assessment
PM	Participatory Mapping
RID	Royal Irrigation Department
SEA	Strategic Environmental Assessment
SD	Sustainable Development
SDGs	Sustainable Development Goals
WEF Nexus	Water-Energy-Food Nexus

Chapter 1

Introduction

1.1. Rationale

With the Green Revolution (GR), the Lower Mekong Region experienced important development in the agriculture fields, either in the improvement of the mechanization of production, or in the adoption of economics and development policies. In the pursue of efficient agricultural development, Thailand's government launched the "Khong-Chi-Mun" (KCM) megaproject in 1992, which would provide the Issan region with water directly deviated from the Mekong River. The potential irrigation under the project was praised, with an initial possibility of 12% of total arable land in Northeast Thailand, and after revisions, the numbers went up to 30% (Philippe & François, 2007). This increased number explained the growing price of the project with the construction of new units, leading to more cost than benefits.

The social and environmental consequences due to a lack of assessment of the project were also non-negligible, 15 120 families were displaced by the different dams that were built under the project, biodiversity bodies like the Rasi Salai forest were destroyed, and the induced salinity increase burned river dependent fields of agriculture (Kerry Lee, 2005). On the transboundary and international level, the project was also heavily criticized by downstream countries like Vietnam and Cambodia that would experience disruption in river flows and could increase their vulnerability to water insecurity (Chris, 2003). After these events, the project was promoted back at the end of 2010's under the name "Khong-Loei-Chi-Mun" (KLCM) as the Loei River was integrated into it. The project would benefit the local farming communities by raising their average annual incomes from 6,478 baht to 37,944 baht.

Other fields of activities like industry, tourism and livestock (RID, n.d.). The question is to see if authorities learned from the previous projects and will develop a sustainable management of water resources to support agricultural production.

It has been proven that small to medium scale rice farms are still prevalent in Thailand and Laos (Arunee et al., 2023). This significant share of farmers is asking for representation during projects and policies development as they are the first impacted actors. In Thailand, farmers' organizations came out since the middle 50s, with the goal to reach better "sufficiency" in production. They are composed of the same region farmers and homogeneous agricultural production that will promote cooperation between them to regulate local farming, create and spread knowledge and reach self-reliance. Nowadays, they are recognized as drivers of increasing local production and eco-social development that can be considered as a move towards a more integrated and relevant approach of new challenges and their management.(Prathanthip et al., 2020), but their presence in certain regions is still lacking, the assessment of their actions still needs to be studied as well as their level of influence over policy setters and decision-making institutions. The involvement of such representation will also increase the complexity of the process as more opinions and information need to be considered before approving projects and policies.

In projects and policies applications, the involvement of every implicated actor is called "participation," but the term is criticized for its large definition that does not give a clear place to all actors and how they should be involved in development based on their legitimacy and power. This "participation" is promoting the "bottom-up- approach in studies and regulation, as we saw in LMB, rice

agriculture is facing numerous challenges, having producers' direct opinions on the needs of improvement can lead to the building of relevant projects. During a study in Laos most producing rice region, farmers were directly asked about the main issues they are facing in the production (wet and dry seasons), even if the pest and insects are the first challenges, water management issues (irrigation, floods and drought) are the second most expressed issues by them with 22% and 24%. Furthermore, in the situation of insufficient production and reliance, 19% of these shortages are due to drought and water-related issues (Silinthone et al., 2020). Water is a central resource in rice production, ensuring a sustainable and regulated access to it can improve the productivity of it in the region. However, the participation of all concerned actors in its management is still questionable. The Nam Theun 2 hydropower project in Laos was criticized for its lack of environmental and impact on local communities' assessments. A Panel of Experts (PoE) was appointed to measure the environmental and social impact of such a large project in Laos rural area, but such participation was limited in diversity of representation and transparency lacking from the government side (Hubbel & Shoemaker, 2018). This example of "participation" highlights the "grey zones" of the concept, as to ask which "participation" is legitimate and if it is representative of the needs and challenges of the concerned region to ensure a sustainable and efficient development. With the KLCM, understanding local demands, environment and impact of the project is crucial to develop sustainable policies around it and to ensure a balanced exploitation of natural resources.

Nowadays, this word "participation" is part of what is considered the "buzzwords" of sustainable development and environmental study (Cornwall & Brock, 2005). They are used to communicate a positive and powerful idea, easily

understood by the targeted public, but far from certain realities of execution. Once again, during the Nam Theun 2 project coordinated by the World Bank, this latter used the term “consultation” to describe partnership with NGOs in building and assessing the project, whereas, NGOs preferred to call it “informational briefings,” a term that emphasizes less on “equity of participation” but more on a “top-down” approach to knowledge sharing (Shoemaker & Hubbel, 2018). Using the term “participation” only is not enough to understand the actual involvement of legitimate actors in projects development, decisions and knowledge. Having more transparency over the process can lead to the creation of sustainable and locally adapted water projects, which will also gain trust from involved actors.

1.2. Dependence over natural resources on LMB

1.2.1. Primary Sector

In the LMB, out of the approximate 65 million people are living along the river, 80% of them are dependent of its natural resources (MRC, 2023). The main population concentration is around the Khorat Plateau and River Delta, where you also have the most important agricultural production of the region (Water Resources, 2003; White Gilbert et al., 2023). A quarter of the region population is still living under the poverty line, the use of natural resources become the main source of incomes for these social groups, agriculture representing around 60% of the regional activity and still being the first tool for economic development, generating environmental pressure and social disparities (MRC). This situation is asking for improvement in agricultural productivity and a better socioeconomic integration of the primary sector workers to reach a sustainable development. In 2013, only 44.7% of northeastern Thailand farmers were solely relying on agricultural activities

incomes, the other half being still dependent on another activity to earn livable ones, and 56.5% of the total farmers were in debt for their agriculture practices (Agricultural Statistic, 2014). Agricultural cooperatives are actors directly involved with Thai farmers integration for decades, a recent assessment of their work proved that their local knowledge and involvement could create services of adaptation to new challenges in the agricultural fields like the lack of labor (because of farmers' ageing and young disinterest in agriculture), limited profitability and increased competition in production. Most of these services were developed based on local knowledge of needs and factors of change, and have two different approaches: collective management of the market or development of independence from it (Faysse & Onsamrarn, 2018).

1.2.2. Water Resources

The LMB is composed of different access to fresh water and hydrological landscapes, first the Mekong River itself, then the Great Lake Tonle Sap region in Cambodia, the largest lake in Southeast Asia, finally the Mekong Delta, in southern Vietnam. Each of this region have their own features and resources that are facing respective challenges.

The main source of water in the LMB is the Mekong River itself and its connected sub-rivers. Except in the Tonle Sap region, its covered area differs with the tropical climate, from 300,000 ha in the dry season to 1,6 million ha in the wet season, increasing the importance of the local biodiversity and the productivity of the region in fishery and agriculture (ADB, 2005). This dependence on natural resources and productivity is one of the key factors to encourage socioeconomic and environmental

sustainability, it is of crucial importance to understand the impact of climate change on the local populations (Lamberts, 2006) to be able to develop adaptable solution. This form of dependence is not only on the resources itself, it also integrates different activity fields. The agriculture sector is one of the main ones, then it can include fishery, hydropower, transport and trade, sanitation and mining activities (Kamoto & Muangpong, 2007; MRC, 2011b, 2021).

The main water-related issue in the LMB is the inadequate supply of it. This situation can be explained by natural and artificial practices and events. First, the altered flow of the river by dams and irrigation leads to water shortage in the Lower region of the river, these shortages are more important during the dry season and increased in severity with CC as drought can last longer than what they used to. This scarcity forces consumers to increase their water withdrawal from reservoir or underground resources, leading to water shortages on multiple levels and sources (ADB, 2011). For example, Lao access to the Mekong River hydropower resources is important and considered underexploited by the national government. This situation is attracting foreign investments from Thailand to develop irrigation and hydropower infrastructure that could answer Thailand's demands in water resources and to Laos economic development. But these projects have a direct impact on Cambodia's and Vietnam's flows of water that will affect local biodiversity, and eco-social development as numerous local farmers (in Cambodia's Tonle-Sap and Vietnam's Mekong Delta) are dependent on their agricultural and fishery production (Sok et al., 2019). Theses shortages prove the necessity of regional collaboration in the region to regulate transboundary issues and share benefits. The issues of water distribution and

access are not only on an international scale, on a smaller level disparity in access to water resources are experienced by farmers and local communities.

1.3. Rice agriculture in LMB

1.3.1. Production and Productivity

In the LMB, the Mekong Delta, Khorat Plateau and Tonle Sap regions are the most important in terms of rice production with around 75% of the LMB total production (Kang et al., 2021; MRC, 2003). During the last four decades, the LMB followed the same pattern in agricultural development, by increasing the use of external outputs, the production of marketable surplus, they got out of the social system of state control over agricultural production and implemented a commercial decision in management. Nowadays, the constant expansion of agricultural land and production to answer the increasing food demand is highly criticized by scholars due to it being unsustainable (Bruges & Smith, 2008), on average, the world food production needs to grow by 60% to answer food demand, and can go up to 100% in some regions. In the LMB, rice consumption was predicted to reduce with economic development and diversification of diet linked to it, but the influence of international challenges like COVID-19, Ukrainian War, inflation and Climate Change are putting pressure to the food production chain to ensure international and regional food security (Sandford, 2022; Sergiy, 2015). But the Food Security does not only rely on the quantity of food produced, it also includes the affordability of it, quality and sustainability of such production. Emphasis is now put on sustainable methods that will increase productivity and not simple production, another term used for such

development is “sustainable intensification,” to answer economic and environmental challenges as well as food demand. ASEAN recognizes in its 2021-2025 Plan of Action on Food Security the necessity of a sustainable food production and productivity, that would be resilient to climate change and not pressuring on natural resources (ASEAN, 2020). An ameliorated productivity method in rice agriculture is by increasing the yields per crops with the minimum use of outputs or other resources in the process. A study done in Thailand’s highlands demonstrate that water management is one of the main variables that could change rice yields, by controlling the exposition of crops to flooding it would prevent the development of diseases in the production, leading to increased yields. (Gbetondji Melaine Armel, 2017) tested the irrigation results in Benin farms, seeing an improved productivity of 57% compared to non-irrigated rice lands. Furthermore, the use of non-flooded methods put less water-access pressures on farmers, reducing their dependence on natural resources and their exposition to uncertain access due to CC (Rungcharoen et al., 2014). Finally, these new methods answers to the farmer’s needs and are developed in cooperation with them, ensuring a trusting behavior over it and a long-term adoption of it. To ensure the efficient development of productivity improvement, integrative and coherent policies surrounding the food supply chains need to be suggested, asking involvement from the decision-making actors and governments.

National and regional economies understand the importance of agriculture in ensuring food security, but farming activities have an extensive nature by relying on different natural resources (water and energy) that will transform the landscape and its biodiversity(De Loe et al., 2015). Promoting the development of productivity and technologies will also increase the production without the increase usage of outputs.

Nowadays, it is recognized that agricultural development is linked to other activity sectors and resource management ones, so understanding development with an integrative approach can lead to a more adaptable management to environmental, economic, and social challenges the need for resources can lead to. The water resource sector and agriculture are interdependent, so it should be their management.

1.3.2. Agricultural Water Management for Agriculture Development

Agricultural Water Management (AWM) is composed of two main types of water use: (i) rainfed cropping and (ii) irrigation cropping. The second one is itself divided into numerous systems of irrigation depending on geographical characteristic, economical ones, labor access and crop diversity. In front of CC, rainfed cropping is a more vulnerable and unstable system to follow (Singh et al., 2013), in the case of Cambodia, 85% of its cultivated lands are allocated to rice production, 90% of it relying on rainfed production (wet-season production), in the Tonle Sap area, around 24% of the rice production is using irrigation systems, whereas Thailand's rice fields are between 50 and 75% irrigated. The first challenge faced by farmers to transit to irrigated agriculture is the lack of allocated credits and labor force. 60% of them are still self-subsistent but cannot increase their production, limiting their socio-economic development and the strengthening of food security in the region (Shean, 2010), the second is the different development and political stability of the decision-making actor (ADB, 2019). Laos agricultural production is also dependent on the rice production (60% of the total). The country landscape is mainly mountainous, restricting the agricultural possibilities of expansion, but it witnessed an increase in rice production thanks to the higher variety of crops and the development of irrigation covered lands (Mullis & Prasertsri, 2020). Only 12% of the paddy superficies is

irrigated, asking for a development of access to this agricultural water system for increased production. Irrigation methods in agricultural development are proven to lead to a better production and be less vulnerable to CC, a situation that can strengthen food security. Government and decision-making actors are understanding such importance, leading to the development of multiple projects in the past decades.

The development of reservoir and irrigation systems for agriculture is increasing in importance in the whole Mekong sub-region, as irrigation increase productivity of rice fields by controlling water output compared to other popular water management in the region, like rain-fed cropping (irrigation can increase paddy production from 35 to 65%) (MRC, 2011a). Each LMB country reached different levels of achievement over it. Thailand and Vietnam are the most advanced compared to Laos that face difficulty with a scarce population and mountainous landscape, and Cambodia due to politic instability (Molle, 2005). More than 70% of the irrigation schemes in Laos PDR are located in seven out of seventeen provinces in the country, all located in the floodplain of the Mekong River (Bounthong et al., 2016). Between 1994 and 2014, the irrigation plans in the country doubled, leading to an important increase in production of wet and dry-season rice. One of the main challenges in continuing the performance of irrigation schemes is the maintenance of these projects, mainly on the large scale. (Junko, 2021; Raveendra Kumar et al., 2017a). The KLCM is one of the last large-scale projects in Thailand, it is planned to use 17 canals from the Loei River to Khon Kaen region (Figure 1). They would divert up to 1.9 billion cubic meters of water per year, 6 million of it are under the Sri Song Rak water gate development (RID, 2023). This latter will be able to cover about 72,000 rai of

irrigated agriculture, approximately targeting 1,800 farms in 7 districts of the Loei region.

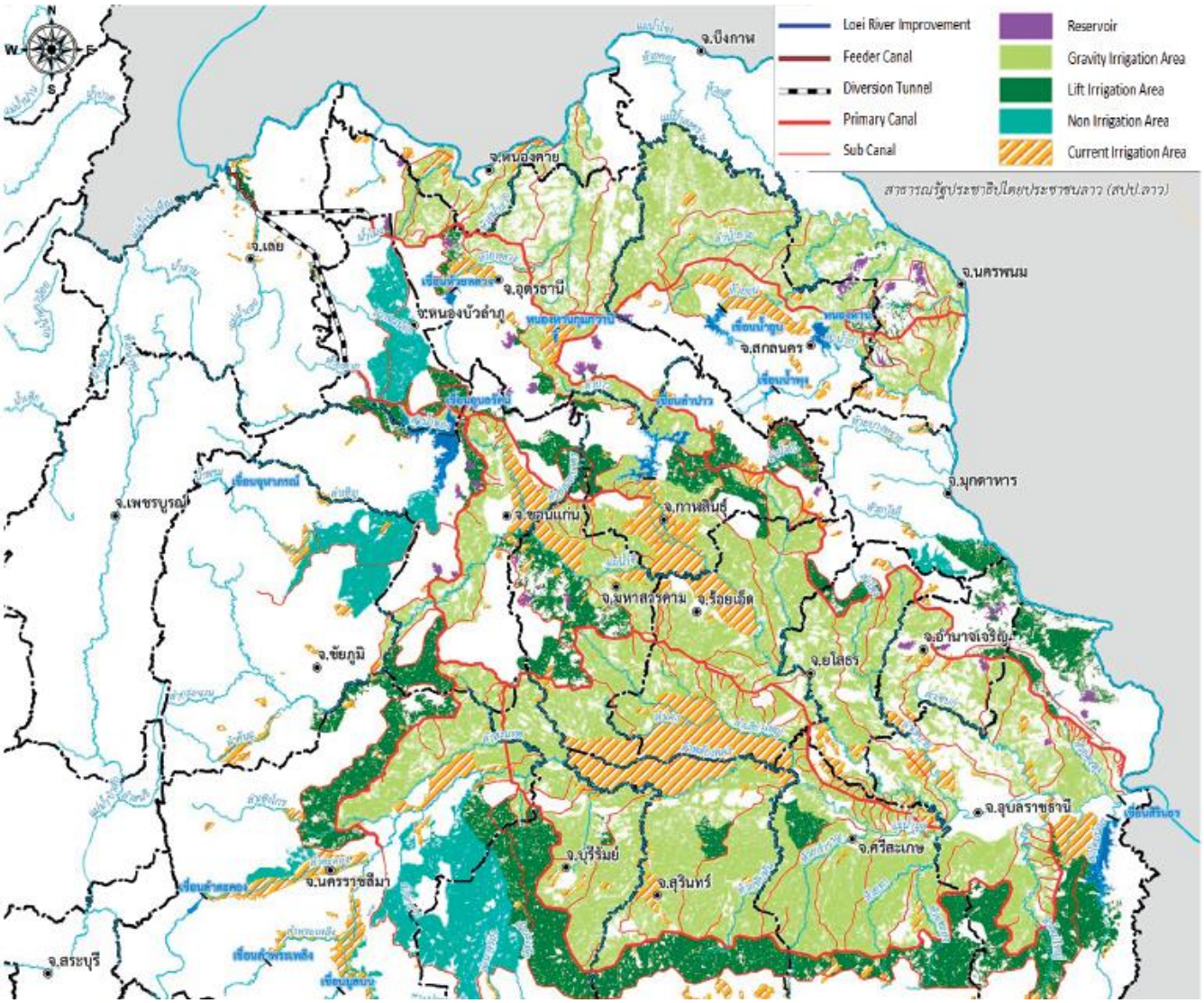

Figure 1 Khong-Loei-Chi-Mun Project and Area

(Panya, 2017)

However, one of the current challenges in the irrigation sector is the lack of assessment and performance evaluation, as the results planned prior to the projects and the difference with the results is still not understood enough, leading to an inadequate agricultural water management (Raveendra Kumar et al., 2017b). The

involvement of multiple concerned actors in the impact understanding of irrigation development can increase the challenge prediction knowledge, but also the trust in them from agriculture producers, answering their interest in the adoption of new farming methods that can enhance productivity. Furthermore, an improved water irrigation system can reduce CC vulnerability, whereas the rainfed method does not (Weaver Thomas et al., 2019).

1.4. Sustainable Development

The concept of "Sustainable Development" (SD) first appeared in the Brundtland Report, 1987. Since the concept gained international recognition and is in the agenda (on national and international levels) of different actors of governance. The importance of SD is not only on ecology, it's also integrating society and its future changes. In total, SD groups three principles that are subject to development: Economic, Environmental and Social. These dimensions need to be in "coevolution" to be successful in a long-term change (Ruggerio, 2021). But nowadays SD is a concept gradually integrated in various fields of study and on every scale, necessitating a particular attention on one issue, limiting the knowledge and reliability of its understanding in the interrelationship between society and nature.

Agricultural water management is more and more impacted by CC, leading to severe floods or/and droughts in some region, asking for a sustainable rethinking of the irrigation systems and not a simple increase of it (Chaudhary & Srivastava, 2021). To reach such changes different interventions need to be done, not only on the irrigation models themselves, but also on the market opportunities for development, on the recognition and implication of informal private irrigation and the protection of

ecosystems (Bounthong et al., 2016). Basing themselves on the Sustainable Development Goals principles, different actors of the region are developing approaches to reach a sustainable use of resources for sustainable agriculture.

Facing this interrelation of societal and environmental issue, the Sustainable Development Goals (SDGs) were put together by UN in 2015, following the not so successful Modern Development Goals (MDGs) (Independent Group of Scientists appointed by the, 2019). They are defined as goals to reach in a way to ensure a successful future sustainable development, compiling a total of 17 goals that need to be achieved by 2030. Some scholars do think that the knowledge on each of the goals and their interdependence is still limited and needs improvement to fully apply the framework (Filho et al., 2018). As it can be seen (Table 1), however, it is still difficult to understand which actors are actively involved in data development and share.

Organizations

International Organizations over SDGs in Southeast Asia	ASEAN	MRC	UN Food and Agriculture Organization (FAO)
Vision	Vision 2025	Basin Vision	Sustainable Development Goals
Approach	Improve financing Information	Promotion of strategic fields of development: - Environment - Social	Integrated strategy to monitor SDGS: - Development of national indicators

	sharing and capacity building Cooperation of different actors	- Economic - Climate Change - Cooperation	following SDGs framework - Development of new methods of data collection - Review of relevant data production - Use indicator in decision-making - Strong understanding of each country's database
Limits	Lack of information over the success of it or not No transparency in the cooperation of actors and information origin.	Relies on modernization, expansion and development, approaches that are criticized by academics for not proving to be sustainable and long-term result wielding.	Lack of involvement from some countries as 40% did not improve their statistical capacities since 2010

Table 1 Sustainable Development Approach in Southeast Asia International (Gennari et al., 2019; MRC, 2021; OpenDevelopement, 2018; United, 2017).

1.5. Cooperation for Sustainable Development

In its entirety, the Mekong River groups China, Myanmar, Laos, Thailand, Cambodia and Vietnam. It is then divided into two sub-regions: upper-Mekong and Lower Mekong. In the Lower Mekong Basin, MRC and ADB are two main actors in the international cooperation over Water Management, and GMS is a program launched under ADB to focus on the importance of cooperation in trade and communication in the region (Verbiest, 2013).

The attention given to multi-levels and field stakeholders is increasing in the academic and managing fields of water and natural resource governance, for example SDGs 17 promotes “Partnership for the Goals” and the IWRM approach followed by MRC promotes knowledge building and communication with stakeholders for an effective management. The inclusion of external stakeholders, mainly if they are of an external position in the Basin, is also subject to interest unbalance, as they are prone to focus on environmental issues compared to economic gain from project development. Or, with the example of China, the country emphasize on geopolitical interest in water resources, but not on equitable distribution of resources (Offerdal, 2019; Verbiest, 2013). So, the involvement of external actors does bring more expertise and understanding of the different dynamics of management, but it also bears more complexity to the process. Knowing such a situation, one of the main critics given to MRC and GMS is still the lack of participation on multiple levels.

Stakeholder participation is still questioned as their legitimacy to understand small-scale concerns are recognized, but the importance given to it is still difficult to gage (Masashi, 2022). In the MRC management process, a place is given to these

non-governmental actors, but they are only allocated a six-month time frame to gather representant and knowledge before discussion of a project, a time allocation considered too short to be fruitful to the stakeholders and local community interests. Furthermore, the position held by communities and state-holder post-plan discussion is insufficient as the projects are handled by governments and other actors in foreign countries. The only position the MRC can take in these project is to ensure the well-being of local groups and their needs by being a mediator for local NGOs.

1.6. Food Security

At the moment it can be questioned if the national policies can answer local demands and needs, and what is the level of inclusion of small-scale actors in decision-making over the development of Food Security? Numerous literature and theories are being built over the topic as the increasing demand for food, the vulnerability of production over CC and the interconnectivity of the market are weakening the consistency of a food-secure population.

In the academic field, you have an important panel of measurement systems over Food Security, for example, the Global Food Security Index (GFSI) is to measure factors that lead to food security, when most of the other measuring tools assess the outcomes of food consumption (Izraelov & Silber, 2019). The SDGs 2 “Zero Hunger” set up a different target for the development of a secure and sustainable food production and productivity worldwide, in which targets 2.3 and 2.8 accentuate the focus on the role farmers should take into reaching the goals, like knowledge building, opportunities on value addition or access to market information. SDG 2 was proven to not be reachable when policies are only applied on large-scale

and for national changes, but the relevant and contextual policy setters are lacking in "strategic capacity," asking for a build-up of it at local levels (Blesh et al., 2019). Past agriculture development towards reaching SDGs 2 relied more on agriculture extension, proven to not be sustainable on environmental, social and economic levels, on the other hand, the importance of development is put on: place-based policies, adaptation capacity, participatory, multi-challenge integration and quality of diet (Blesh et al., 2019; Fontana & Oldekop, 2020). However, the term "participatory" is still a controversial one, as being participative can be claimed by everyone without giving a form of empowerment (Bruges & Smith, 2008). Most of these theoretical frameworks do not include the collaboration aspect into reaching Food Security and policy-makers assessment. The only one including these principles would be the SDG 17, with the targets 17.G and 17.H, but once again the definition of partnership is not defined and limited, leaving to each institution the choice over involvement of multiple actors in the decision-making process. Following all these theories over Food Security and its measurement, the situation of the LMB can be visualized.

Government needs to focus their national policies on the use of such resources to limit environmental, social and economic impact in the future. Cooperation between concerned actors is seen as one of the most effective approaches to have an integrative understand of the local dynamics and challenges, but the knowledge over the recognition and level of participation of these actors is still limited.

1.7. Research Questions

a. What is the KLCM level of sustainability in water management related to rice production and food security?

b. What is the level of participation and integration of stakeholders in the International Cooperation in Water Management and Agricultural development in the KLCM?

c. Does cooperation give power to the multi-stakeholder in knowledge building and decision-making process in management?

1.8. Research Objectives

a. To assess an irrigation project in the Lower Mekong Basin region, in relation to their achievement in water sustainable management and food security.

b. To investigate the roles of small stakeholders in developing sustainable water management projects for rice agriculture.

c. To study small stakeholders' participation in decision-making processes and how "empowerment" principles are integrated.

1.9. Keywords

Lower Mekong Region, Khong-Loei-Chi-Mun, Rice production, Food Security, Water Management, Stakeholder participation

Chapter 2

Literature Review

2.1. Challenges in Managing Resources in Thailand

2.1.1 In practice

In terms of practice, the switch from rainfed to irrigated farming technique, is recognized to ensure a higher productivity with water efficient/security as long as water waste is controlled to prevent energy consumption cost and resources waste (Singh et al., 2013; Weaver Thomas et al., 2019). Successful irrigation systems are expected to reduce the quantity of water needed for a larger area of cultivation, a system that will raise farmers' incomes due to less cost[1] of production and larger quantity of produce. However, such formalized systems of irrigation are complex to put together not always trusted by local farmers.

On the other side, instead of a following irrigation promotion some experts recommend that the local context and development should also be considered, and that the focus on improving efficiency of rainfed rice cultivation is relevant to small rice farmers. So improving these methods of agriculture should also be considered in development policies and projects (Abha et al., 2021). This recommendation is encouraged by the reduction of CC risk exposition it could ensure and the economic status of practicing farmers that would increase following a sustainable pattern.

Furthermore, the newly claimed policies have a tendency to focus on one aspect of development, and will lack of multidisciplinary engagement (Chayanid,

[1] Crop yields are the difference between the price of inputs and outputs in a yield, to estimate its economic value.

2021). (Kerry Lee, 2005) But this pattern is not specific to policies, as the whole study over Sustainable Development are recommended to include a multidisciplinary approach, that complexify the process of knowledge creation (Scott, 2017).

2.1.2 The Advantages of Less Water

In their study (Abha et al., 2021) gathered concerns from Mekong rice farmers for 5 years: their main development goals are not an increased access to water but the reach of higher yields with fewer inputs. These would reduce costs, time and labor and would ensure profits. Water is one of the elements of production, but not the only inputs necessary to increase yields with reducing cost, all in a sustainable way. On the contrary, studies proved that the reducing of water use could increase yields quantity as long as they follow good "management practice" and the use of Alternative Wetting and Drying system is gaining in popularity in the limited inputs necessary (Alexander et al., 2018; Chaudhary & Srivastava, 2021; Raveendra Kumar et al., 2017a), a position also supported by some NGOs and experts interviewed for this research. Between 1980-201, the increase of dry season production in rice with irrigation went from about 11% to 32% in Thailand. But the Central region experienced a 30% increase whereas Northeast region 5%, meaning that the issue in the region is not simply the access to water resources (Pichayanun et al., 2021) (other potential variables: varieties of rice, fertilizer use, planting method, extension method and farm harvest price and export values, lack of policies regarding agriculture productivity).

2.1.3 Organizational and Institutional Challenges

Thailand has an important number of offices that are responsible and involved in the country's management of water resources, with a total of 38 agencies. Such number complicates the achievement of cohesion in water management, a situation described as: "too many fingers in too many pies" (Chayanid, 2021; Nawarat, 2018). For example, RID wants to maximize agricultural yields via irrigation schemes while the Department of National Parks, Wildlife and Plant Conservation (DNPWPC) has a mission to preserve lands and forests, that can be targeted by these irrigation construction projects. In front of this lack of prevailing allocation philosophy, you have a result of overlapping conflicting interests, turf battles.

The hierarchy intern to a department office is also a challenge, each project is divided by offices, inducing lacks in information relay and conflict of opinions and management between departments. Due to its importance for the RID as a "mega" and Royal project, the KLCM develop is even more subject to subdivision as it is the compilation of multiple constructions under different regional offices.

For (Chayanid, 2021), the fragmentation is not only "vertical" (following a hierarchical model from the highest to lowest authority), it is also "Horizontal" as the decentralization of power is incomplete in the system, leading to a lack of cooperation between the management actors. This incomplete process is explained by:

1. Decentralization is an expensive process.

2. The resources targeted (in this case: water) are scarce and of different important for each region and their development, leading to a difficult handling of them.

2.2 Participation for Sustainable Adaptative Agricultural Production

The ideal of participation in project decision-making processes and management as seen long been recognized and promoted. On an international level, MDGs 8 and later SDGs 17 both are goals of partnership. On the regional level also, you can see a promotion of small-scale actors' involvement in decision and knowledge building. The private sector is also recognized as an important actor in resource management (ADB, 2011; Yun et al., 2017). So, there is a promotion on two different types of the participative actors: different scales ones and different sectors ones.

In its research over the definition of "participation" in the lexical field of involvement and decision, Palash Kamruzzaman (Kamruzzaman, 2020) wants to remind readers that a misconception of "participation" is being spread by governments, NGOs and other powerful actors, describing it as a way to "give a voice" to undervalued actors. Kamruzzaman draws a line between "participation" and "empowerment," as participation does not lead to the final decision power. In parallel to this idea, we can see the previous seen concept of "Accesssibility to actors" and "importance of actors" that are two different places given inside the lager idea of "Participation." Giving actors a role and giving them significance do not require the same efforts.

2.2.1 Recognition of Local Knowledge

Seen through the IRWM and WEF Nexus, participation of stakeholders and other small-scale actors have always been encouraged by researchers and other groups involved in the water resources management and promotion of Sustainable Development. Different factors can lead to an efficient participation and empowerment of local communities and stakeholders, and it needs first to pass by the understanding of these new actors' position in the process.

This promotion of participation is criticized for being emphasized without a concrete application of it as the "top-down" approach in policy making is still followed, leading to a lack of trust from smaller actors towards the important ones (International Water Management, 2006). Some researchers argue that a "top-down" approach is too limited in the understanding of the context, it needs and challenges, recommending changing towards a "bottom-up" one, where the knowledge will mainly be given by local communities and stakeholders to build up fitted management (Kusnandar et al., 2019). "Top-down" or "bottom-up" can be seen as two extremes, as one is lacking in local knowledge but the other one cannot integrate academics understanding of an issue and can be limited in the integration of different variables that are not perceptible on a local level only. At this moment, we can see an increasing recommendation by scholars to use the two approaches in a balanced way (Ranjan et al., 2013), but we can question who will produce which knowledge, how to assess its importance in the decision-making process, and who will still have the final decision ? Norman Uphoff (Uphoff, 1992) argued that even if the local knowledge is necessary, it can only be efficient if the resources are predictable, and in front of the increasing variability of CC, then the local understanding can be irrelevant or limited.

Furthermore, the implication of local actors also relies on their interest of project development and participation.

To build up sustainable development of the agriculture field and implement it, it is necessary to understand the farmers and stakeholders' perception of such a concept. Yan Ma explained that the motivation of local farmers is a key factor in their implication of sustainable development in agricultural practices (Yan et al., 2009). The research shows the relation between economic development and the application of sustainable practices. As the farmers were gaining more incomes, their socio-economic status increased and their access to knowledge and education level, leading to a willingness to use SD practices. However, it shouldn't be omitted that other studies demonstrate that an increased education level could lead farmer's population to leave the agricultural sector to work as labor in urban settings, where incomes are more important. Tizian Gomiero (Gomiero et al., 2011) wants to remind us that the multifunctional nature and multi-scale level of sustainable agriculture plus the lack of clear definition of "Sustainable" makes the interpretation highly different between groups, and that no solution will be able to answers to every actor's goal.

2.2.2 Position of Local Actors and Stakeholders in Decision-Making

Table 2 Water Governance Division of Actors

	Public	Private
International	Donor Agencies	International NGOs
National	Central governement, Ministries	NGOs, Corporations
Regional	Regional Governement	Regional Federation, Regional Corporative, Regional NGOs
District	District Administration	District Firm, Charitable Organizations
Local	Division council, Village council	Local business, local association, religious association
Household	Citizen	Client

(Uphoff, 1992)

When talking about small-scale actors and participative approach, a difference needs to be made between "local communities" and "stakeholders" as they don't necessarily belong to the same scale and sector. Norman Uphoff criticized the general idea of considering everything that is not national as local actors. All local actors are from a small-scale of representation but not all of them are farmers (Dlouha et al., 2022), they can come from the private or public sectors, they can be Non-Governmental Organizations (NGOs), communities or association.

Between local actors and stakeholders, the need to differentiate private and public is important to understand each position and roles (Table 2.). In the governance of sustainable development and production, the private sector is gaining importance in front of the government failure, represented by the stakeholders that created "Multi-Stakeholder Initiatives" (MSIs) (Cheyns, 2011; de Bakker et al., 2019). These

initiatives are built up on a balanced and participatory approach of environmental responsibility.

Some research will encourage the development of public knowledge and actions, as it can have a direct impact on promoting the economic and environmental development of a region and its sustainability level (Ranjan et al., 2013). On the other side, a third institution was developed, creating a “Private, Public and Participatory sector” (Uphoff, 1992). This “Participatory Sector” is based on common interest and flexibility in decision-making, leading to a better inclusion of different factors, actors, and their motivations. The issue is how this new sector can be recognized by the private, public and the academic actors, and its implementation in the decision-making process is still unsure.

The importance and relevancy of local actors, especially farmers, are recognized and to further develop their participation in decision-making processes, academic papers tend to all agree on the promotion of coordination in their organization to develop a trustable expertise and management (Speelman et al., 2014). “Group value” is a process that can extract and define objectives and priorities, leading to a “Mutual Trust” in representation and knowledge building (Bruges & Smith, 2008; Uphoff, 1992). The issue with the promotion of this “Group value” is the emphasis that is putting on “Bottom-up” knowledge building, discarding the “Top-down” approach, and as seen previously, a balanced use of these two systems is the most encouraged one to reach long-term sustainable agriculture and resource management.

Recognizing position and importance in participation is promoted, but how is the legitimacy of local actors and stakeholders assessed? Following Emmanuelle Cheyns's study, to be recognized by the decision-making scene, stakeholders need to answer three criteria: (i) they need to defend an interest (ii) they need to belong to an interest group and (iii) they should be able to "balance" their representation of the said group. These qualifications are not applied to local communities or small stakeholders because they are not recognized as "groups." And such criteria do not prevent the stakeholders to be represented by larger scales instead, like social NGOs. In the group of MSIs, most of the stakeholders, even if multidisciplinary in the background, are coming from a management field and no other sectors were legitimized (de Bakker et al., 2019). At this moment the literature is showing how the MSIs still have unbalanced and variable position in the decision-making scene. Furthermore, the MSIs legitimacy in the process is to build up on the "legitimacy theory," where stakeholder take active part in action towards the reach of SDGs by reporting their own involvement and creating a form of transparency. However, it was proven in certain cases that 90% of their failures and "bad events" were omitted in reports (de Bakker et al., 2019; Silva, 2021).

2.2.3 Empowerment and Participation

"The process of helping individuals, families, groups, and communities increase their personal, interpersonal, socioeconomic, and political strengths and develop influence toward improving their circumstances."

(Barker, 2014). This definition of the term "empowerment" focus on the increase of communication between communities and external actors to reach a

certain level of rights. Whereas, a second definition emphasis the control of a community resource by the gain of rights and power (Lyons et al., 2001). In the first one, empowerment is a target whereas a means in the second. This study will focus on the use of “empowerment and participation” as a tool to reach a sustainable management of agricultural resources.

In the literature, empowerment is recognized as an efficient way to reach “meaningful” participation for any marginalized communities, Jethro Pettit even qualify “empowerment” and “participation” as two complementary principles that are means and ends. But due to it asking for important changes in power relations, it needs to be developed with a multi-sector and multi-level approach to be the most efficient. For example, social discrimination needs to be minimized with changes in laws, small producers and farmers’ needs to have their accessibility to the market increased and political voices of small-scale representatives should be strengthened (Anuyah et al., 2023; Jethro, 2012). When putting emphasize on local studies and actions, the state still has importance as it remains a leader in general knowledge building and communication, a change on a local scale will not affect national development and systems except if large-scale actors are involved (Mohan, 2006). A state-centered approach of project management follows a “top-down “dynamic, whereas a local centered one is “bottom-up.” To reach an efficient empowerment, selective interpretation and critical awareness are needed to understand the gap in current situations. So, a “bottom-up” focused approach only would not be sustainable. This latter has been promoted by scholars in front of lack of transparency in the “top-down” approach, but relying on one over another is too restrictive to understand good and bad practices, and to criticize them (Jethro, 2012; Mohan, 2006). To encourage a

balanced involvement of relevant actors, their “participation” in projects is necessary and promoted by international organizations and experts, but such a term is wide in its definition, and does not fully recognize the importance of involvement of an actor.

A difference needs to be made between using the term empowerment and participation together and actually applying it in policies and action. The statement of intents and the implementation of such words are two different principles that can lead to misunderstand of one’s purpose (Cornwall & Brock, 2005). Oghenemaro further emphasize the two dimensions of empowerment, as one is the development of autonomy and the other the increase of self-esteem, this latter is not a process in decision and action, but only a feeling.

2.3 Leveling Participation: from “participation” to “collaboration”

2.3.1 Reviewing the Concept of “Participation”

Traditional methods of understanding and management of environment and natural resources will follow “Top-down” approaches that were proven to be limited in understanding local challenges and non-adaptable. As seen previously, the need for new knowledge, local understanding and management is important to develop sustainable resource use and production. The concept of participation has long been promoted in the theoretical aspect of management and knowledge building development, as it can help reach efficiency and equity in the practice, on the long-term it can also enhance an ameliorated maintenance of projects that includes direct beneficiaries in their creation and their assessment (Molle, 2005). In her study assessing participatory approaches, Meghan Mussehl (Mussehl et al., 2023), all

participants recognized the importance of “community ownership” and their representation in the decision-making process, and 20% of the interviewees during the research set it at the first objectives to increase community involvement. The recognition of local communities and their importance in cooperation for project development in the sustainable development fields is difficult to question. But the definition of “participation” itself is more and more questioned as it can be considered not specific enough to describe the range of positions communities and stakeholders can take in decision-making processes and how such position can impact on the success of project development.

The knowledge over the complete impact and benefits of involving small stakeholders and local communities in the decision-making process and formulation of policies is still limited to the “awareness” level of involvement. A definition of “stakeholder engagement” given by OECD is “any person or group who has an interest or stake in a water-related topic is involved in the related activities and decision-making.” This definition does not cite the level of legitimacy of one actor over another, putting every concern and knowledge on the same level (Akmouch & Clavreul, 2017). A framework was then developed by the same organization to classify engagement levels of stakeholders and their intentions over water management in six different categories, from “Communication” to “Co-decision and co-production” (OECD, 2015). Such a framework gives a specific definition of the term “participation” that is more and more recognized as different from “Collaboration” in a cooperation management process. A participative engagement from actors will increase the knowledge building, but stakeholders have a consultative role. Whereas, the collaboration engagement gives management responsibilities to

stakeholders (Shrestha et al., 2021). But, in the theoretical field of assessment, the difference between participation and collaboration is gaining importance.

The Integrated Assessment (IA) came out and became popular in the 90s, recognizing the participation of stakeholders and local actors in the decision-making process. Including them was also complexifying the assessment works and understanding of interdisciplinary relations as the scope of variables was larger, leading to a creation of models to deal with such a complex framework. However, these models didn't take into account the qualitative transformation of society and its motivations, the implantation of public policy issues and the study were more focused on the analyze of quantitative data that was related to natural science (Salter et al., 2010; Villamor et al., 2022). This lack of qualitative inclusion is asking for a new approach in assessment, that lead to the Participatory Integrated Assessment (PIA). The main difference between IA and PIA is the *quality* of participation given to stakeholder and small-scale actors (Li et al., 2015), but some scholars would criticize this participation that is still difficult to assess in its legitimacy and brings research to not follow an impartial position in the study as the advocates for marginalized actors positions (Bruges & Smith, 2008). Participation of small-scale stakeholders and local representation in water management decision-making is still a developing concept that is not understood in two parts: the quality of it and the legitimacy of small stakeholders in management.

2.3.2 Legitimacy of Participation

With the economic development and the rising food demand, water management is needed an increased adaptable governance over it. A situation that can

overwhelm government capacities is setting up policies and public funds. Furthermore, the standards set up by the Sustainable Development's Goals and the IWRM in water management are asking for adaptability of governance, asking for new approaches and involvement in key actors (Akmouch & Clavreul, 2017). The engagement is already here, but not from the beginning to the end of the management process, it can be criticized that it is state-oriented and state-initiated. In her research, Meghan Mussel stand to the point that the inclusion of small actors will give them legitimacy that will lead to a trust in future projects and the spike of interest from beneficiaries in adopting these plans. But, as most of these stakeholders are not legal entities, they need to rely on the decisive power to gain legitimacy (Ratner et al., 2022). Still, some scholars want to remind us that the field of small-stakeholder participation study is still lacking in critics towards these new actor's involvement, leading to a biased understanding of their roles and responsibilities (De Loe et al., 2015). Overall, recognizing the legitimacy of small-scale stakeholders and local actors in water management for sustainable agriculture is seen as a way to adapt policies and action plans to know worlds dynamics and adaptability required. But the recognition of these actors from national governments is still low, or limited to some area of management, not leading to a form of empowerment that can enhance sustainable development.

SDG 2 was proven to not be reachable when policies are only applied on large-scale and for national changes, but the relevant and contextual policy setters are lacking in "strategic capacity," asking for a build-up of it at local levels (Blesh et al., 2019). Past agriculture development towards reaching SDGs 2 relied more on agriculture extension, proven to not be sustainable on environmental, social and

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2.4 Theoretical Framework

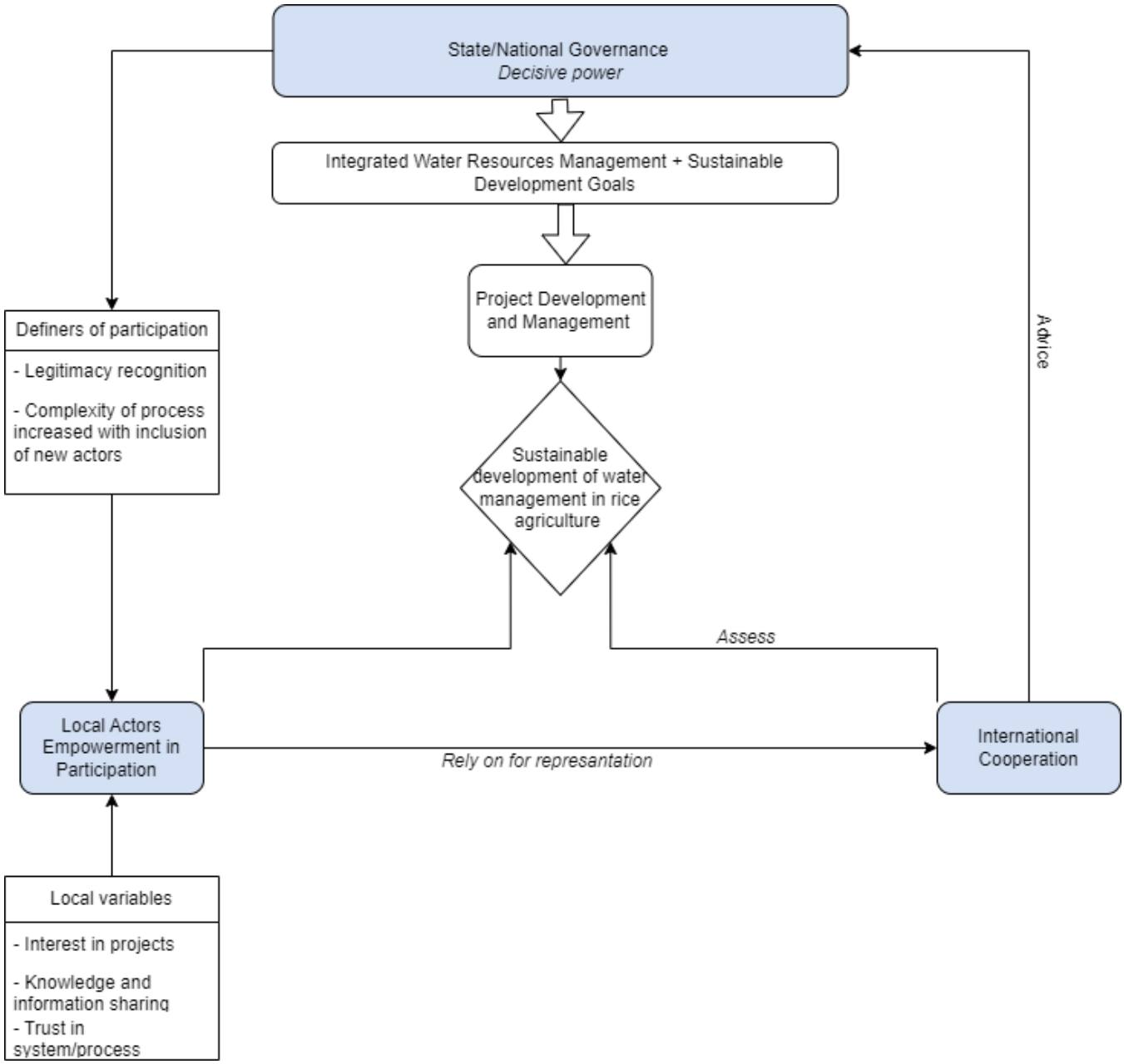

Figure 2 Model of KLCM Actors Roles in Sustainable Water Management

Cooperation to build up a sustainable rice production and water consumption for Food Security is important in the management of water resources. This study was based on the integration of Food Security and SDGs principles in the management and decision-making process of irrigation project to lead to a common and sustainable

development in the LMB region and ensuring Food Security. Assessing the projects with SDGs permitted to understand the position of its framework, the weaknesses, and strengths. Past study has proven that following a “top-down” approach only was irrelevant in understanding local needs and challenges as well as benefits and consequences before and after a project implementation. Local participation was strongly encouraged by different institutions and principles but the measurement of this participation and the local actor’s “empowerment” in it were still lacking in studies. To assess their level of participation, this study based itself on the “Level of Stakeholder engagement” systems developed by OECD (Figure 2), it was used with each actor to position themselves on it based on their past experiences. The goal was to understand each perception of their position in the decision-making and management processes, and to define similarities or divergences.

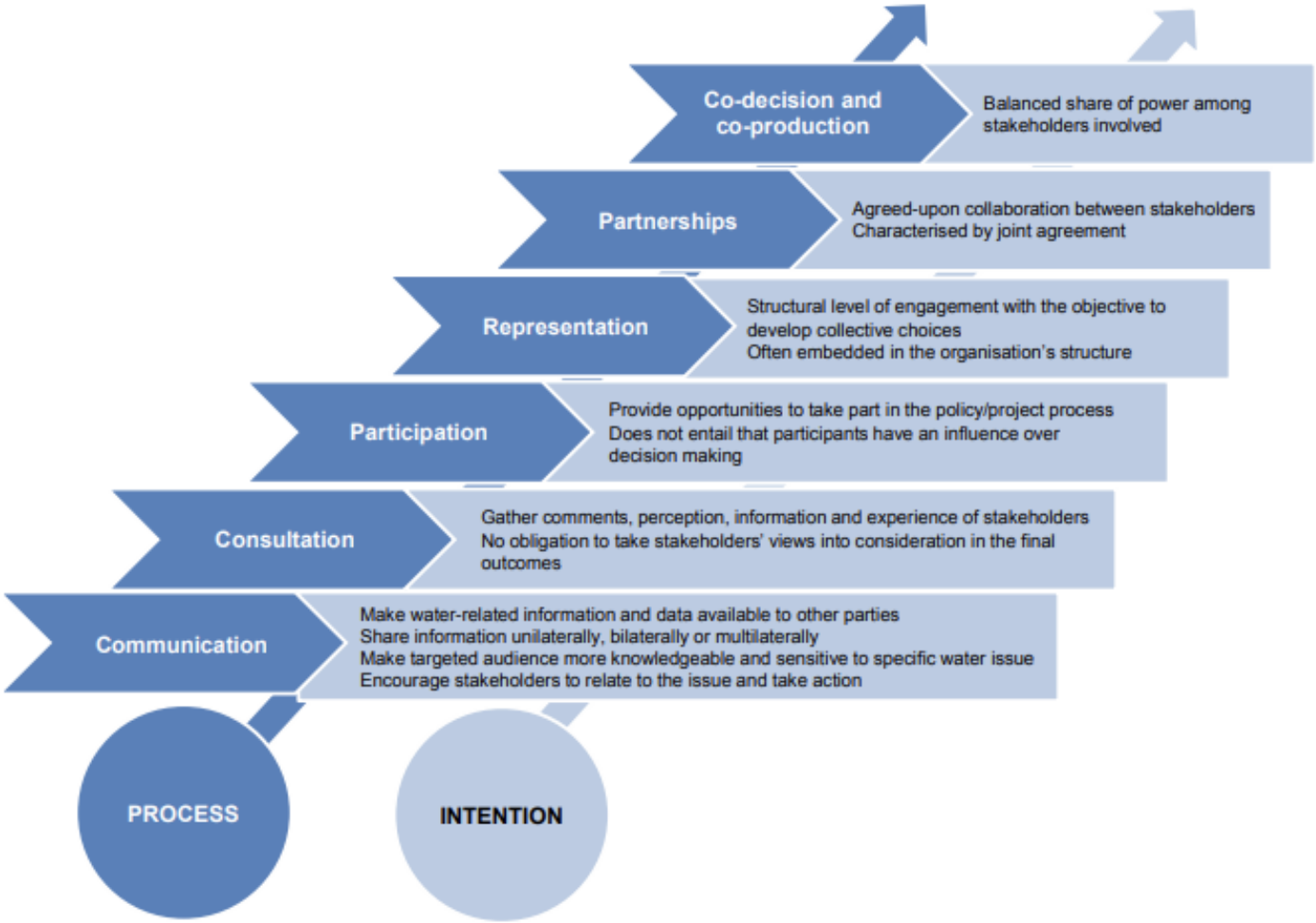

Figure 3Level of Stakeholder Engagement
(OECD, 2015)

Chapter 3

Methodology

3.1. Study Area

Figure 4 Map of the Research Area
(Wachpanich & Third, 2022)

The purpose of this research is to understand the approaches of sustainable development the current water projects are following. It also wants to study the extent of participation for small-scale stakeholders in cooperation towards Food Security, and if such participation is leading to a form of "empowerment" in the decision-making process.

It was considered relevant for the research to focus on the Khong-Loei-Chi-Mun project in Thailand, as it is a renewal of the former and controversial Khong-Chi-Mun development. The research will first extract its information from secondary sources, then will process to interviews with key informants in the fields and local populations to understand the opinions of the project in different power positions.

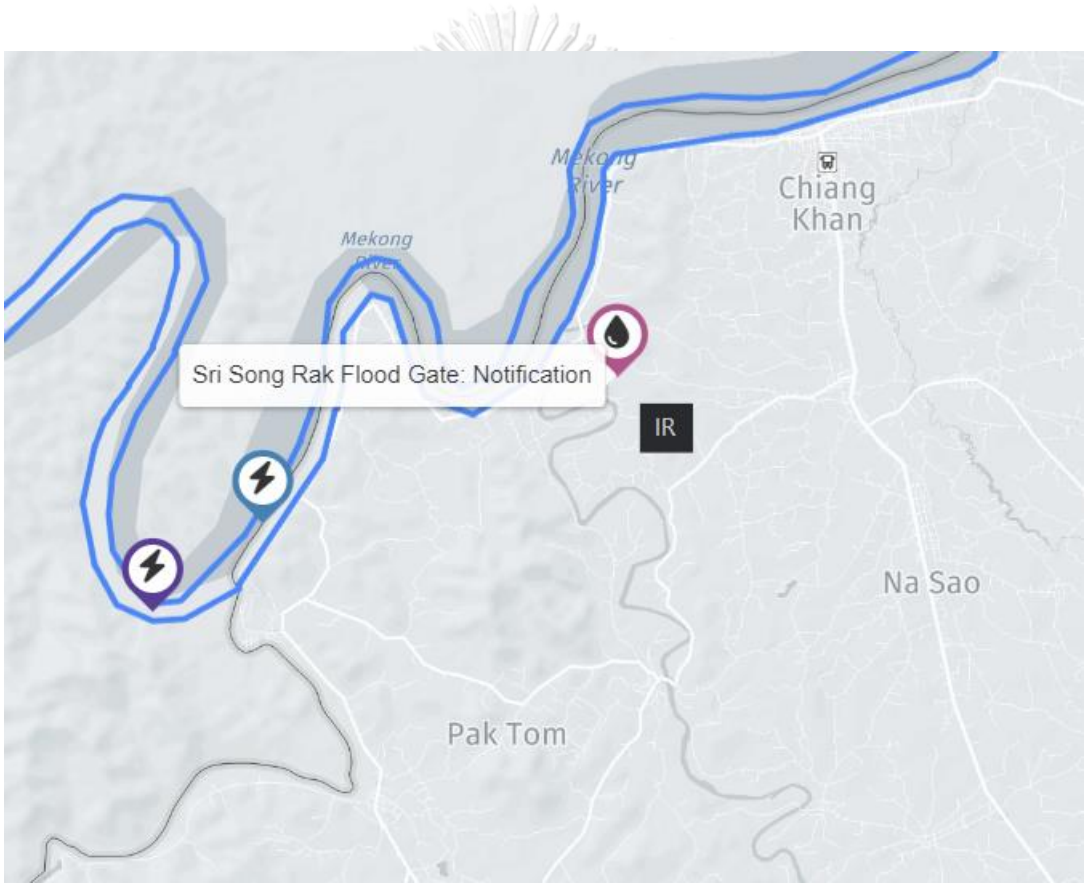

Figure 5 Sri Song Rak Water Gate Localization
(*MRC PNCPA Database*, 2023)

To have and "in depth" understanding of the situation, focus will be put on the study of the Sri Song Rak Water Gate. The study of such case also wants to understand the position neighboring countries can have in the development of water

management, as the water gate is only located 16 km away from Mekong River and Lao border (Figure 4).

During the study, the data collection will be done through primary and secondary sources.

3.1.1. Case Study Justification

The KCM project was first decided and implemented in 1989 and 1992 in the hope of “Greening” the Isan region to improve access to water and irrigation for farmers. The program consisted of a series of 13 dams that would divert Mekong, Chi and Mun Rivers flows to store and discharge water depending on requirements in the season (Kerry Lee, 2005). Due to insufficiency in environmental and social integration in the framework, the project was considered as “unsuccessful” but wasn’t abandoned. New talk about reviving it came back since 2012 with a Feasibility Report made for it in 2015. The renewal of the KCM was called KLCM with the add-up of the Loei River in the diversion and irrigation plan. However, numerous calls from governments, organization and locals asked for the decisions that are based on previous faults of the project to avoid the same mistakes and build a sustainable irrigation system in the region (Apinya, 2016).

The KLCM is located inside Thai borders but can be scaled on the transboundary level in terms of environmental and social impact, the Rasi Salai deforestation being an example of it (Sneddon, 2003). Vietnam and Cambodia criticized the project for the decrease in water flow it could lead to downstream to the Mekong River, affecting local agriculture and fisheries. Their threat to veto the project under the 1975’s Joint Declaration of Principles for Utilization of the Water of the

Lower Mekong Basin lead up to the creation of the MRC in 1995 that took out the right to veto from every member country (Kerry Lee, 2005). The study of such a case on the transboundary and international cooperation is relevant to understand the involvement of international organizations and NGOs, and the influence they have over it.

3.1.2. The Definition of "Small-scale" Stakeholder

When defining who is a project "stakeholders," Freeman gave the definition of "*any group or individual who can affect or is affected by the achievement of the objectives*" (Freeman, 1984). Based on this study, different methods of stakeholders' classification emerged, like the "prioritization" ranking. With multiple stakeholders over a project, conflict of interest can arise, prioritizing can avoid such conflict (Hall et al., 2015) so the question needed to be asked is "what really counts." Powerful stakeholders of public or private sectors are the first to be prioritized as no organizations or firms can "afford to consistently ignore their interests." Classifying stakeholders by the power they have over influencing decision-making is a first method. Then, going back to Freeman first definition, "primary" and "secondary" stakeholders are classified following their level of concern and impact over a project (Clarkson, 1995). In the case of this study, the term "small-scale" will follow the definition related to power and influence: small-scale farmers, members of local community leadership, regional government representatives, NGOs, private sector (Muhoyi & Mbonigaba, 2022). Furthering the research in these groups of stakeholders can later define their position of the "prioritization" scale whether they have a power of influence over development or not.

3.2. Data Collection

The secondary data was collected by reviewing government and organization reports to overview the discourses used in policy development and cooperation. Then, to have relevant results from interviews with local and farmers' representatives, the first data collection included local knowledge and point of view.

Office of the Research Ethics Review Committee for Research Involving Human Subjects – Number of Approval: No. 415/66.

To understand dynamics and changes in a specific project, primary data collection is regarded as a relevant method to review motivations and variables (Lyons et al., 2001; Somruedee, 2017) in cooperation, participation and empowerment assessment. It was done by using open semi-structured interviews (Appendix) with key informants and actors of the water management and rice agriculture sectors. Semi-structured interviews were chosen for their capacities to deeply explore the research topic, and its efficiency in viewpoint exploration thanks to it being an openly designed format (Flick, 2002; Ruslin et al., 2022). It also gives the possibilities to uncover new variables depending on the orientation taken by each interviewees (Offerdal, 2019). Finally, in participation studies, the understanding of experience is the most relevant methods in data gathering, and to ensure relevant information, subjects should use their own words and not academic-based description. The most efficient way to do so is to process by interview (Oels, 2003).

3.2.1. Key Informants

The sample method used for interviews selection was to focus on "key informants" interviews. First, the water management and agricultural development

fields are large and interconnected field of expertise, involving too wide a category of people to be able to complete the research in the allocated time. Second, the Northeast Region water development and KLCM project are of high-importance to the government, a position that can limit access to information over the project. Key informants have a "*sponsorship*" advantage (Valerie & Robert, 1992) that can provide data unavailable to the public.

The key informants were selected following Marc-Adélard Tremblay (Marc-Adelard, 1957) methods that consist into selecting the "ideal informant" by the use of selection criteria related to the data requirement. For this research the criteria were

- Involvement with the case study
- Knowledge
- Communicability
- Willingness of participation

Marc-Adélard Tremblay also encourages the use of "Impartiality" criteria to avoid bias information. However, it was decided to not include it into this research to understand the different visions over the project and their motivations. They can be subject to bias.

Following the definition of the criteria, key informants were separated by fields of activity:

- International actors in Cooperation and Water Management and NGOs:
    - Academicians
    - Researchers
    - Project managers

- Government Offices in Irrigation, Water resources and Agriculture:
    - Finance division
    - Secretary
    - Ex-secretary
- Farmers and Cooperatives of agriculture activity:
    - Farmers,
    - Group leaders
    - Local journalist

This research compiled a total of 12 interviews with a balanced number of 4 representatives for each field of key informants. The interviews are divided into two parts, first they were questioned on the need of the region, the relevancy of the KCM and KLCM projects. In the second part, the questions focused on their participation and action to gain visibility and empowerment. This section relied on the OECD chart "Level of Stakeholder" for interviewees to locate the position stakeholders are holding in a precise way.

3.3. Data Analysis

The qualitative data collected during the interviews followed by a thematic analysis method. Key themes were classified into a table and subdivided to extract convergence and similarities over the same topic. Each table was sorted out by fields of activity as each of them give importance on different topics of discussion.

A content analysis methodology was applied in the assessment of government and international cooperation reports and academic papers related to the

topic. The secondary data was compared with the information gathered from interviews to see if some ideas and themes are coming back or diverging.

Assessing Food Security in a region is a complex and disputed task, the criteria for selection can be subject to partiality depending on the approach taken in research. It can explain the development of numerous indicators of Food Security without having one outstanding with the others. For this research it was decided to follow (Fabio Gaetano, 2015) works, that relied on the use of composite indicators to assess Food Security . These indicators have the advantage of outlining multidimensional issues and focusing on country performance.

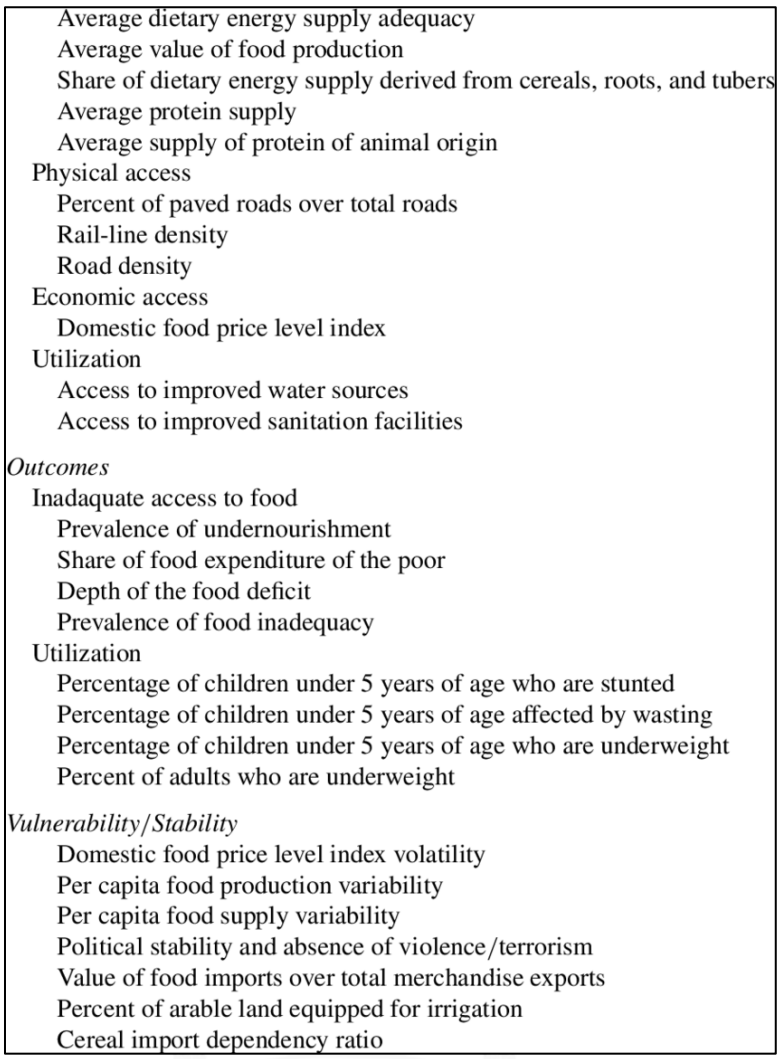

Figure 6 Food Security Indicators
(Fabio Gaetano, 2015)

The goal of this paper is to understand if the promotion of rice production with the irrigation provided by KLCM projects can answer an enhanced Food Security. Not all indicators provided in the previous figure were kept, the only relevant one based on the criteria of:

- *Related to agricultural production.*
- *Economic access*

- *Resources consumption*
- *Nutritional value*

Chapter 4

Results and Discussions

4.1. Irrigation project and Water Management in KLCM

4.1.1. Motivations for Water Development in the KLCM region

The literature review has proven that the motivation surroundings the development of large-scale water management project in the Northeast Region was due to the will to answer to "Green Essan". Accordingly, during the interviews, questions were asked on the relevancy of such a statement and about the idea key informants have over the need for water and irrigation in the region.

"*The Essan region and the KLCM project are of High Importance to the RID, classifying it as Highest Priority project. This position is allocating them more budget, but it is also complexifying the whole managing process as it involves more offices and departments.*"

This idea of water access and the development of new projects being of relevant influence to regional development was shared by a government representative, and agreed upon by another interviewee of the same background:

"Water access is important, but the limitation of water waste and the loss of money over it are what matters in the countryside. By implementing and regulating irrigation systems in the region, it is possible to increase the efficient use of water resources. As a result, it can increase the rice yields per rice without increasing the cost of production input."

From this statement, it could be understood that the irrigation development under the KLCM can lead to an increased access to water, but also to other forms of

development, like the reducing of production cost and the increase in productivity of rice grains. The idea that water management and irrigation project under the KLCM can lead to new development was shared by other interviewees of different backgrounds.

"We cannot be biased when looking at such a large project of development, it is coming with environmental issues, but we should also look at the development they bring to the region, like the construction of roads and the creation of employment related to water management."

"At the beginning of the project, we were mostly looking at the new access to electricity it could bring."

Economic advantages were the first point of importance prior to the realization of the environmental impact of large-scale projects like KCM and KLCM can have. This one-sided interest is not specific to authorities' ambitions, it is also displayed by local populations and farmers. However, The "Greening of Essan" project under which the KCM and KLCM were developed has been criticized for the focus on economic and technical development over the integration of environmental and social context in the planning (Molle et al., 2009). This idea was shared by the different key informant, their is a difference between what was being said and what was applied under the new KLCM project, as most of the motivation remains on the economic and technological development. This position could be explained by the complexity for a central government to integrate environmental perspective and local context in national plans, the Royal Irrigation Department being the decision maker and budget provider over the KLCM. (International Water Management et al., 2007)

previously argued that the acknowledgement of small-scale institutions in water management had better reach over the local population and better integration of environmental issues.

The concept of water waste was cited by 2 interviewees, but it is still an insufficient number to have an entire application of water saving performance and limitation of waste in irrigation systems. Such low number can be explained by the limited understanding of what "waster waste'" in agriculture is. A lack of knowledge that concerned all actors, government officials as well as farmers. To encourage efficiency in water development and irrigation systems, when developing these later, the focus should not be on water quantity itself, but on the water value per crop yields[2].

4.1.2. Water Demands Between KCM and KLCM

At the catchment between the Loei and Mekong River, the annual catchment of water it of about 3,964 square kilometers[3]. From this total amount, it needs to reduce the quantity of water that will be used by the Sri Song Rak water gate to irrigate about 61,297 rai. Furthermore, the canal constructed under the KLCM project will be leveled in a slope to deviate water from the Loei River to fall into the canal and not the Mekong River (Panya, 2020). With these results, the Northeast region is not as short of water as it is advertised by governments and projects actors. Under the project, the consumption per person is lower than the quantity of water, it can be concluded that the issue relies on the accessibility and storage of water for consumption and not the

[2] Crop yields are the kg of rice produce per rai. The higher the production of one rai, the high crop yields are.
[3] This number includes rainwater catchment in the river. The result is from the 2005/2548 year.

resources quantity themselves. At international level, the role of the Sri Song Rak gate and the KLCM canals can be impactful on downstream tributaries of the Mekong River.

	KCM (1987)	**KLCM (2020)**
Total area allocated to agriculture in the region (rai)	105 million	63.85 million
Targeted area of irrigation in the project (rai)	1.98 million	1.69 million
Water Diversion (in cubic meters per year)	2,252 million	1,916 million
Quantity of allocated water per rai (in cubic meters per year)	1,135	1,113

Table 3 Water Diversion and Irrigation expansion under KCM and KLCM projects (National Energy, 1987; Panya, 2020)

Even though the new KLCM includes one more River in its development, the targeted areas of improvement are inferior to the previous plan (Table 3), with 1.69 million rai targeted compared to 1.98 million under the KCM project. Such this difference can first be explained by the changes of activities in the region, with urban rise and communities turning towards industrial and service work sector, reducing the quantity of lands allocated to agriculture production.

In terms of area of action, the number in Table 3 showed that the KLCM was a smaller project than KCM, with fewer targeted lands and quantity of water diversions. However, the total allocated water per rai under the irrigation system remained approximately the same between the two plans. So, the same quantity of water would be used in rice production and other agriculture, a situation that is not favorable to Sustainable Development and the preservation of natural resources.

Based on this result, it was assumed that the productivity of water usage is still not integrated into the irrigation development framework, this later still relying on a heavy consumption of water for rice production. An important conflict was observed in understanding rice “production” and rice “productivity.” This latter word was used multiples times in interviews with different representatives, that were advocating for the focus over rice and water “productivity.” However, in terms of application of such promotion, the reports and numbers are proving that “productivity” is still not integrated into the framework. It can be assumed that the term “productivity” is used as a “buzzword” to support the project. This example converges with (Cornwall & Brock, 2005) speculation over the use of “buzzwords” in sustainable development discourse without their execution.

Based on the size of each project and their targeted area, the comparison concluded that expected results from the KLCM are quite similar than under the KCM as the yearly use of water per rai remains to a close level. In front of the discourse “learning from the KCM dysfunctions” to build up the KLCM project and integrate environmental aspect in it, the consumption of resources and deviation of rivers water flow are not in practice following this ideology. It is understood that the increase of agricultural production still relies on agricultural expansion but not resource productivity.

4.1.3 Food Security and Rice Production in KLCM Region

The issues and opinions related to increase food security with the development of irrigation are diverging. When farmers are asked about their situation in terms of food production and access, most of them explained that their personal

level of food security decreased since water projects under the KCM, and they were afraid of the same situation with KLCM.

"We didn't have issues with rice and fishes before the dams. But after they came, lands were covered, fishes disappeared, and the compensation was not a relief to everything lost."

This idea followed another interview from an organization that explained:

"When people are relocated, lands provided are not guaranteed to provide to their need in agricultural production, either because the landscape is not suitable for agriculture, or the soil qualities are low. This lead most of the relocated farmers to change their activity from the first sector to the third sector, in which they provided cleaning services and even prostitution.

The allocation of non-suitable lands limited the agricultural potential and production, it did not ensure that these lands had an easy access to water as well. All these elements can impact of the capacity of each farming families to produce enough food for their own demands, even less for the market ones. Furthermore, the change from first to third sector can lead to move from a rural to urban environment. The average cost of life in cities are higher than in the countryside, exposing families to higher food insecurity due to a lack of funding that limits the access to food, and increase the reliance on non-nutritious meals that are more affordable.

Government officials' interviewees recognized the issues around the allocation of compensation to impacted farmers.

"Relocation is difficult, and expropriation of land may not end easily and in good terms."

However, it is important to differentiate between two types of farmers in front of the KCM and KLCM projects:

- Farmers impacted by irrigation projects, most of the time they are on the "upper" side of dams and other construction. These lands are the ones that will be exposed to inundation and change of environment.
- Farmers that are beneficiaries of the irrigation plans. They mainly are located on the "lower" side.

The second category of farmers wasn't represented in the interviews done for this research, restricting the access to their point of view and position experience in front of irrigation development and agricultural production in the KLCM region. Their related information was provided by interviewees that had contact with this group of farmers. The first point that was given is that they are the one having a direct access and benefits from irrigation.

Under the KCM project, to access to irrigation farmers had to submit a request by groups of 8 to 10 representatives, with a cost of 75 baht per hour for pumping energy, and all requests could not be approved during the dry season (Airawan Anithorn et al., 2003). Access to irrigation systems does not guarantee improvement in productivity if water use is not regulated, the overuse of water resources can increase the cost of production and reduce benefice per rai made. In the last years, the price of energy became unstable due to international crisis like Covid-19 and conflicts (Figure 7), with a decrease of approximately 30 points on the

Consumer Price Index. Relying on an unstable system can place farmers in a vulnerable position for their economic development as their activity can be impacted by the energy prices. Furthermore, “Rice” is the second resources of the most fluctuating in the region, with an increase of 20 points during the identical period as the one observed for energy. The input and output in rice production are both economically fragile and, as a result, cannot ensure a sustainable development of Food Security in the region.

This cost-benefice gap explained the loss of interest from farmers to focus on dry-season crop production.

‘People are trying to focus on other crops during the dry season, to limits their input of water and increase their incomes. They will grow vegetables instead or raise cows or poultry. They try to work with their region to adapt themselves to environmental resources access and to answers to their economic need at the same time.”

Rice is a water-intensive crops with about a need for 1000 cubic/Liters per rai in dry season production. It is a crop suitable for wet season, but not for the dry season, and as an interviewee explained:

“In the Northeast, our wet and dry season are both intense, making it suitable for rice farming during the wet one, but not second crop systems during the dry season. That’s why they want to develop so many irrigation systems in the region, to focus on dry season production.”

The two maps show the lack of suitability of the rice crops in the Northeast region, with only a few areas (colored in green for the two maps) that would be apt to

such agricultural activity (Figure 8&9). The promotion of dry-season rice is not sustainable in the region, due to the intense needs in water inputs and the low-suitability of local soil compared to the Chao Praya Basin in Center Thailand. Furthermore, new technique of cultivation is being promoted, like the "Alternative Wetting and Drying" system that can reduce up to 25% of the consumption of water per rice crop rai, and increase the yields per rai of up to 80 kg (Suneeporn et al., 2023; Unep, 2017). Because the Feasibility Reports showed that more than 1000 cubic meter of water per rai will yearly be allocated with the irrigation systems, it is clear that no plans of reduction of natural resources inputs in rice farming were included in the development of the region agricultural activity.

The concept of Food Security relies on four principles: Availability, Access, Utilization and Stability (FAO, 2006). By basing the result on the Food Security Indicator selected in (Fabio Gaetano, 2015)'s work, it can be considered that the overall water diversion done by the KLCM, combined with the water demands in rice production are not guaranteed to answer "Stability" principles.

- "Access to improved water sources," is answered, as the KLCM targeted 2.64% of the arable to develop irrigation.
- "Percent in arable land equipped for irrigation" is still 2.64% under the KLCM project.

Even if the project answered the development of water access infrastructure, it did not provide any information on an expanded access to the irrigation system further the 2.64% targeted area. On a long-term, interviewees were clear that large-scale project faces difficulties in reaching farmers in non-targeted areas, a situation

that can be answered by focusing on medium and small-scale projects instead. Therefore, the KLCM project answered current needs in Food Security enhancing, but does not ensure a long-term, suitable and sustainable expansion of irrigation access. This is also one of the limits of using Fabio Gaetano Santeramo's indicator, they did not integrate the long-term vision over development of Food Security.

- "Domestic Food price-level index," it was observed that rice domestic price has been fluctuating over the last years. Moreover, the energy price as well, not ensuring an economic access and stability in Food Security.
- "Average Dietary Energy Supply Adequacy." Rice itself is not enough in terms of nutritional value. However, farmers and experts explained that their fishery activities were impacted by dams and irrigation construction in the region, reducing their access to other sources of nutrients. Furthermore, the promotion of rice and second-crop production is not sustainable, but the turn towards alternative crops and food activities is still difficult.

The important promotion of rice farming was mainly done by older generation farmers and government as they are both following conservatives' idea over the cultivation of rice. These two groups were diverging with a new generation that was promoting alternative activities in front of dry-season rice farming, a technique considered not suitable for the Northeast Thailand weather context and environment. It can be assumed that rice is a social and cultural crop, due to its importance in tradition and household farming, leading to bias over its promotion,

when it was proven that the KLCM region is not the most relevant area of rice farming.

"Megaprojects" like the KCM and KLCM have been criticized for their unsuitability in integrating a region's environmental and economic context, leading to an unfitted development and management (Kerry Lee, 2005; Paritta, 2016; Sneddon, 2003). Through the production of rice, the KLCM has been proven to be only able to provide a better access to irrigation and water resources, but even this position is not guaranteed to be a long-term one, and target only a small portion of the farming population. Finally, most of the promotion of the rice production and second crop under the project irrigation was not answering Food Security indicators. However, this study was only done on rice and should not be generalized to the entirety of the region, if all sources of nutrients were added to the indicators and variables, results would be different.

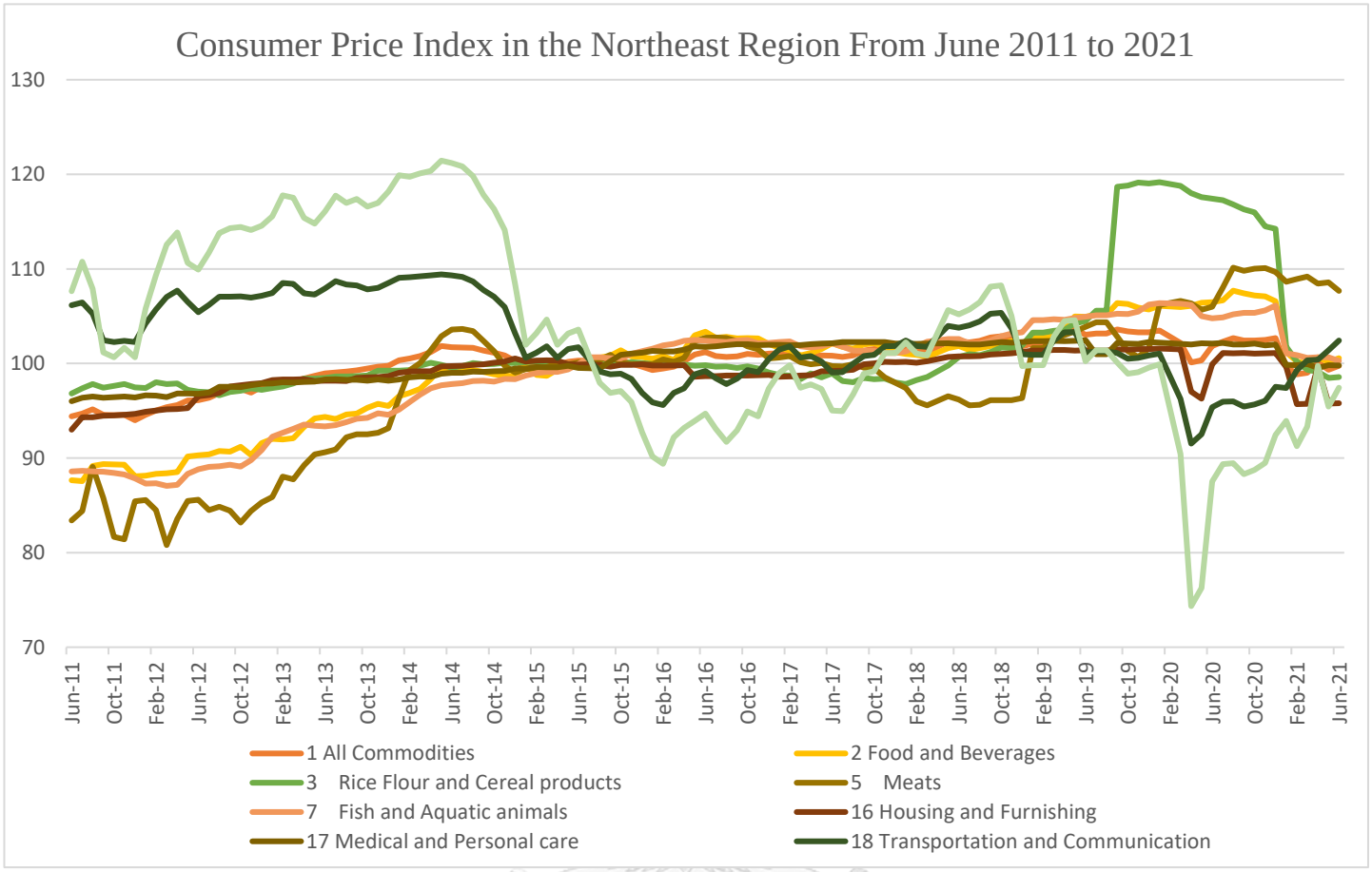

Figure 7 Consumer Price Index in the Northeast Region from June 2011 to 2021

(Public & Real Sector Data Management, 2023)

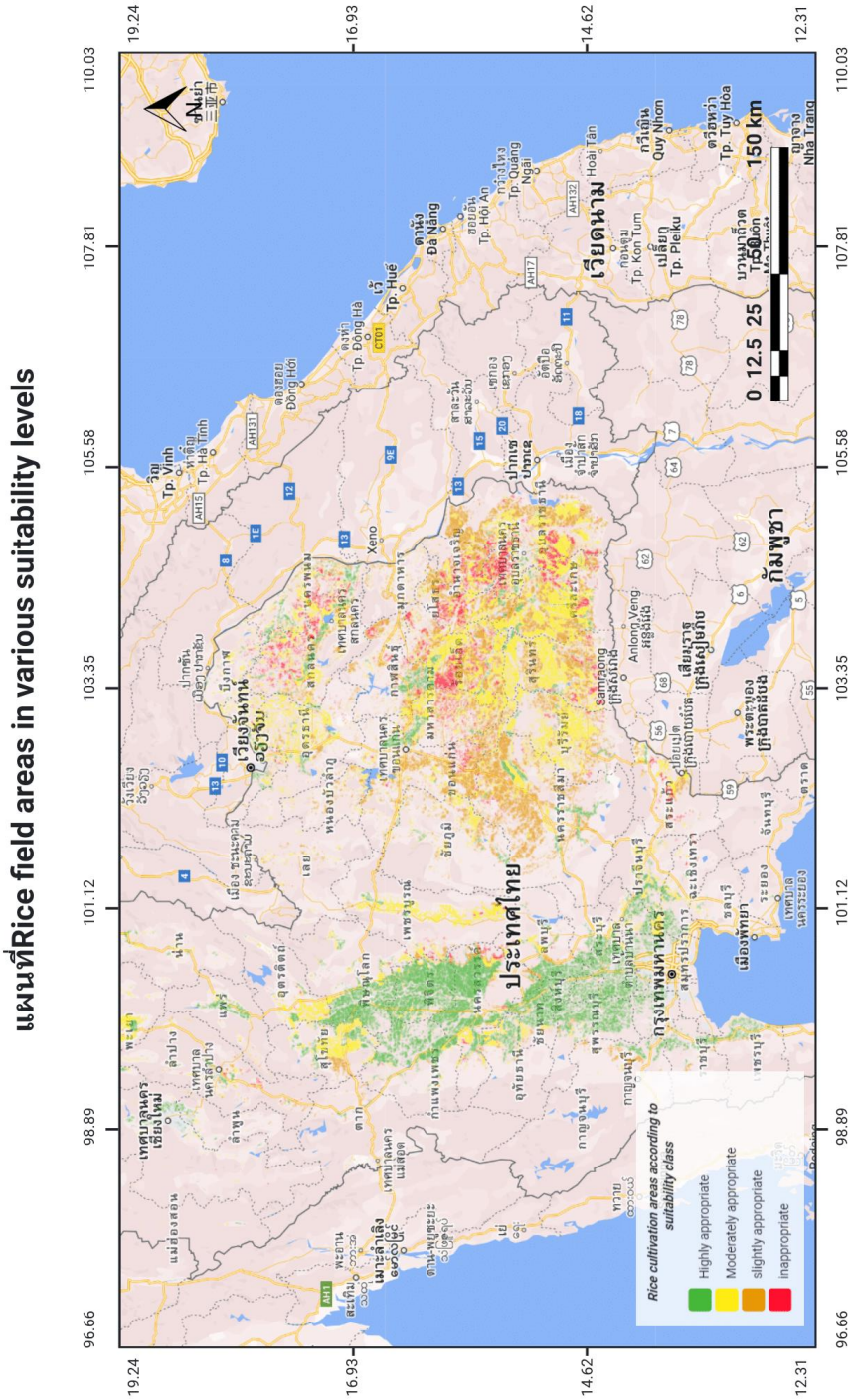

Figure 8 Suitability rank of rice cultivation in Thailand, 2022 (Thailand Ministry of & Cooperatives, 2023)

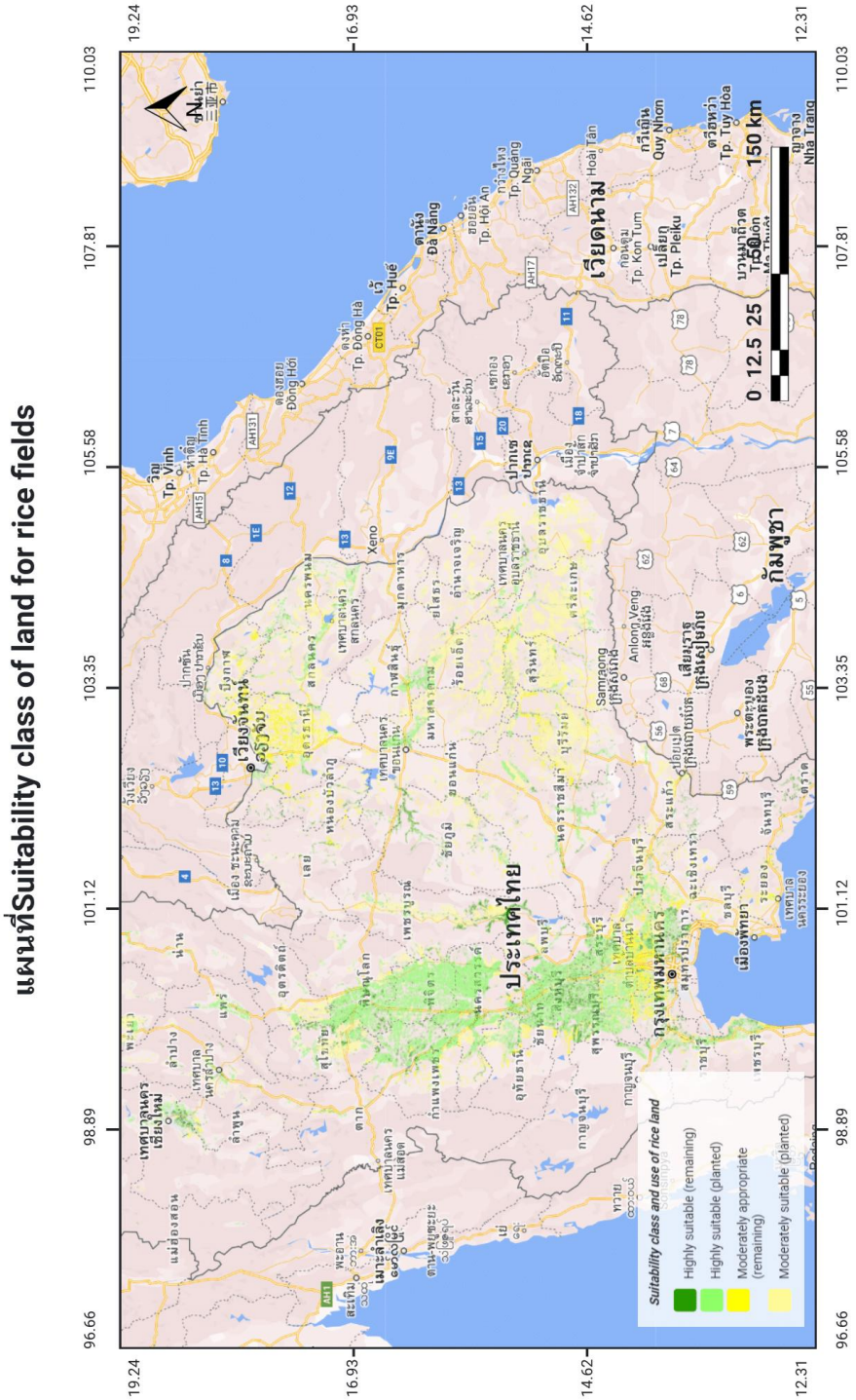

Figure 9 Rice fields suitability class of land in Thailand 2022 (Thailand Ministry of & Cooperatives, 2023)

4.2 Small-stakeholder roles in Water Management related to rice farming.

4.2.1 Farmer's activity in front of Water management

When questioned about their position and scope of activity, they were having in agriculture and water management in the region, farmers' answers all varied.

"We are pushing for the 'Revival Plan'[4] *to have access to usable lands. The plan is to give lands, natural resources, an eco-social and market integration to all relocated farmers after the construction of the dams."*

"What we are trying to do now is to bring people from the urban context and the capital to our region so they can realize our reality with the water construction. The visibility we can gain would give power to defend our rights and positions."

Most of these roles cited by farmers are "active" to the project. They were developed due to this population of farmers being impacted by the dams' projects under the KCM and KLCM plans. However, "proactive citizenry" is one of the elements necessary to promote local community roles (Ahmad Muhammed & Abu Talib Noraini, 2015) , however "pro-activity" relies on building capacity in prevention, and as observed, farmers and local populations in the KLCM region rely on rejection of any dams or irrigation project as a method of prevention. This biased opinion about water project blocks local development and empowerment.

Out of the majority, one argument claimed that farmers are losing will to work on large-scale water management:

[4] The original Thai name is แผน ฟื้นฟู, translated into English for this research.

"Farmers are tired to works with large and complicated projects, so they now focus on creating their own, localized system, at their own scale. It simplifies the process and answer to their need in agriculture and livelihoods as it is more suitable and physically closer to farms and villages."

Overall, in water management, farmers did not have a proactive position, they acted following the government projects, either to go against it or to develop new plans that are more suitable to themselves. Two hypothesis can be extracted out of this information: first, a lack of involvement and interest from farmers towards irrigation projects, leading to them not having an important knowledge on changes that such projects would bring. Second, a lack of transparency coming from the government and authorities in charge of the projects, which limited access to relevant information and concerns. This second situation was already pointed out in the KCM assessment work (Paritta, 2016), whereas, the first statement was debatable and still argued under the KLCM project.

The knowledge sharing and decision-making position to farmers over water management was another position described during the interviews.

"It was a three-day workshop in three different provinces that were related to the project. Organizations and CSO were invited to talk and discuss about the need for the region and the feasibility of the project. However, when you talk to the participants, not all of them are here for the purpose of defending their position. Some were invited by organizers simply to be there and look good on the picture. Most of the time, these compensated groups are composed of women that will wear traditional clothing simply to give a better image to the organizing committee."

This remark implied two ideas: the first one was that not all farming organizations and corporations want to be that important in the decision-making and management of water-related projects. Second, authorities were relying on the "power of the number" to justify their position and an image of participation with farmers. In her study (Ozden, 2023) draws a line between "participants" and "participation," as the first one does not guarantee the second, on the contrary, it "overshadows" it. In the KLCM situation, the "quantity over quality" method wasn't only used by authorities, but also by farmers that relied on it to gain visibility and power to defend their position. In front of the KCM project, the rallying of 13 villages that totally compiled 2000 villagers in front of authorities were what lead to the possibility of negotiations.

4.2.2 Communication between Stakeholders and Government

Multiple variables influenced the farmer's cooperation with the government (Hirokawa, 2010):

- Their knowledge over new agricultural methods
- Their family opinion and influence
- Their trust in the administration

Farmers' representatives and local organizations were asked how cooperation can be improved between the different actors, the concepts of "top-down" approach and "hierarchy" surrounding the government system came back. The authorities were described as "conservative," leading impossibilities to change them and their process of management and communication.

Government officials that answered over the topic gave two categories of answers:

"*The way the RID implementation of projects works its projects are explained and proposed to local populations by government representatives in the region. If local population disagrees with the project, it is canceled. If they agree, we continue with a signed agreement. But, in reality, if disagreement and resistance are expressed, RID will interfere with it and still develop the irrigation work."*

"Farmers don't understand the in-depth situation in their area and don't accept information from central officials. It is needed to first transfer the irrigation knowledge to regional offices that will then talk to farmers."

For most of the answers, the farmer's roles in irrigation development were recognized, but the scope of activity was diverging. The first example mentioned that the power of agreement over the project is given to farmers even if the final decision will be interfered if it is not following the RID objectives. On the other side, the second examples didn't give any roles to the farmers except as receivers of information. A general lack of theoretical knowledge over the KLCM project made the local farmers voice non-recognized by authorities. This situation is explained by the old age of farmers and their head representatives that don't lead them to open to new technologies and communication with regional and national authorities. However, most of these opinions were shared by central government-based officials, that are coming form the capital region. They might have a smaller understanding of local farmers' knowledge and suitability of it and be biased over their relevancy in participation. Capital officials still remains relevant interview to understand the centralized authority systems, but their knowledge of regional and local issues is disputable.

Only one interviewee outside of the government category criticized the farmer's actions in water management and irrigation development:

"You have an important bias from farmers against dams in general, and they automatically go against a new project, indifferent to the benefices."

From the farmers and local organizations interviews, an important opinion condemned that large governmental project cannot be adaptable to "case-by-case" environmental and economic context due to their size and the national policies they are following. But on the contrary, when looking at the division of governmental offices like the RID, each project has a subdivision that was more localized, less central. However, government officials interviewed recognized that the concept of "mega" around the Khong-Loei-Chi-Mun project was making it more difficult in management of offices related to it, budget distribution and knowledge communication.

"*Under a "mega-project" you must cooperate with many: many rivers, many info, many parties, and many officers."*

The collaboration with authorities was a diverging topic between farmer's organizations and representatives. Some groups were willing to collaborate with the government to reach a better management of irrigation and agriculture, like the "Network of Thai People in the seven Mekong Provinces in the Northeast regions (สมาคมเครือข่ายสภาองค์กรชุมชนลุ่มน้ำโขง7จังหวัดภาคอีสาน)" whereas some did not agree with it, like "Chiang Rong" Civil Society Organization (CSO) located in Northern region of Thailand. Collaboration with government is still difficult due to the

important numbers of departments and offices that have authority and management over water resources and agriculture development. One CSO representative interviewed explained:

"Sometimes, we must contact up to 8 different ministries, and each has different guidelines over conformity of representation. If a group or association is considered non-conform to the office requirement, the committee will be canceled."

This statement shows that communication and cooperation with authorities were proven to be difficult to access, requiring adaptation capacities from farmers' association to answer each administrative requirement. It can be assumed that these challenges in communication are obstacles in giving a role to farmers and local organizations in KLCM management. Developing a clear and convergent system of communication would be necessary to enhance their position in decision-making and management.

In conclusion, political opinions and ideologies of CSO were of important influence over the cooperation between farmers and government. At the same time, the tools, and capacities available to farmers to develop cooperation with the government offices were difficult to gather and match to different requirements.

4.3 Level of Participation of Local Farmers in Water Management projects

4.3.1 OECD Level of Stakeholder engagement

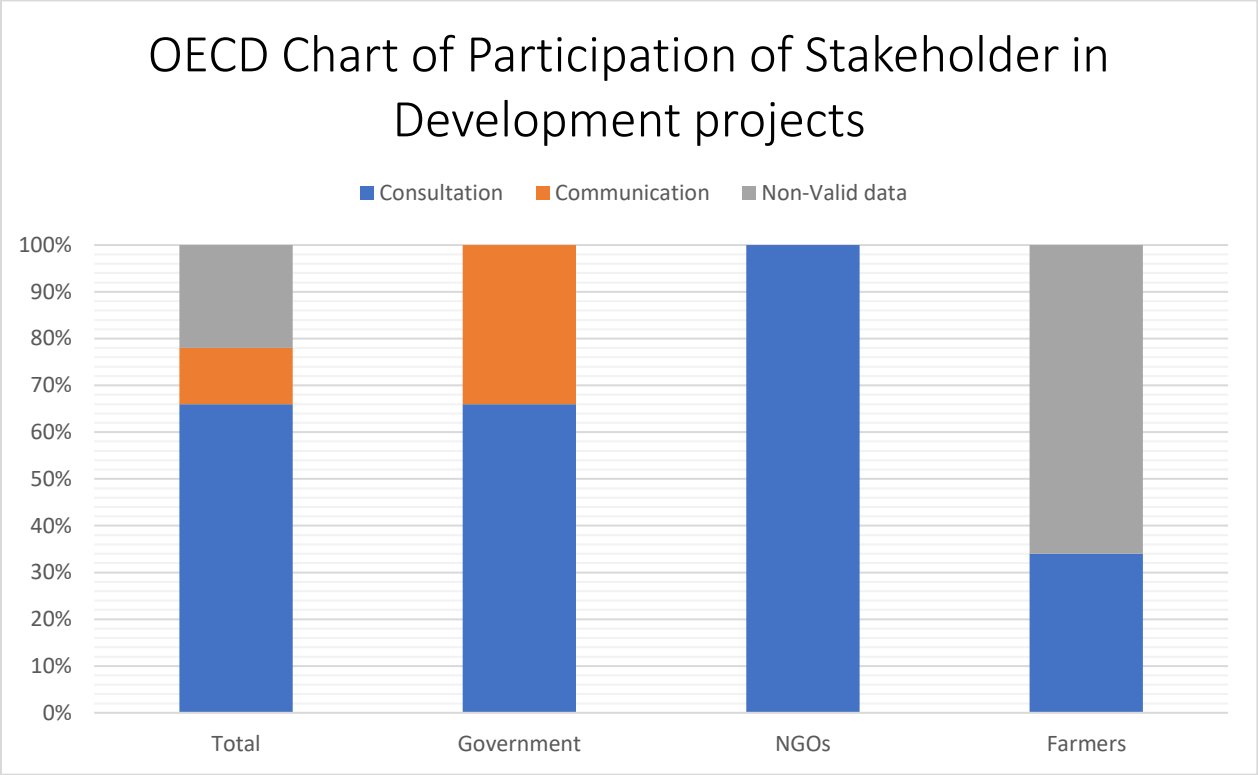

Figure 10 OECD Participation framework results

Based on the OECD Participation framework[5], interviewees were asked to select one level of participation based on their experience and impression. Out of this survey, only two elements out of the sixth described in the OECD framework (Figure 10) were cited by interviewees: (1) Communication with about 10% of the answers; (2) Consultation with more than 60% of the answers. These two were at the lowest level of participation implication, that consist of farmers listening to the information provided by the authorities and sharing it, without decision power over it. It showed

[5] For more information, see chapter 2, section 2.4.

that the level of participation of farmers in rice irrigation development project was low and limited. However, this table did not provide information on the reasoning that leads to these choices and should not be used to draw a conclusion on the actor's responsibilities in management. Answers from farmers impacted by the first dam's constructions under the Khong-Chi-Mun megaproject (about 20% of the answers) could not be considered "valid" for this graph as they were not allowed to express their opinions over the project and were not provided any forms of information on them due to the political context at that time (the 1990s or 2533-2542). Authorities were described as authoritarian and repressive in case of protest.

After answering, interviewees were asked about the reasons for the "Communication" choice:

"You have a difference between what is being said over participation, and what is being done."

"Farmers don't have the knowledge over dams and irrigation, and even if they have it they will go against it, because they want changes without actually changing. If you look at the pesticide and fertilizer example you will see the same, they still use them"

Governments were the only representative to choose the "Communication" element, the lowest one on the chart, showing that officials see local participation not as involved as NGOs and other associations. These choices are explained either by an over-value of the importance of farmers from NGOs, or by the lack of understanding of "on-site" work with farmers from Bangkok-based officials.

"A few years ago, the RID developed the 'River Basin Committee' in the Northeast Region to promote and display their participation discourse, but when you look at the composition of the members, 90% of them are Government Officials."

Central authorities in Thailand still have difficulties in opening to the possibilities of increasing the participation level for local actors and use an image of "participation" to limit protest over the topic and legitimate their water management projects in the region.

Overall, the majority of the answers located themselves on the second level of the framework, showing that most of the key informants interviewed see a slight form of participation in the KLCM management. However, the question that now needs to be asked is whether this level can change and increase or remain in the same position.

In participation study, it was proven that the smaller the scale of a project is, the higher are the potential of participation of local communities in its development, management and maintenance (International Water Management et al., 2007). In this research, it was seen that the large-scale of the project will have an impact on the level of participation of local farmers and cooperative in management of water resources. Participation is encouraged and demonstrated by authorities, but the practice relies more on the number of participants than the "level" of participation itself. In the last decades, Northeast Thailand has seen evolution in farmers and local representation in front of authorities, going from 23% to 77% between 2000 and 2019 (Promkhambut et al., 2023). These numbers contrasted with the remaining low level of participation assessed in the research, and lead to question if the actions covered by organizations

and cooperatives put importance to other issues before participation. It needs to be specified that participation assessment works are still limited. This research worked with the OECD Framework but during the interviews it was realized that the definition of level of participation were unclear, and interviewees had difficulty in identifying in which position they could categorize their level of participation. One of the main reasons is explained by their work being located in a larger scope of participation, as some were more into the "Communication" part and other activities were in the "Consultation" scope. The final choice was made by focusing on the majority of comments that were balancing towards one level more than the other. It can be observed that the definition of the umbrella-term "participation" and its different elements is still not clear and defined, leading to a lack of understanding of it. In the case of the KLCM actors, using the OECD framework gave an idea of participation levels in the project, but it did not provide information on the variables that changed the actor's participation access. This observation already had been made by (Eyssen Isaline et al., 2011), where it was concluded that "satisfaction of participation" was the less evaluated aspect when assessing participation works.

Moreover, "participation" is a subjective term, as it was seen in the KLCM project, some local groups stood for participation by gaining full independence in front of authorities, whereas others were trying to reach a collaborative participation, with an equal balance between centralized and local powers. So, relying on general definition and principles over "participation" is still a complex and limited way to understand the local application of it and how each actor feels the role they take in project development and management.

4.3.2 Forms of Participation

The level of participation differs from the place allocated to small stakeholders but also due to the place they want to have in water management decision-making roles. The forms of participation are also diverging and answer to various goals of representation and awareness rise towards the Mekong River and the KLCM project.

"To gain power and visibility, we have no limits, anyone from any background can join our walks, the more the better."

"We leagued with 13 villages that totally compiled 2000 villagers against authorities. It led to the possibility of negotiations."

"Peaceful Demonstration" have been in place for decades now, as numbers are of high importance for farmers' communities and civil organizations, it was and is still an effective way for them to gain visibility and influence. Currently in Bangkok, the "Assembly of the Poor" located in front of the UN-ESCAP building, is using peaceful demonstrations to gain visibility and express their concerns. The location of the camp and size are strategic to attract the attention of national authorities and international actors. Farmers are also encouraging Thai of all backgrounds to walk with them as it will rise up the numbers in the protestations. Protests are a tool to bring countryside challenges to the urban hears, then, with University cooperation, they worked on bringing the public to the locations of irrigation projects and construction to demonstrate their impact on localities to gain visibility.

The goals of developing partnership with universities and knowledge institutions were to increase visibility and power over the recognition of their knowledge. For

example, the Thaivithat Research Unit for Thai Language, Literature and Folklore[7] at Chulalongkorn University put together a form of exchange with local community members that depict the Mekong River and its context in artistic ways. Such projects are giving new perspectives about the region, it's context and development, and can bring an academic exposure to river communities.

On the international level, participation from small stakeholders and farmers' representatives are increasing but insufficient understanding of English language and access to translation services are blocking the exchange of information and the creation of communication between different actors. One of the most recent events related to water management in the LMB was on 5th October, Luang Prabang, Laos: "13th Regional Stakeholders Forum Data Sharing for Transparency and Trust." Numerous interviewees of this research participated, and where the international academicians had not faced difficulties in front of the languages, representatives of regional organizations and farmers' groups expressed their limits to acquire knowledge and participate in such a forum.

4.4 Empowerment of Local Representatives

4.4.1 Participatory Management

The increased participation of local farmers in management and maintenance of sustainable projects for agriculture and irrigation development relied on the empowerment of these communities to develop tools and methods suitable to reach such goals. During Covid-19, one of the interviewees explained that they survey two regions: the region A was where they implemented small-scale irrigation with participation of the local users, and region B wasn't subject to such a plan. The rise of Food Insecurity during the pandemic was subject to 30% in area A of the research,

compared to 50% in area B, proving that empowerment of a region to develop suitable agricultural systems could slowdown food insecurity during the crisis. The participatory tools used for this research were:

- Participatory Mapping (PM) of the region arable lands and water resources. It relied on the farmer's familiarity with the local lands to create a map of them and assess which are suitable for development, whether they are being used or not and how to improve communication between each. It resulted in the realization of numerous overlooked lands that were not registered in the local authority's systems and underused.
- Agricultural Innovation Platforms (AIP) that let the farmers express themselves on their plan of development and motivations to assess the feasibility of them and highlights challenges in the region.

One of the advantages of such data is that it was trusted by local communities and could be understood. Furthermore, empowerment of farmers is not just the creation of data according to local needs but also their application.

"Farmers try to rely on integrated farming. Instead of growing second rice crop during the dry season, they will focus on another source of income's suitable for the season. For example, they will use the fishery, livestock or grow other crops."

This statement shows that local knowledge relies already on the adaptability of production and activity depending on the season. It was proven that sustainable and resilient agriculture need important "location-specific" knowledge (Sumane et al., 2018), a requirement met up by the farmer's knowledge in the KLCM region. It was

also seen in other LMB region that the understanding of local context and environment helped in solving water issues, like the use of mangrove plantations in front of floods vulnerable regions. Farmers in KLCM know which lands are suitable for their activity and how to adapt it to season changes, water management should follow this pattern to improve their productivity on seasonal activities instead of promoting non-adaptable agriculture.

By following local knowledge and using it to solve issues in the region water systems, it gave empowerment to local communities and credibility in front of knowledge institutions and authorities, if the methods applied were successful. Empowerment of farmers and marginalized populations in water management can lead to 'meaningful' participation from these populations (Jethro, 2012) and the development of knowledge is part of what can improve their empowerment. (Singh et al., 2021) stated that the traditional and local knowledge are suitable and can be adaptable to local water management development. The combination of traditional knowledge and new technologies would give better potential for this development.

4.4.2 Legal Recognition

The gain of knowledge and improved communication were ways to ensure empowerment in local communities in front of water irrigation development. But the need for these new gains to be recognized by the authorities was mandatory for it to be useful. It was proven overtime that developed local knowledge could change government point of view, the "Network of Thai People in the seven Mekong Provinces in the Northeast regions" succeeded into proving that the fluctuation in water flow and level in the Mekong River weren't only related to CC, human

activities over the river like dams and water gates were also of important responsibilities over it. However, such change of mindset and understanding took times and needed a powerful back-up in knowledge to be used. It was seen that the local knowledge is not recognized by government and academics due to its lack of regulation over data gathering and analysis.

The use of universities was one of the steps taken to build "Know-How" knowledge with the locals. New teachings were not only related to agriculture and water resources, but legal knowledge also take an important place into the development of local farmers to have an understanding of their rights and administrative system. Cooperation between farmers and other stakeholders was also a way to share and build new knowledge, as well as increase their visibility and power. Finally, NGOs and CSO are also strong partners in multiplying their position and reach the public and authorities.

"*We ask for agricultural tools to develop the allocated lands, but if we have at least 8 out of 10 we will still gain something.*"

Some farmers activisms were based on voluntary work from their community to attend protest, court and defend their position. This kind of method required an important time involvement, impacting on their professional activities. And the results were long to be seen and not guaranteed. After the interviews, it was clear that farmers are in a difficult position to be recognized as valid holders of knowledge due to their bias in water management and their "non-conventional" gain and application of knowledge over the region. A lot of empowerment was relayed to organizations and CSO, that are representative of marginalized communities and farmers, they were also

the most viable methods of communication between local groups and authorities. However, the challenges of working with administration recognition and constant changes in government were slowing down their expansion and improvement in empowering farming populations.

4.4.3 Youth Positions

Youth populations are considered a minority for multiple reasons, like the demographic "slowdown" in rural regions plus the move to urban environment for economic opportunities diminished the representation of youth in agriculture and countryside in general. Second, farmers had the tendency to keep their land even after reaching an old age, so most of the lands were still under elderly ownership, not letting the possibilities to new farmers to get access to them and develop their own production.

During the meetings with key informants, ideas over the youths were converging and diverging. The combination of young people and knowledge production is the most shared opinions between actors. It was seen that farmers have a willingness to learn about new technologies, but it needs to be recognized that their willingness to adapt will be influenced by their level of basic knowledge over these new topics and their trust in government and organization that are bringing this information. One government official recognized their importance:

"By transferring knowledge to younger generations and students, they can bring it back home to their parents and step-by-step change the view over their farming practice and irrigation."

"Younger generations have a different approach over agriculture, it is more related to agro-business knowledge. If they want to stay in the agricultural sector like their parents, instead of producing on a crop-based basis, they will produce on a demand/market-based basis, that will ensure better integration and incomes, and the reduction of debt. Young people are going against the 'as always' mindset that their parents have over the production of rice crops."

Currently, younger generations are seen as the "moderator" between "book knowledge" provided by government and organization, and the practice that will be put by farmers according to it.

"With their new methods of production, they are bringing more money, a system that can give them a lot of power in the next 5 to 10 years."

On the economic level, younger generations had the potential to empower farmers' populations in the Northeast region. A situation that could influence their social and political power to defend farmers' rights and access to natural resources. The important promotion of rice farming is mainly done by older generation farmers and government as they are both following conservatives' idea over the cultivation of rice. These two groups were diverging with a new generation that were promoting alternative activities in front of dry-season rice farming, a technique considered not suitable for the Northeast Thailand weather context and environment. It can be assumed that rice is a social and cultural crop, due to its importance in tradition and household farming, leading to bias over its promotion, when it was proven that the KLCM region is not the most relevant area of rice farming.

Farmers' interviewees also shared views over the position held by younger generations. Thammasat students took an important place in promoting Northeast region dam issues to the public by their participation to protest and spread of words. By the creation of the workshop, they also acted in educating farmers and impacted communities on topics they were not confident in and that could be helpful to build knowledge over irrigation, agriculture and civil rights. Currently, students form Khon Kaen University, Ubon Ratchathani University and Chulalongkorn University also joined the effort.

However, if this "transfer of knowledge" was from the younger generation to parents/farmers it was more difficult to put together than cited. One local organization interviewee argued that the younger generations were under the target of the "Bring them back home movement," which consist of bringing back individuals that moved to the urban region for studies or economic opportunities. Teachers explained that the ideal under this movement is to bring back home young and high potential people that were sent to the city to develop and change their region, but cultural and hierarchical practices were an important block to realizing such a target. Family pressure and management left a small gap to influence new practices, making the whole "knowledge transfer" more challenging than it is presented.

The younger generation was gaining a place into legitimating the local knowledge, as they were educated under university academic principles. However, cultural and social practices are also limiting their potential of development and influence over marginalized populations. Studies argue that focusing on only one scale when talking about empowerment is blocking the true potential of local

empowerment (Grillo & Rew, 1985; Mohan, 2006). Local and non-locals' actors should be related to ensure an influence from local groups towards bureaucrats that will develop appropriate policies. However, the division of legitimacy of knowledge between the different actors studied is restricting the scope to selected actors that cannot guarantee a suitable and integrated knowledge building in the KLCM region.

Chapter 5

Conclusion

5.1 Main Findings

When studying the KLCM projects, due to its large-scale, the inclusion of different backgrounds key informants for data collection was proven to be relevant to understand the different opinions around the irrigation plans and the motivations, experience that lead to such conclusions.

The first part of this research focused on the irrigation projects. It showed that the water diversion under it remained like the initial numbers in the KCM project, not answering the ideal of "water productivity" for sustainable development. The scale of the project was one of the main issues to ensure suitable and long-term development in water access and irrigation-based agriculture and remained limited in environmental and social integration. Focusing on smaller-scale projects would simplify the integration of the three sustainable development pillars in the management plan. On the study and promotion of rice production, it was seen that it did not ensure long-term and sustainable Food Security in the region.

Second, on the management level, locals' organizations and farmers' representation had a low-level of participation over the KLCM decision-making process. And their actions regarding it were more active following authorities' decisions and impacts of construction over the region, not proactive prior to a project. Furthermore, they focused on economic and social fields that were impacted by the KLCM, but not on water management itself. The challenge in communication

between authorities and local groups was highlighted as an element of slowing down a proactive participation. It was explained by the lack of knowledge from local representative and by the complexity of maintaining liaison between each actor.

Finally, the third point figured out ambiguities in the "participation" discourse endorsed by authorities and local representatives. After assessment, the level of participation of small stakeholders in water management was still considered low, speculating that participation was understood as "presence" and quantity of people of different activities in public events. However, "participants" do not guarantee "participation" and efficiency of it. Furthermore, the term "Participation" was still large and difficult to define and put limits on for most of the water management actors. By being subject to too many interpretations, implementing suitable and sustainable participation is difficult in the large-scale KLCM project. In terms of empowerment, "trust and practice," "knowledge development" and "recognition" were the key aspects of empowerment promoted by interviewees during this research. Two types of knowledge were differentiated in the KLCM research and management, academic knowledge and local "know-how." The legitimation of knowledge and its share was disputed: Which should be recognized, by whom and to which extent? If these questions are not answered, having a local farmer's empowerment will be limited.

Overall, during this research it was observed that the KLCM does not answer to a "Water Productivity" ideal, is limited in environmental and social integration and rice's focus does not ensure Food Security for the region. The participation level in the project remained low, and mainly remains in an "active" position, not proactive. A

situation first due to the challenges in communication between authorities and local representatives. Furthermore, participation is paying more attention to the number of participants than their efficiency, it showed that the term “Participation” is lacking definition and subject to numerous interpretations, limiting its implementation. The recognition of local knowledge is an important variable to ensure empowerment of small-scale actors.

5.2 Limitations of the Study

During this research, the choice to work with key informants limited the scope of interviewees possible that are indirectly related to the water management. A total of 12 different key informants were interviewed between October 2023 and November 2023, either on site or online[6]. The first challenge encountered was the time allocated for data collection that restricted key informants that were slow in giving a response. The second challenge was the need of Thai language for interviews with local farmers and organization, using a translator always limits the transcription and understanding of ideas relayed by interviewees. Finally, during the data analysis part, one of the challenges was the scoping of relevant and irrelevant data. Agriculture, Sustainable Development and Food Security are keywords that can be developed and talked about for a long period of time, leading some interviewees to be out of topics during their responses. For example, a huge tendency to talk about other irrigation projects that are not parts of the KLCM was witnessed. This information would be relevant in a comparative study. However it is not the approach followed by this research.

[6] Using Zoom meeting, Line and WhatsApp for videocalls.

The study of indirect development following the dams and irrigation constructions is important to completely understand the impact of such project on a region eco-social and environmental context. It was also seen that impacted communities were not the one that was gaining the benefits of the dams, so it is needed to separate farmers into two different groups as well between the impacted one and the receiver of irrigation development. All this information was cited during the interviews, as they are relevant to the general plan of water management, but they were not included as variables in this paper. Second research should put more importance to this knowledge to have a balanced understanding of sector dynamics in a region and their interdependence over natural resources.

This study focused on stakeholders' position in decision-making processes over water management and agricultural development. The actors targeted during the data collection are mainly of political/diplomatic and environmental order, the inclusion of economic development variables is limited. Furthermore, the study was mainly conducted in English, limiting the number of accessible key informants on local levels, and is calling for a need to rely on a larger representation of local farmers and population through associations and cooperatives. Using English during the data collection also limited access to local data, mainly from farmers that are communicating in Thai or dialects.

5.3 Recommendations

As scale is important into developing suitable and participatory water management projects that will answer to local needs and improve agricultural productivity, the turn towards the promotion of small-scale projects is necessary to

ensure this form of development. Researching and analyzing the government's will to transition from a large-scale project to small-scale project could be a relevant way to understand the vision the government has over agriculture and natural resources management improvement. It would also highlight the challenges faced to the process to this transition and how to solve them in a sustainable way.

In terms of "Participation," it was seen as a subjective term with different interpretations. This research does not provide an extensive comprehension of the ideas and concepts around participation, furthering the research into understanding the variables that can influence what should be considered participation and how, would lead to a better definition of the concept, and then the development of relevant systems of assessment of it.

To encourage local participation for sustainable development, the diversity of representation in the regional committee and authorities need to be improved. By including NGOs and Cooperative representative in decision-making discussion, a wider scope of knowledge can be elaborated and applied. Secondly, water reducing farming methods need to be promoted in rice crop farms, and knowledge to build around them have to be improved to understand cost-benefice value and reducing of inputs in production.

APPENDIX

Interview with NGOs and International Organizations key informants

Date and Time:

Position:

Organization's field of action:

Designation for this research:

Questions

1. Could you please introduce yourself, your profession, and the how long have you been involved with the water management and local agriculture issues?
2. In the region, what do you think are the main challenges for farmers? Are they related to water accessibility and management (if yes, can you develop the idea and/or give an example)?
3. Were the local farmers consulted prior to the development of large-scale irrigation project in the region to understand it's needs?
4. In this case, does the government promotion of participation in its policies is followed?
5. In your processus of developing local irrigation and agriculture, how do you process? How much is invested in it? Did it reach the goals previously established?
6. What are the main challenges faced by implementation of a new projects? How do you process to solve them?
7. Are the irrigation projects in the region focusing on economic, social and environmental development in a balanced way? If not, which are/is lacking and in what way?
8. How do you define the level of involvement of small stakeholders in project implementation and application? Do you think they are looking for an increasing involvement over decision-making in water management, and do they want to gain some authority in the process?

9. Each interviewee needs to place the role of small stakeholders they think endorse by referring to the OECD scale system provided[7]:

- Communication
- Representation
- Consultation
- Partnerships
- Participation
- Co-decision/Co-production

What would explain such a choice? (Any example?)

10. What skills you think are needed to ensure farmers participation in the project? Is their any access to education/formation given in case they lack some of them? Are they looking for this knowledge and development?

11. How do you qualify the collaboration between the authorities in charge of the irrigation project and the local representation? Was the communication between them efficient? And with NGOs?

12. In the decision-making process, do you think farmers activities and opinions are recognized and are they allocated some autonomy in their role?

13. In your opinion, should local farmers be allocated an higher level of influence in decision-making over irrigation project?

14. Have we already witnessed forms of empowerment gained by local farmers that were proven to be sustainable to their recognition?

15. Based on your experience, what recommendation do you have to increase empowerment in rice producers' participation over irrigation management and decisions?

16. What lessons have you learned from the challenges and downsides of empowerment initiatives that you experienced? Would you apply these lessons in the future?

[7] See Tools document 1. Each participant will be provided with an explanation files of the chart.

Interview with Government Officials key informants

Date and Time:

Position:

Office: Country:

Designation for this research:

Questions

1. Could you please introduce yourself, your profession, and how long have you been involved with the water management and/or agriculture office?
2. In the region, what are recognized as the main challenges for farmers? Are they related to water accessibility and management (if yes, can you develop the idea and/or give an example)?
3. How did you get access to this information? Do local representations take part in analysing needs to set up new projects/plans?
4. What are your thoughts about stakeholders' involvement? What are the benefices and challenges of them being active in the decision making and knowledge building over an large-scale irrigation project?
5. Did the new management plans learn from the previous faults of the "Khong-Chi-Mun" water project? What are the main obstacles into implementing the new projects?
6. What are the improvements expected? How much are invested in it? What are the average rate of success in a large-scale irrigation project?
7. Are the irrigation projects in the region focusing on economic, social and environmental development in a balanced way? If not, which are/is lacking and in what way? How are you trying to includes all aspects?
8. Each interviewee needs to place the role of small stakeholders they think endorse by referring to the OECD scale system provided[8]:

- Communication
- Representation
- Consultation
- Partnerships

[8] See Tools document 1. Each participant will be provided with an explanation files of the chart.

- Participation
- Co-decision/Co-production

What would explain such a choice? (Any example?)

9. What are needed to enforce farmers participation in the project? Is their any access to education/formation given in case they lack some of them? Are they looking for this knowledge and development?

10. How do you collaborate with stakeholders over irrigation project and what are the criteria of selection of selected stakeholders? Are their challenges in communication/collaboration with them?

11. In the decision-making process, do you think farmers activities and opinions are recognized and are they allocated some autonomy in their role?

12. In your opinion, should local farmers be allocated an higher level of influence in decision-making over irrigation project?

13. Have you already witnessed forms of empowerment gained by local farmers that were proven to be sustainable to their recognition?

14. Based on your experience, what recommendation do you have to increase empowerment in rice producers' participation over irrigation management and decisions?

15. What lessons have you learned from the challenges and downsides of empowerment initiatives that you experienced? Would you apply these lessons in the future?

Interview with Farmers key informants

Date and Time:

Region: Profession:

Designation for this research:

Questions

1. Could you please introduce yourself, your profession and the time you've been exercising it?
2. In the region and based on your own experience, what do you think are the main challenges for farmers? Are they related to water accessibility and management (if yes, can you develop the idea and/or give an example)?
3. Were the local farmers consulted prior to the development of the Si Song Rak water gate to understand the need in the region?
4. Do rice cultivators seek an increasing involvement over decision-making in water management?
5. What are the failures in the past project? What are the benefits you experienced?
6. What do you think should be focused on to improve your situation as a farmer ?
7. Each interviewee needs to place the role of stakeholders by referring to the OECD scale system provided[9]:

- Communication
- Representation
- Consultation
- Partnerships
- Participation
- Co-decision/Co-production

What would explain such a choice? (Any example?)

8. Are their skills you think you need to gain to increase your farming production? Do you have access to the knowledge for it?

[9] See Tools document 1. Each participant will be provided with an explanation files of the chart.

9. How did you collaborate with the authorities in charge of the irrigation project and was the communication between the actor efficient?
10. Were you given recognition for your contribution? Did your actions/opinions have an impact on decisions taken?
11. Did you feel a sense of autonomy in your role/task, including decision-making and leadership opportunities?
12. What are the main challenges you observed in the cooperation with the decision-making authorities and how could they be addressed?
13. Do you think that the level of influence you had was representative of your skills and your position?
14. Do you think this participation and empowerment have a long-term impact on your personal development? And on the position your community is holding in the decision-making process over agricultural water management?
15. Based on your experience, what recommendation do you have to increase empowerment in rice producers' participation over irrigation management and decisions?
16. What lessons have you learned from the challenges and downsides of empowerment initiatives that you experienced? Would you apply these lessons in the future?

Data collection tools 1

OECD participation chart

Organisation for Economic Co-operation and Development (OECD) is an international organization that focus on the development of policies. Their target is to establish equality, prosperity, and opportunity through such activities.

Process	Intention
Co-decision and Co-production	- Fair and inclusive share of power among stakeholders involved
Partnerships	- Agreed-upon collaboration between stakeholders. - Presence of Joint-Agreements
Representation	- Structural level of engagement with the objective to develop collective choice. - Included in the organization structure most of the time
Participation	- Give opportunities to take part in the policy process - Does not promise that participants have an influence over decision making
Consultation	- Gather comments, perception, information and experience of stakeholders - No obligation to take stakeholders' views into consideration in the final decisions.
Communication	- Make information and data available to other parties - Share information unilaterally, bilaterally or multilaterally - Make targeted audience more knowledgeable and sensitive to specific issue - Encourage stakeholders to relate to the issue and take action

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