KASETSART UNIVERSITY
FACULTY OF SOCIAL SCIENCES

IPB University
Fakultas Ekologi Manusia

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The 2022 KU Social Sciences International Conference:

Roles of Social Sciences in Sustainability Transformation in the Global South

June 9, 2022 9.00-17.15 hrs. (GMT+7)

The 2022 KU Social Sciences International Conference:

Roles of Social Sciences in Sustainability Transformation in the Global South

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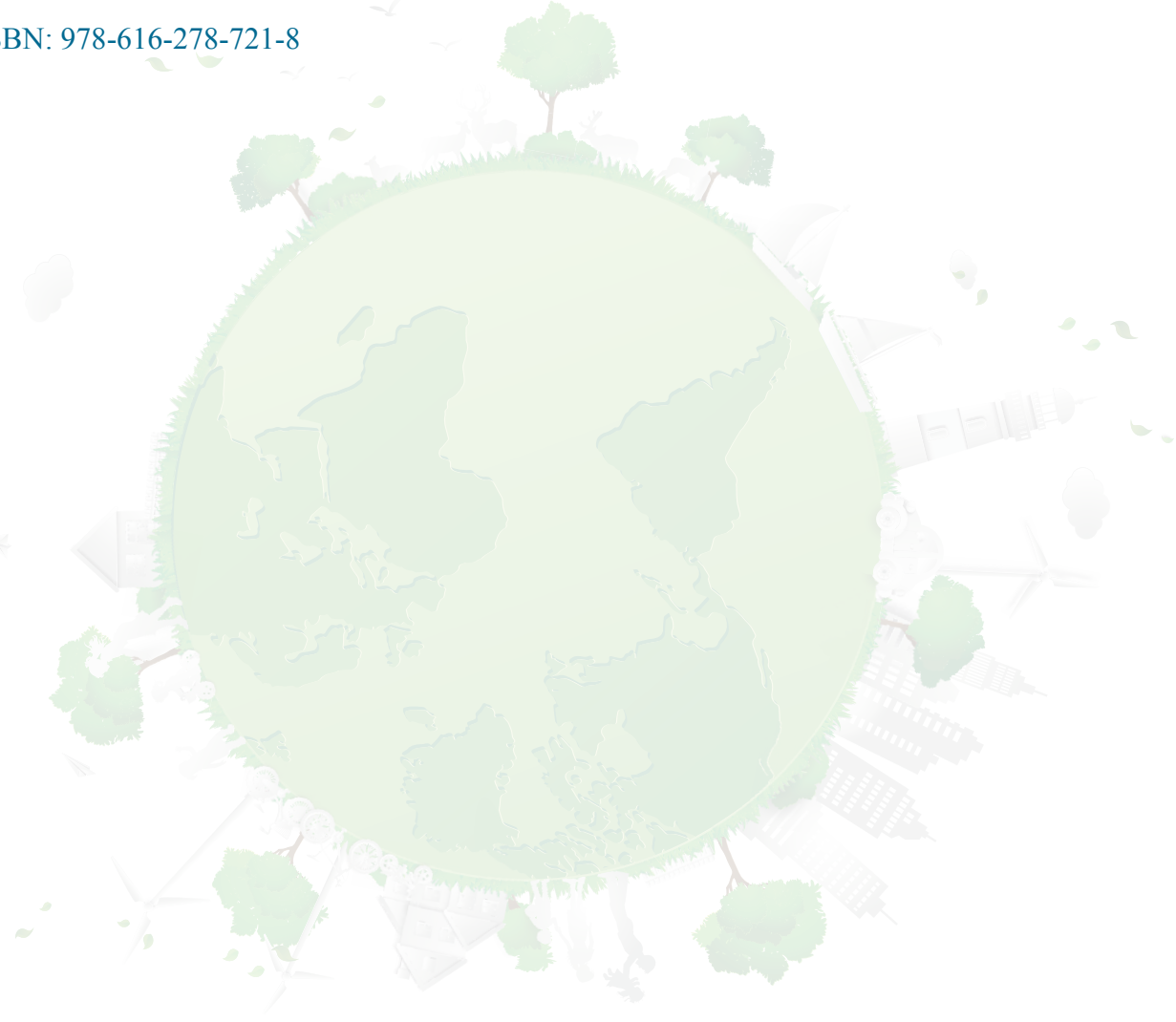

Editorial Board:

CONFERENCE THEME

There remains little doubt that if the world is to achieve its sustainability goals in the decades to come, much has to change in the various societal systems that cause environmental degradation, drive climate change and promote inequality. There is also little doubt that accomplishing the required transformations in the ways we extract, produce, consume, share, manage and learn, represents an unprecedented challenge for societies rich and poor. While our ultimate goals are becoming increasingly clear, important questions remain about the best possible ways to achieve them. Our options are plentiful, ranging from transforming socio-ecological and socio-economic practices at the local scale, via replacing unsustainable technologies by sustainable ones, to altering the globally prevailing economic and political paradigms that keep us focused on the accumulation of wealth and reluctant to share. But which strategies are likely to be the most effective and feasible? And how are transformations of practices, socio-technological systems and paradigms best triggered and governed? Can we achieve them with help of traditional policy instruments or do we need more revolutionary means? Can we rely on governments to pull us through, or do we need to build broader coalitions of transition drivers and managers first?

Such and other questions are even more acute in the Global South, where, compared to the Global North, vulnerabilities to the adverse effects of environmental degradation and climate change tend to be larger and the conditions for the successful realization of sustainability transitions less favourable. The pandemic and the unfolding climate crisis have mercilessly exposed the fact that despite all recent progress the Global South has seen in economic development, health care and other realms, conditions in many parts remain extremely fragile and vulnerable to backlash, with governments – not helped by the world's richer nations minding their own interests first – struggling to cope.

It is also in the Global South where, arguably, the need for new knowledge that can support sustainability transitions, is greatest. To develop that knowledge is a challenge in itself, and may even require a transformation of existing practices and systems of knowledge creation and sharing, not only in government but also in academia and other sectors. An important role in this would seem to be reserved for the social sciences. Not only because sustainability transformations are, in many cases, very much a matter of organizing societies' responses to particular challenges, but also because the social sciences, perhaps like no other disciplines, should be able to play a connecting role between ecology, technology, economy and governance.

Kasetsart University's Faculty of Social Sciences' first international conference seeks to engage with these daunting challenges of transformation and knowledge creation. The conference, which is organized in collaboration with the Office of the Royal Society of Thailand, Faculty of Liberal Arts, Ubon Ratchathani University, Faculty of Human Ecology, Bogor Agricultural University, Centre for Asian Studies, University of Ghana, and Eastern Regional Organization of Public Administration, particularly aims to investigate how social sciences across the Global South may contribute to the conception, design and implementation of the many sustainability transformations that will need to be completed if countries and people across the Global South are to continue to experience sustainable improvement in their lives and livelihoods.

We warmly invite you to join us in this effort, be that as partner, contributor, or member of the audience.

ACKNOWLEDGEMENTS

First and foremost, the Faculty of Social Sciences and the Conference Organizing Committee, would like to deeply thank the Ministry of Higher Education, Science, Research and Innovation, and Kasetsart University for providing partial financial support for the organization of the 2022 KU Social Sciences International Conference titled "Roles of Social Sciences in Sustainability Transformation in the Global South", an event that was also organized as part of the celebration of the 48th anniversary of the Faculty of Social Sciences and the upcoming 80th anniversary of Kasetsart University.

We would also like to express our heartfelt gratitude to our co-host organizations, namely Eastern Regional Organization for Public Administration and the National College of Public Administration and Governance, University of the Philippines; the Faculty of Human Ecology, IPB University, Bogor, Indonesia; the Centre for Asian Studies (CAS), University of Ghana; the Faculty of Liberal Arts, Ubon Ratchathani University; and the Office of the Royal Society, Thailand. Special gratitude also goes to the highly knowledgeable speakers who gave their valuable time to share their knowledge and thoughts with the conference participants. Special gratitude goes to Honourable Mr. Mechai Viravaidya, Professor Dr. Alex Bello Brillantes,Jr., Mr. Philippe Peycam, Mr. Sridhar Dharmapuri, Associate Professor Dr. Witsanu Attavanich and all other distinguished speakers. Special thanks also go to our advisors, including Assoc. Professor Sida Sornsri. Your assistance in shaping and promoting the event has been indispensable. We would also like to express our sincere gratitude to all acclaimed academics from our partner institutions, who gave their valuable time to peer review the conference papers. Your contributions are very much appreciated.

Last but certainly not least, the competent people at the Faculty of Social Sciences deserve our gratitude for initiating and creating this international conference, the first edition of what we aim to develop into a recurrent event.

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CONFERENCE PROGRAMME

Time	Activities
9.00 - 9.15	**Opening Ceremony** • Opening Remarks by Dr. Chongrak Wacharinrat (President of Kasetsart University) • Welcoming Remarks by Assistant Professor Wing Commander Dr. Ngamlamai Piolueang (Dean, Faculty of Social Sciences, Kasetsart University) • Overview of the International conference • Overview of panel discussion and roundtable • Photo Session
9.15 - 10.00	**Keynote 1** **Framing the Sustainability Transformation Challenge in the Global South from a Social Sciences Perspective** by Honourable Mr. Meechai Viravaidya (Trustee, Thailand Development Research Institute (TDRI); Founder and Chairman of Population and Community Development Association, Population and Development International, Mechai Viravaidya Foundation and Mechai Bamboo School)
10.00 - 10.45	**Keynote 2** **Sustainable Development and Good Governance in Designing for Transformation in the Global South** by Professor Dr. Alex Bello Brillantes, Jr. (Secretary General, Eastern Regional Organization for Public Administration: EROPA)
10.45 - 11.00	Break
11.00 - 12.00	**Panel Discussion** **Achieving Sustainability Transformations through social Innovation: Past, Present, and the Way Forward** **Panelists:** Renaud Mayer (Resident Representative to Thailand, United Nations Development Programme; UNDP) Mark M. Anderson (Director, Research and Innovation Office, Glasgow Caledonian University) Dr. Sandro Calvani (Senior Adviser on Strategic Planning, Mae Fah Luang Foundation: Under Royal Patronage) Assistant Professor Chol Bunnag (Director, Sustainable Development Solutions Network: SDSN, Thammasat University) **Chairperson:** Assistant Professor Dr. Nadhawee Bunnag (Associate Dean for International Affairs, Faculty of Social Sciences, Kasetsart University)

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Time	Activities
12.00 - 13.00	VDO clip Presentation by students on "Youth as Sustainable Changemakers" (Winners of Student Video Award) and speech by students from the Faculty of Social Sciences on the same topic.
13.00 - 15.00	**Parallel Sessions** (live session) **Breakout room 1**: **Special Lecture 1** **Challenges of Agri-food System Transformation in the Global South: Sustainability and Resilience** by Sridhar Dharmapuri (Senior Food Safety and Nutrition Officer, FAO) **Special Lecture 2** **Climate Changes Impacts and Strategies for Mitigation and Adaptation in the Agriculture and Food Sector** by Associate Professor Dr. Witsanu Attavanich (Faculty of Economics, Kasetsart University)
	Oral Presentation Rooms **Breakout room 2: People, Power, and Promotion of Sustainability** **Chairperson:** Associate Professor Srida Sornsri **Secretary:** Dr. Worathanik Photijak (Department of Thai and Communication, Faculty of Liberal Arts, Ubon Ratchathani University) - Economic and Military Roles and significance of State's Civil Conscription of Siam in Ayutthaya Period (Sitthard Srikotr and Warangana Nibhatsukhkij) - The Motivatioal Constructs of Students in Higher Educational Institutions During the COVID-19 Pandemic in Davao City (Ronie G. Panes and Sharon P. Petilla) - The Social Innovation for Managing the COVID-19 Pandemic Based on Java's Village Internationalization in the Digital Era (Lala Mulyowibowo Kolopakinga, Eko Wahyono and Nissa Kaniac) - The Promotion of Sustainable Cultural Tourism of Local Alike Company (Sutthida Sakidjai and Nadhawee Bunnag)

CONFERENCE PROGRAMME

Time	Activities
13.00 - 15.00	**Breakout room 3: Models, Management, and Measurement of Social Sustainability** **Chairperson:** Associate Professor Dr. Tanaradee Khumya (Department of Sociology and Anthropology, Kasetsart University) **Secretary:** Dr. Nungfan Jenjirathitikarn (Department of Psychology, Kasetsart University) - Community Participation in Reduce, Reuse and Recycle to Preserve Cikapundung River Basin, Bundung, West Java, Indonesia (Siti Amanah and others) - A Review of Frameworks for Evaluating Online Corporate Sustainability Communications (Chanapa Itdhiamornkulchai and Tatri Taiphapoon) **Breakout room 4: Technology-Based Social Sustainability Transformation** **Chairpersons:** Professor Dr. Rilus A. Kinseng (IPB University) Dr. Chomchid Phromsin (Department of Geography, Kasetsart University) **Secretary:** Dr. Thepthai Chaithong (Department of Geography, Kasetsart University) - Assessing Youth Engagement to Agricultural Activities at Central Luzon Philippines: Basis for the Development of Infomediary Material (John Romar A. Pedrigal) - Development of Healthy Food through Organic Farming Based on Bio-cyclo Technology in Peri-Urban Communities (Sumardjo, Adi Firmansyah and Leonard Dharmawan) - E-Government Adoption of Local Governments in the Philippines (Catherine A. De Castroa and Errol G. De Castrob)
15.00 - 15.15	Break
15.15 - 16.00	**Keynote 3** **Sustaining Transformative Developments through Academic Inter-Regional Collaboration: the Role of IIAS** by Philippe M.F. Peycam (Director, International Institute of Asian Studies: IIAS)

CONFERENCE PROGRAMME

Time	Activities
16.00 - 17.00	**Roundtable** **Social Sciences and the Sustainability Transformation Challenges: Are We Up to the Task?** **Roundtable Participants:** Professor Dr. Rilus A. Kinseng (Bogor Agricultural University: IPB) Dr. Lloyd G.A. Amoah (Director, Centre for Asian Studies, University of Ghana) Assistant Professor Wing Commander Dr. Ngamlamai Piolueang (Dean, Faculty of Social Sciences, Kasetsart University) Dr. Pakamas Thinphanga (Urban Climate Resilience Expert) Associate Professor Dr. Hebe Verrest (University of Amsterdam) **Chairperson:** Dr. Bart Lambregts (Faculty of Social Sciences, Kasetsart University)
17.00 - 17.15	Wrap up and Close

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OPENING REMARKS

Dr. Chongrak Wacharinrat

President of Kasetsart University

Your Excellency, distinguished delegates, ladies and gentlemen,

It is a great honor and pleasure for me to welcome you on behalf of Kasetsart University to the 2022 KU Social Sciences International Conference, Role of the Social Sciences in Sustainability Transformation in the Global South. We at KU are very excited today, as this conference is the first edition of what we plan to develop into a recurrent event.

Today, we look forward the fruitful exchange of ideas and experiences on some of the urgent challenges facing the social sciences as an academic discipline. And we hope to lay the foundations for lasting collaborations between institutions which are committed to gaining a better understanding and providing solutions to the issues confronting the global community. We live in an unpredictable, rapidly changing world. But let us focus on today's event first.

We all understand that if our world is to achieve its sustainability goals, improve the various systems and practices that currently cause environmental degradation, confront climate change, and promote inequality… we all will need to change.

We also know that the challenges are great. We are required to achieve transformations in the methods we extract and manage our limited natural resources, produce and market our goods, and share our wealth. These are challenges for all sectors of our societies, rich and poor, private and governmental.

While our ultimate goals are increasingly clear, the best possible ways to achieve them remain topics for immediate intensive research, serious consideration, and critical debate.

Several options are available to us. They include the transformation of local socio-ecological and socio-economic practices, and the substitution of unsustainable technologies for sustainable ones. We must consider altering the larger economic norms and practices that have too often focused on the accumulation of wealth, often at the cost of more important matters.

Which strategies are likely to be the most effective and feasible? And how are transformations of practices, socio-technological systems, and paradigms best initiated and successfully completed? Can we achieve them by relying on regulations and policy instruments? Who are the most appropriate change agents ... governmental or private entities, or an alliance of both?

These and other questions are especially acute in the Global South. I am aware that the adverse effects of environmental degradation and climate change has had a particularly large impact on the Global South.

Unfortunately, sustainability transitions may be harder to achieve in the Global South, therefore the need for new knowledge that can support sustainability transitions, is greatest in our region of the world.

Developing this new knowledge is a challenge in itself. It will require research, dedication, innovation, and collaboration from and among a wide range of knowledge-creating actors, both academic and non-academic.

The social sciences are well-positioned to play an integrating role ... involving disciplines of ecology, technology, economy, agriculture, sociology, and governance.

Ladies and gentlemen, let me wrap up. It is time to sincerely address these difficult challenges, and to urgently explore the role that the social sciences should play in finding solutions and encouraging transformation.

It is my wish that at the end of the day, you will have constructed a clearer picture of the transformational challenges ahead for us, and developed a better understanding of what the social sciences, in particular, can do to manage them.

On behalf of Kasetsart University, I wish you a very inspiring and fruitful virtual meeting. Thank you very much.

WELCOMING REMARKS

Assistant Professor
Wg.Cdr. Dr. Ngamlamai Piolueang
Dean, Faculty of Social Sciences, Kasetsart University

Dear Excellencies, distinguished delegates, ladies and gentlemen,

A warm welcome to this first edition of the KU Social Sciences International Conference titled "Roles of Social Sciences in Sustainability Transformation in the Global South".

I am delighted to see so many of you having tuned in today, not only from Thailand but also from places further away such as the Philippines, Indonesia, Ghana, the United Kingdom, Malaysia and the Netherlands. It is a great pleasure to have all of you – virtually – here.

I wish we would have been able to meet in person, at our beautiful green campus in Bangkok, but sadly, Covid-19 is still forcing our hands. Future editions of this conference, hopefully, will give us plenty of opportunities to make up for that.

Today's event is organized as part of the celebration of the 48th anniversary of the Faculty of Social Sciences, Kasetsart University, and the upcoming 80th anniversary of Kasetsart University.

As President Jongrak Wacharinrak already mentioned earlier, for us at the Faculty of Social Sciences, Kasetsart University, and our co-host organizations, today's event is not just another conference, but also a stepping stone in the university's strategy to promote sustainable development, and the start of a more dedicated process aimed at furthering the role of the social sciences in sustainability transitions.

To start with the former, Kasetsart University has been actively aligning its mission and activities with the world's Sustainable Development Goals. The university, through a range of projects, is actively reducing its environmental footprint and well on the way to becoming a 'green' university in more than one dimension. Kasetsart University's attempt to work towards sustainability has been widely recognized. According to Time Higher Education Impact ranking 2021, for instance, Kasetsart University ranks first in Thailand and 17th in the world for its work in the four areas of teaching, research, outreach and stewardship to achieve SDG 2: Zero Hunger. It also ranks 4th in Thailand in its work toward SDG 13 Climate Action and SDG 14 Life Below Water. In addition, the university has introduced a portfolio of General Education courses focusing on the Sustainable Development Goals. Sustainable development goals are incorporated in and inspiring

several general educational and specialized courses for Kasetsart University students, all to make sure that our students have the SDGs firmly in mind when they enter the 'real' world. Finally, the university encourages its faculties, schools and centres to let the SDGs guide their researches and educational activities.

It is especially in this regard that I am very pleased to see our Faculty of Social Sciences picking up the gauntlet with today's event. Sustainable development ranks high among the faculty's missions and goals. More in particular, the faculty conducts its teaching, research, academic services and all other works guided by the vision that in 2023 the faculty will be a leader in the integration of the social sciences for the sustainable development of all. To this end, the faculty actively develops curricula aimed at the integration of various social sciences disciplines. We do this, first, to increase our capability to respond to societal and sustainable development needs; second, to let our academic, research, and academic services works contribute more directly to sustainable societal development; and third, to - hopefully – become an internationally recognized contributor to this field.

Against this background, today's central question: *how social sciences across the Global South can contribute to the conception, design and implementation of sustainability transformations*, I believe, is an urgent one that deserves our attention. It is perhaps too often and too easily that we tend to look at engineers and environmental scientists for solutions to our sustainability problems, ignoring the fact that all too often it is human behaviour that underlies our problems. To acknowledge this fact means recognizing that, when we are talking about sustainability transformations, accomplishing behavioural change is as important as realizing technological improvements, and that in consequence, the social sciences have a key role to play in safeguarding our planet and future.

What role or roles exactly the social sciences, particularly in the Global South, should or may play, is an open question still. Luckily, we have among us today a variety of highly knowledgeable speakers who will lead us the way. I am particularly thrilled by the presence of Honourable Mr. Mechai Viravaidya, Professor Dr. Alex Bello Brillantes,Jr., Mr. Philippe Peycam, Mr. Sridhar Dharmapuri, Associate Professor Dr. Witsanu Attavanich and all other distinguished speakers today who together boast many decades of experience with initiating, managing, and studying social change. Their contributions, and those of others, I am sure, will inspire us and help us to forge ahead.

Before I hand over my virtual mic, I would like to express my heartfelt gratitude to our collaborators in the preparation of today's great event. I am delighted and thankful to see many representatives of our co-host organizations being with us today. These include: Professor Dr. Alex Bello Brillantes, Jr., representative of the Eastern Regional Organization for Public

Administration and the National College of Public Administration & Governance, University of the Philippines; Associate Professor Dr. Siti Amanah, Associate Dean for Student Affairs, representative of the Faculty of Human Ecology, IPB University, Bogor, Indonesia; Dr. Lloyd G A Amoah, representative of the Centre for Asian Studies (CAS), University of Ghana; Assistant Professor Dr. Pinwadee Srisupan, Associate Dean for Research and Planning, representative of the Faculty of Liberal Arts, Ubon Ratchathani University; and Miss Piyaratt Inorn, Director of Moral and Political Sciences Division, representative of the Office of the Royal Society, Thailand. My gratitude also extends to our advisors, including Assoc. Professor Sida Sornsri. Your assistance in shaping and promoting the event has been indispensable.

Special thanks also go out to Kasetsart University, for their kind financial support. The competent people at the Faculty of Social Sciences, finally, deserve our respect for initiating and creating today's event.

Dear ladies and gentlemen,

It is time now for me to conclude this address. I wish you a highly productive and very instructive day, and I now hand you over to the capable hands of our MC for the day, Assistant Prof. Dr. Pailin Kittisereechai.

Thank you very much.

KEYNOTE ADDRESS 1

Honourable Mr. Meechai Viravaidya

Framing the Sustainability Transformation Challenge in the Global South from a Social Sciences Perspective

Good morning, everyone. Thank you for inviting me to join your group and I hope what I have to say will be of some use to your future studies. What I would like to do is to discuss the issues that we have carried out over the last 47-48 years by the Population and Community Development Association. What we did was to put in changes, Five Journeys to improve the quality of life in Thailand.

Our Five Journeys were 1. to reduce births; 2. to reduced deaths; 3. to reduce Financial dependence from donors; 4. to reduce poverty; and, 5. to reduce ignorance. This has been continuous from the beginning, for 47 years. So, the current activity at the moment is number 5, on the new education system that we have introduced. We began back in the early 1970s. The first one was to reduce births. On our guiding principles, first, is to take 'no' as a question. We do not accept people who reject the suggestion. We will go back to them again and again, and again. So we take 'no' as a question. Second, Be Innovative. Don't do something that is passed down. Think outside the box, even outside the fence. And very importantly, is to empower the people you're trying to help. Get them to help you. Rather than one-way, it's got to be two-way. Finally, ensure sustainability to make sure it works. Ensuring sustainability is extremely important. These has been our work for the last 47 years.

1st Journey: Reducing Births

The first journey is to reduce births. In 1974, Thailand had seven children per family and it was not sustainable. We eventually convinced the government after many, many years to introduce the Family Planning program. It was difficult, but it eventually worked. But, before we did it, we wanted to know what religion was practiced in the Philippines. The Catholic church does not support Family Planning. So, we wanted to know what Buddhism thought about family planning. We found that there were so many quotes in Buddhist scriptures that support family planning. In particular, births. Many births cause suffering. These are prayer fans that were produced and given out to the whole country with a message from the Buddhist scriptures and, even in English,

that, “Many births cause suffering.” This became an area where my people didn't have to question whether religion is against it. But what happened next is the villagers ask the monks to bless the contraceptives with holy water. So, I asked a monk in Bangkok, and he agreed to sprinkle holy water. This was 47 years ago. I was holding the bowl, and he was sprinkling holy water on pills and condoms. They said, for the sanctity of the family, because that's what they have done on everything - a new motorcycle, a new room, a new house. So, this was their proposal. In other words, we have to listen to our target audience.

Then, the next fun (activity) was that we needed to go through the education system. So, we trained 320000 school teachers on Family Planning. Introducing new alphabets - B for Birth, C for Condom. I for IUD. So, that they would understand, and talk to the parents about this. This is a condom blowing championship for the teachers to reduce embarrassment, so that the people, the teachers become relaxed about condoms. We recruited villages to help us promote understanding of Family Planning. Here is a village family planning volunteer - a shopkeeper. We asked the villagers, “Who would you propose to be your representative?” Almost all, to the last person, said the local shopkeeper. So, we train the local shopkeeper and the wife to provide family planning. This eventually covered 100% of the villages and these Family Planning volunteers eventually became village health volunteers run by the government and they did such a good job in the prevention of spread of covid in Thailand. The work goes back to 47 years ago in Family Planning. We also wanted to make sure that wherever there were people, there were contraceptives. Contraceptives everywhere. So, it became part of the system. And even in hairdressers. Mostly, they are women. She will give you a 10% discount on your hairdo, if you take the pills. All these things came as a suggestion from the community. So, basically we pioneered, 47 years ago, a community-based contraceptive distribution network by training village shopkeepers to supply contraceptives. This was the first time a country had launched a community-based contraceptive distribution system in rural areas, and was later, as I said, adopted by the government to its national network of health volunteers.

So this is a very clear system that even today, most countries still require doctors to prescribe the pill, but we believe it was sensible to get ordinary people to help prescribe the pill. In the beginning, you need a doctor to prescribe the pill. But, we had one doctor for 110,000 people. So, that was out of the question. Then, we got nurses and midwives to join in. They prescribed the pill, but that only covered 20% of the villagers. And that was the last person in line. So, that's why we came next, to the village shopkeeper. And we have 10-or-22,000 villagers. And later on, the programme was expanded by the ministry of health. We started as a non-profit organization and then handed over to the government. The people pay a small amount for the contraceptives, but if they could not pay, they could do community service, and still get the service. We wanted to show

that what we have had value. We are not giving it away for free. So what happened after several years? 7 children became 1.5 children, and population growth rate of 3.3%, which meant doubling every 25 years, to 0.4%. Interestingly, we compare this to the Philippines during the same time. We both had 36 million in 1970. In 2018, Thailand had 69, the Philippines had 107 million. So, we believe that our work has helped us to reduce the population growth rate and tried to solve the issues of poverty. We haven't done that yet. But it's improved.

Second Journey: Reducing Deaths

The next journey was a continuation of the first one. When AIDS hit Thailand in the 1980s and the government reaction was total denial. It did not want anything to be public information, because they thought it would scare away tourists. It would harm tourism, which of course was untrue. So, I face this with one of the ministers in charge of public broadcasting. What did I do? I change the tact and ask for another connection. So, they have denial. What we did was we took no as a question and went to the army; Commander-in-chief of the army and asked him whether we could use 300 radio stations and 2 television networks. I told him the statistics - how many people would be infected, including military recruits - and he agreed. Here, we took no as a question and got 300 radio stations and 2 television networks of the military to provide information.

And then, in 1991, we had a new Prime Minister, Khun Anand. He decided to take it seriously and became the chairman of the National AIDS Committee. Not the Minister of Health, but the Prime Minister, because you need a strong committee. Then, I was part of the cabinet and; so, I helped him on this. Then, there was a 50-fold increase in the government budget for HIV/AIDS. Every government department has to be involved in training, understanding, and talking to people. This is bringing all the media people together to say that we must be open and honest, but do not scare people. We shared that we, now, would have television spots and radio spots every hour of broadcast. For half a minute, we gave them half a minute extra to advertise and earn money. So it's a win-win situation. So this also helped, every hour broadcast throughout the day and night with AIDS information.

Then, we went to the business community, in factories. We said to them "Sick staff don't work. Dead customers don't buy." So, you need to be involved in educating your staff, and educating your customers. Then, we went to universities and educational institutions. We got university students trained and went back to their secondary schools. And we got secondary schools to join in and train their younger brothers and sisters. Then, finally, the primary school children in every village, where a package of information and condoms are given out to every household. These are the cards on AIDS. We've developed AIDS safety tips by companies, by Avon, by the banks, by American International insurance, and so on. We said we believed that if we want to win, we need

the cooperation of the private sector. They have to understand and participate.And this was at their cost. Then, we had condoms given out everywhere, and AIDS information - at bus stops, at toll gates. So, everywhere people went, they were messages being given out. Even in traffic, when there was a traffic jam, police came out and gave out condoms and AIDS information. So, we covered everybody. And so, what happened after all these activities between 1991 and 2003? In about 12 years, the UNAIDS said that there was a decline in new infections by 90%, and the World Bank said that during this time 7.7 million lives had been saved. They said that this could have reached 10 million by the year 2017. So, in other words, what could have happened? The cost of inaction would have been catastrophic; so, we have to tell people who want to be change makers to go ahead, and move ahead, and take 'no' as a question, as long as you have the facts, you have the truth and there's no other motive.

3rd Journey: Reducing Poverty

The third journey was to reduce poverty. By helping the poor out of poverty. By partnering rural villages with companies. People in companies know how to make money. Governments don't know how to make money. They only know how to take money. So, we've got the companies to join in to partner with poor villages. The company helped teach them how to do business. We did not use the 'handout approach'. Everything was different. The handout approach does not foster new skills. It does not empower and it creates greater dependence. These things are not the things we want. So this endeavor aims to empower the community and to turn the poor into entrepreneurs, by providing business skills and access to credit. We believe that access to credit for the poor must be a human right. That's what we decided to do and we did it. The money came from the business community and in partnership with the villages to enable the poor to earn more income to pay for their basic necessities of life. We didn't give them anything free. So, to create self esteem, the money the company gave, the villagers have to, in turn, plant trees. Every tree was $3 or a 100 bath. In other words, they did not get the money for free. They planted the trees. The donor was quite happy when they saw the trees were coming up and, then, the revolving loan fund for the villagers.

This is the Village Development Bank, a fund operated by the villagers - half men, half women. Once you put a deposit, you earn 3%, and you borrow the loan at 1% per month. The elected gender-balanced committee operated the microcredit loan fund. 50% of the profit went back to the bank and the other 50% went to education, health, and elderly care, as voted in by the villages. So, this is their own bank, their own money.

Before you can borrow, you need to be trained. Here's a person in the village who is very good at pig raising. We asked that person to be the trainer. There were also flowers made from fish scales in the South. Also crab meat processing and cold storage. They were being exploited by the

companies, the merchants. So, now, they can keep their own storage without being exploited. With mushrooms also, they were being exploited by merchants, but now they can keep their own cold storage. So, self-esteem. Flowers, these are from the loan. Also here is one village that advanced the loan and they decided to have a business from the fund. They decided on water bottling, because they checked the quality was very strong. So, the village has its own water bottling plant. But what we did not expect to happen, and we were delighted, was that, all of a sudden, there is a new business venture - village water sellers. So, they became distributors of water around the village. In other words, by doing that water business, they created another set of businesses. This has empowered the villagers to help themselves and to eradicate poverty in 2,100 communities.

4th Journey: Reducing Financial Dependence on Donors

The next one was to reduce financial dependence on donors. We cannot expect donors to give us money forever. So, we have to also help ourselves by establishing social enterprises, which I call, 'business for social progress' to provide opportunities and income for the poor, beginning in 1975. We classified our businesses for social progress into two categories. One, was optimization of profits. The second one is maximization of profits. The first one was not to make a big profit, because we went with the poor, we could not charge much. But the next one, we work with people with cash. Here is one restaurant called, 'Cabbages and Condoms', which is very famous in Bangkok. This is the maximization. People with money came and we generated a lot of profit to be used and help other activities that were in optimization (category). This is the restaurant. It's still going on. Also, construction materials and building materials are also an optimization, not maximization profits. We want to keep the cost low for the villagers.

Then, we started our own social enterprise: chicken raising and training villagers. The idea was to earn money from the chicken, but also to provide free training for the villagers. So that we have both maximization and optimization. But then, after a while, the cost of chicken feed went up so high. We either had to go bankrupt or stop. So we stopped and then saw what alternative uses we can make of the chicken pens. We decided to turn it into a factory. Make it a room to be rented at half price. To rent them to companies, to bring the machines out. What we did was instead of sending people to machines or migrating. You bring machines to people. This is another one of changes and this still can be done. Rather than an industrial estate in town, we turned chicken pens to low-cost space to bring machines to people. At least five chicken pens had 1,000 people working. 200 in each chicken pen. All together in our factories, we had 15,000 workers by turning chicken pens into factories. This was a very successful activity. Here is making clothes in former chicken pens. Villagers have earned 8.8 billion baht during the twenty years of operation. Everything went well until companies moved their production to Vietnam, because the Thai government increased

the basic wage from 166 to 300 baht. Many companies could not afford it, so they went elsewhere - Vietnam, Laos, Cambodia. What we did was to try and turn it into smart farming. It does not make as much money, but we cannot just leave it alone. We have these Smart Farms growing chili, tomatoes in factory buildings. Also, people in wheelchairs can grow vegetables in our factory buildings. So, we turned the former chicken pen into smart vegetable farms. This was covered by UNAIDS Strategies to strengthen: NGO Capacity in resource mobilization through business activities. It can be downloaded for free.

5th Journey: Reducing Ignorance

The next one was reducing ignorance. We found that it was time to change the education system in Thailand. To make it meaningful, to the lives of people. Instead of being a school where you try to get a certificate and you learn nothing, we want a school to be a development center, a focal point of life in the village in the community. So I established the Bamboo school. It's very well-known. Here is the entrance of the Bamboo School. Basically, it's a school to foster future change makers and social entrepreneurs. So, here's a school that's designed to introduce change makers and make our school a genuine lifelong learning center for all the whole members of the community and to become a gateway for social and economic advancement in surrounding communities.

At this school, students learn life skills and occupational skills, in addition to academic skills. The objective of the school is to produce good citizens, who are honest and willing to share. We have corruption in Thailand and in many countries. Education system must address corruption. They must possess life skills and occupational skills, know how to manage and not give up, become social entrepreneurs and community development leaders, and practice and promote social equality. Not only gender, but every element of equality. So here is a geodesic dome made of bamboo at the school. It's the world's largest bamboo geodesic dome. The steel one is so much bigger. The architect came from Singapore. Here inside the school, we make colourful footpath, trees. The footpath also becomes a dictionary, as we walk you learn new words. My kind of school is colorful. Children love color, so they participate. Here they are learning words in Thai and English. Also on steps, how much energy you use going up each step.

Our students come from 31 provinces in Thailand out of 77. We also have Mon, Karen, Hmong ethnic minority groups. And we also have students from Laos, Myanmar, Vietnam, Cambodia. So these are the students. So we want young students to get together and learn that they have neighbors, rather than getting the Ministry of Foreign Affairs to do it. We should get students to do it. Many, many schools should have exchanges of secondary school students. Students help manage the school, not run by the teachers. We have a student government elected from each grade. The student committee helps to run every aspect of the school. For instance, all of them must play

music. Every student must play the ukulele. We get about 600 visitors per month. When they come, the students play music and then explain what the school is all about. Nothing to do with teachers. Here is when the Deputy Prime Minister, Minister of Foreign Affairs, Minister of Science and Technology, Minister of the Office of the Prime Minister came. Everything was explained by the students. They welcomed them and no teachers were to be found.

And this is the meeting of the Student Government. They have an agenda that is made every Friday evening. Anything that needs to be done, they must be involved in approving or rejecting things. Here's one example, all purchases are done by the students, not by their teachers. They go to the market. They organize and they buy on a monthly basis. And they go and check in the market with other suppliers - the meat, the vegetables. They go about at 4 a.m. to check all of this. It's a real business. And there's a committee that audits. They select and make sure everything is correct. The receipt is correct. The weight of the vegetable. The quality. And here is buying vehicles. We were given money by IKEA to help out the school. We needed five vehicles. So, the students organized themselves and went to three companies - Toyota, Nissan, and Isuzu. They checked and then finally decided on one brand and then went to see the chairman to ask for a reduction. All these vehicles were bought by students.

And here, we have to janitors. Many schools have janitors. We say no janitors. You must clean up your own work, clean up your own mess. The toilet, the bathroom, everything. And if you want to be a student at this school, you are interviewed and selected by all the student. Every year we have students who apply and they are interviewed. The parents are also interviewed by our students. And they select. And when a teacher wants a job, they have a written exam by students, and an interview by students. Teacher has to show how to teach. If they teach well, then the students will not hire them. Once the teachers are hired, the students must look after the teacher, because you hired them.

Another one is discipline. Today the world is going haywire on telephones. So they endanger a lot of quality in human beings. So, we allow one hour of telephone use per week. But before you get the telephone, you must write three letters, to somebody important, your friends, your parents. Also on that day, Saturday, we do not eat an evening meal to learn about hunger. You cannot learn about hunger from a book, or from a video. You have to learn about hunger by being hungry. Then, you will know how other people feel. Then, you are motivated to do something.

This is a Tissue Culture Lab. It's usually done in the 4th year of university, but we do it in Grade 7, because we believe there is a lot that needs to be done in secondary school, not wait until the university. So, they have a lab and they produce many things, many plants. This will be very, very good in the future, because we are agriculture-based. We have bananas. We are also growing marijuana. They're also making student-produced solar torches. They're making paper from

vegetable waste. Then, they go to another village and other schools to get them to make it. Here the paper is being dried, so the villagers make it and we buy from them and turn them into products. All the students have businesses. We have a loan fund for students. They can borrow money to make smoothies, ice cream, hand-painted umbrellas, and vegetables. Again, this is growing vegetables in cement rings, using little land, water and labor, because we want people in wheelchairs to be able to grow vegetables from a wheelchair. Again, using old car tires, you can color them. Student businesses also mushroom bags, good profit of 200%. And then, the bean sprouts. This is 250% net profit in 4 days. So, they learn how to do it and they know how much they can get per square meter of what sort of vegetables, rather than just growing it. Again, it's combining education and occupation.

Here are the students. You can see that this is typical Asia. The women are doing it and the men are watching. Here, they are making hydroponic pipes from PVC. Here's a hydroponic system operated by the 7th grade. And now bamboo hydroponics is made by students and painted again; so, it's much cheaper. They are growing melons and selling them online. They have grapes in the school. And there is a van that goes out to sell them in the market.

Parents and students pay school fees by performing 400 hours of community service and planting 400 trees each. We do not charge money. We want people to see goodness. Doing good has value, not just money. And every student should sit in a wheelchair, one day per month, to learn about the realities of life in a wheelchair. As a result, we came up with an idea of growing vegetables from wheelchairs. This came up by 10th graders, not the university, not the UN, not the Ministry of Agriculture; but tenth-grade students designing and raising the soil. This is training students from a school for those who are in wheelchairs, Srisangwan School in the north, to help their own vegetable farms. We've got money from the business community to set up a farm for them. They can now grow rice in cement rings, hydroponics in a wheelchair, mushrooms from a wheelchair. And then, the school for the hearing impaired students. They grow vegetables at school and now they can earn money. These are the students in year 10, 11, and 12. They can supply vegetables to local restaurants.

Also, every week the students must go out on a Wednesday to do community service. If you want to be a teacher, you go to teach primary school. Also we bring them in (children from the surrounding communities) to learn to swim in our swimming pool. Because four children die every day in Northeast Thailand from drowning. We also teach them dental hygiene and sex education. Students also prepare food to distribute weekly to hospital patients, give them, visit them, and also bring primary school students in to take a look at what a hospital looks like and that you need to help elderly people. Then they play music for them. These are all parts of life at the school.

Then, many schools came out and asked whether we could help them do something like the bamboo school in their school. So we wrote a proposal and got money. We gathered about 200 schools and formed a Partnership School Project. In helping rural schools to become gateways to improve the quality of life and income in surrounding Villages. Here is caring for the elderly who have no relatives. We have a farm for them now, income. Some of them are lonely. So, villagers brainstorm ideas on what they want to do to help the elderly people. Then, the students go and suggest ideas and they start doing it with training. The elderly people come to our school for training and then they implement income. Here, they are visiting our school and we believe a school should be a clubhouse for elderly people. There's no reason why we should not do that because elderly people are happy to be with young students. We train the elderly people for the loan fund for them to grow vegetables. Here is a vegetable farm by the elderly.

And then the Prime Minister supported the Partnership School Project. Here is at the meeting to ask the school to be lifelong learning centers for all. and for the schools to be hubs of social and economic advancement in the surrounding community. Activities of the project are to improve the quality of education, to improve the quality of life and income, health, environment, community empowerment and participation in the school, to give a greater role to students in school activities and in the village, and then, democracy and anti-corruption. Here is the result. Here is the signature of the people of the Ministry of Education, making sure that the province of Chiang Rai covered every school, 530 schools. So, anything you want to do, we believe you can go through the school, to the community. Education, agricultural skills, business, loan fund, empowerment. All, everything you want to do. So, I think we should see the school must be a hub for social and economic advancement. Any Ministry who wants to do anything, go through to the school and you will have a very, very good system.

Here is the Prime Minister being briefed by students of their melon farm. Grade 3 students are growing melons. and here, melons are grown by primary school students. They're learning new techniques, growing in containers where the soil is bad. Young children also have baskets, mushroom. And even kindergarten kids are growing mushrooms. Student businesses - vegetables growing, mushroom businesses, pineapple cakes. Expansion of activities into the community. They borrow money. We have a loan fund for the community and so they've expanded their activities going on in the school until the elderly. There are the vegetable plots all from the loan from the school. So here's the mushrooms. Here is the partnership between the elderly and the students. And here's the vegetable farm at the elderly's homes. So all of the school now is helping the elderly.

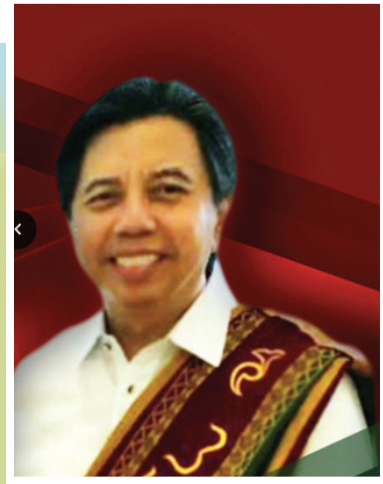
Why we say that school is the good place for Gateway is because most of Thailand's 32,000 schools have buildings, land, electricity, water, teachers, parents, students - but all are under-utilized. Villagers have a strong bond with the school. There are more schools than any other

government offices, and are surrounded by 76,000 villages. The United Nations Population Fund (UNFPA) stated that, “The Bamboo School is one of the most innovative schools.” These are the many reasons that they gave. We use Sustainable Development Goals, and teach them in school. We believe that 17 is not enough. We’ve added 4 more. (1) Empathy and Sharing, (2) Rule of law and Democracy, (3) Honesty and no corruption, and (4) Family Planning, family security. Here is the signing of the student pact with the UN, getting 16 schools, and the students to sign, not the director of the school. So, that’s the last slide and I believe I stopped just at the right time. So, thank you for inviting me to join you. I hope this is some material.

Thank you.

KEYNOTE ADDRESS 2

Professor Dr. Alex Bello Brillantes, Jr.



Sustainable Development and Good Governance in Designing for Transformation in the Global South

I'm very privileged to be a part of this forum. And I'm very honored to share the floor with Dr. Meechai. I always admire you, Dr. Meechai. You really are a citizen of the world. And I'm so grateful that I've had this opportunity to see you again. I actually listened to your presentation some time back in Thailand with Dr. Sida Sonsri. It's always so inspiring to see you, Dr. Meechai. Thank you for inspiring us, really. I will make a presentation very quickly on the notion of Sustainable Development and Designing for Transformation in the Global South.

I'm very grateful to the President, to our Dean, and to Professor Sida Sonsri for the privilege to be part of this very important forum. Dr. Meechai, you talked about the Philippines and Thailand, it's so nice to listen to that. Sometimes at one point we were twins, but we all know what happened. I guess we should continue learning from you and hopefully we'll be able to continue learning from you.

So beginning with the Vision of Kasetsart University, I was listening to a very nice presentation earlier. We talked about three things: academic wisdom, ethical and moral excellence. Something emphasized by Professor Meechai, very important. Ethical and moral excellence. And we talked about the need to be a leading university in sustainable development. And I must congratulate the university for this very important forum. Also listening to the presentation earlier in the video, it's all about the public service. Developing public service mindset, learning to move from theories to practice and sustainably develop our society. That is precisely what sustainable development is all about, and good governance, my topic for today. At the end of the day, it's changing mindsets. I really love how Professor Meechai talked about the importance of changing mindsets. My students in the universities in the Philippines are also talking about the importance of changing mindsets. Something that I will discuss later on.

I will be discussing the context of social sciences and public administration. Public administration is also one of the social sciences. Focusing on E, i.e. Equity. With public administration, you can be good managers, economic, efficient, and effective. But, at the end of the day, sustainable development is very important. More importantly, intergenerational equity.

Working with the young people. The Bamboo school is one of the best examples of really focusing on really working with the next generation. Somebody once said, “You know, our generation might have failed you, but you don't have to work with the next generation.” I will give you a background on what is sustainable development and some practices of sustainable development and transforming for good governance.

Public administration is one of the social sciences. It is simply multidisciplinary. In your university, public administration and political science are together. But we all know that public administration is multidisciplinary. It’s not only Government. It includes elements of political science, sociology, economics, history and culture, law and others. It is multidisciplinary towards the ultimate objective of participating in improving society and, quoting Dr. Meechai, making us good citizens. I keep on telling my students that when we are in public administration, you are not just getting your degree. We are in public administration because we have to be better citizens. And that is what public administration is all about. We have to be better citizens. I think that's very, very important.

This is a very quick paradigm in the Global Encyclopedia of Public Administration. We try to deconstruct the notion of Public Administration. Public and Administration. “Administration” - all about management, economy, efficiency, managerialism and how to become good managers. I will focus mostly on “Public”. Public Administration, in “Public”, we are talking about for whom we are governing. It's very important to know why we are where we are. And with the two things that we talked about, the importance of equity, i.e. we’re talking about the poor, the vulnerable. But equally important, we’re talking about intergenerational equity. And of course the last ‘E’ would be Ethics and Accountability, which I am very happy, Dr. Mechai. You talked about the importance of ethics and accountability. So we talked about 5Es - Economy, Efficiency, Effectiveness. That's fine. But most importantly, we have to talk about Equity. Equity for the poor, Equity for the next generation. And equally important, Ethics and Accountability.

I’m sure many of you have seen this paradigm. At the end of the day, it's really making sure everyone gets the support that they need. We are not created equal. I think that's one part of them that you should challenge. We are not created equal. It is very important to focus on the Next Generation, our children. I have three grandchildren and sometimes I worry about the times we’re leaving our children. I really worry about that. I studied in the US for about 6 years, I've never seen so many homeless people. There's so many homeless people in the US. and it’s supposed to be the richest society in the world. The Philippines, of course, we have our own now. Inequality between the rich people and the poor people, as this picture shows it. Equity continues until today, including digital inequity, digital divide. You look at this, one school with all the students with their laptops, but in another school you have students up there on the roof of a building looking for the signal. We’re talking about inequity. We’re talking about the digital divide.

Question: For whom is Public Administration? For whom is governance? That is what SDGs are all about. I must mention this notion about equity, working with the poor was set by our President Magsaysay. Ramon Magsaysay, President of the Philippines, in 1957 already said, "Those who have less in life should have more in law." This was mentioned a long long time ago. It lies in the ideology when you talk about governance and public administration. We talked about, quote and quote, the poor and the vulnerable. But there is another dimension of equity. It is about intergenerational equity.

Some of you might have heard this very young Greta Thunberg talked about how our generation, the older generation, might have failed you. All you talked about was trade laws, but you should talk about mass extinction. We are about to die. We have this existential threat. Question: what are we leaving for the next generation? Who for whom? I think equity is also taking care of the next generation, which is what sustainable development is all about.

In the Philippines, there's a prominent lawyer, Antonio Oposa. He talked about intergenerational equity. Succeeding generations who are not yet born have a right at this point in time, because we are borrowing from them. We are borrowing from them and it's very important that we take care of what we leave them. And we should not fail them. There is a Nobel prize winner. Her name is Maria Ressa and she said, "We might have failed the next generation." She was the first Nobel prize winner from the Philippines and I really admire her. She talked about how our generation might have failed the next generation, and we should not do that.

So, it's about equity. It's for the vulnerable. It's for the next generation. That is what sustainable development is all about today. And our topic for today is sustainable development and good governance and its transformation. When we talk about designing transformation, what we have today is unacceptable. Later on, I will talk about how it is important to change laws, but equally important to change our mindsets. Equally important, we need leaders. Great leaders who will inspire the importance of seeing the importance of citizens in government. We cannot govern without the people involved. And that it is in the paradigm discussed earlier.

This notion of sustainable development is not new. It has been here since 1972. The Brundtland Report talked about sustainable development is development that meets the needs of the present without compromising the ability of the future. So they talked about the future, but this was in 1972, but you know what is different. Limits to Growth, this is one of my favorite books by the Club of Rome. They talked about the limits to growth. This was 50 years ago, they were already talking about that. Unless growth was rapidly contained, most natural resources would disappear over the next century. The Club of Rome, they were already warning about that, in 1972. And what has happened? It has become, as a matter of fact, worse. In 1972, we already talked about existential threats. 1972. Club of Rome. More than 50 years later, Noam Chomsky,

talked about the possible Extinction of humanity. We're not talking about existential threats. This includes extreme weather, climate action, and human infectious diseases. We're talking now about existential threats to humanity even as we speak. So, I am worried about the future of our children and our grandchildren.

We have heard about the term VUCA, and it is an old word already. But it is still relevant. The concept of being volatile, uncertain, complex and ambiguous. Where our children are living today. And the UN itself, Maurice F. Strong, UNCED Secretary General, once said, "Every bit of evidence I've seen persuades me we are on a course leading to a tragedy. I don't agree with those who say the status quo is the answer." Something has got to be done. And of course that is what the SDGs is all about.

This is a quick review of the so-called First Revolution, Second Revolution, Third Revolution towards the SDGs. The first one is the invention of sustainable development. The second was multilateralism. We cannot live alone. It's very important that we are living in a globalized environment. We talked about glocalization. Think global, act local. Corporate multilateralism. The third is the context of CSR - Corporate Social Responsibility within the context of sustainable development.

Just a background of sustainable development. Like I said in 1972, it was there already with the restructuring of the new world order. I have this book in my home office - Our Common Future. Not only Thailand, not only the Philippines. We are here. We are on spaceship earth. It defined sustainable development as an inseparable link between poverty, inequality and environmental degradation. My own background is development studies. At one point, we kept talking about development. Then, I said, you know what, not only development, we have unequal development. We have inequitable development. We have underdevelopment. Question: Are we contributing to underdevelopment? That is the question we should ask. That is one thing that is emphasized in the Vision of the University. The Brundtland Report in 1987 explored the causes of environmental degradation, interconnections between social equity, economic growth and environmental problems.

The Second Revolution, as they said, it's the reinvention of multilateralism. We, as a globe, the global community has to come together. We are not an island. That's what Noam Chomsky has mentioned. International cooperation is very important in the field of sustainable development. We talk about climate change. We talked about pollution. We all know that it cuts across national and international boundaries. There's this call to return to multilateralism and the Kyoto Protocol. 1992 with the United Nations Conference on Environment and Development. Point of reference, the United Nations have always addressed this as a particular concern, because things cannot be the way they were before. We have to do something about that. This is what Al Gore also talked about.

Al Gore came to the Philippines once, and talked about the Inconvenient Truth, and it was great. I really liked it. He also received a Nobel for that inconvenient truth. We are all connected. That's what Maurice Strong always said. So the 1992 UN Conference on Environment and Development in Rio concluded with 105 nations gathered to demonstrate their commitment to sustainable development.

Leadership and political will is also very, very important. Commitment of political leaders. So, 1992 came up with Agenda 21, and, of course, talked about the importance of global partnership to encourage cooperation among nations as they support sustainable development. We encourage the local government to come up with Local Agenda 21 plans. The Global Agenda 21 has to be localized. Remember this whole notion of 'glocalization'. Think global, act local. The broadest public participation and active involvement of NGOs and other groups are encouraged. We cannot leave the notion of sustainable development to governments alone. We are citizens, in fact, who might be angry. We might be citizens who are bothered by something. It is ok to get angry, but we should provide alternatives. That's why today we are brought together by Kasetsart University.

The Third Revolution is the involvement of the citizens, involvement of business. It does not simply call out to governments, but citizens groups, to non-governmental organizations, and, underscore, to educational institutions. We're, the universities, all part of this. But we cannot live in the comfort of our classrooms. We have to get involved. And indeed in the earlier video that you showed us about social sciences, you talk about the importance of theory and practice. I think that's one of the things the video of the faculty of social science mentioned - the importance of the role of education. The point is, educational institutions have to get involved. We cannot, we must not remain in our ivory towers. We must bring theory to practice. And that's what Corporate Social Responsibility is all about.

John Elkington talked about the Triple Bottom Line: People, Planet and Profit. It's okay to have profit, but a bit of a company to contribute to the economic development, obviously for the ecosystem. The ability of the company to continue the current development of the ecosystem. 2000. After Agenda 21 came MDGs. 15 years, they said. With the deadline of 2015 to reduce poverty. So the UN and different international agencies have all come together addressing this notion of sustainable development that has bothered us since 1972. We should do something and many, many, many international commitments, many protocols etc. including in 2000 we have the Millenium Development Goals. There were 8. Eradicating poverty, achieving universal education, promoting gender equality, maternal health, combating HIV/AIDS, ensuring environmental sustainability, global partnership. Of course, we all know that by 2015, it has not been that successful. They once said, "The job is unfinished for millions of people - we need to go the last mile on ending hunger, achieving full gender equality, improving health services and getting every child into school.

Hence, we now shift the world onto a sustainable path." which was what UNDP had mentioned at the time.

After the MDGs, now we have SDGs. In 2015, we now came up with the 2030 Agenda for Sustainable Development in 2015, a shared blueprint for peace and prosperity for people and the planet. Remember the Triple Ps? It is the urgent call for all countries - developed and developing. The point is, global partnership is very important towards attainment of 17 SDGs. What I am doing now is looking at the whole course of sustainable development as far as 2015. From 1987, 1992, and now, 2000, and 2015. We are a global community. We are bothered by what's going on. Accept that we have to do something, otherwise, otherwise. We cannot leave this kind of environment to our children. And people have been saying we might be moving towards a mass extinction. That is what Noam Chomsky and even Greta Thunberg mentioned. Status quo is unacceptable. SDGs, that is something very positive. Talking about 2030 Agenda for sustainable development adopted by the UN member states in 2015, seven years ago.

I'm in EROPA - Eastern Regional Organization for Public Administration, and also AAPA - Asian Association of Public Administration. We have been invited to attend the Committee of the experts for public service and part of what they do is they also look at how countries have attained SDGs. You have to go to the Voluntary National Sector Review (VNR). Many countries have gone there to see how far we have come in terms of achieving SDGs since they were established in 2015. There's this type of monitoring critical look at where we are. Because at the end of the day, they recognized that ending poverty and other deprivations must go hand-in-hand with improving health, education, reducing inequality and spur economic development. These are parts of the SDGs. that continue to be monitored by the United Nations, and also the UNSEPA (United Nations Experts for Public Administration). EROPA also had been invited to these meetings, including UNPAN (United Nations Public Administration Network). I'm very privileged that EROPA is a part of this important forum today.

We have mentioned SDGs, and I really want to add the four additional goals mentioned by Dr. Meechai. I would like to emphasize, since we are in Public Administration, number 16: Peace, Justice and Strong Institution. One of my favorite books is 'Why Nations Fail'. Acemoglu and Robinson talk about how nations fail because of weak institutions. That is very important. SDGs talk about the importance of building strong institutions.

Point of reference. If you look at Evolution, if you may have been thinking of sdgs, we have looked at global efforts led by the United Nations and other international agencies. Now, how are all these implemented? How did these found their roots in different countries? We talked about glocalization. From theories to practice. Globalization is glocalization. Thinking global, but acting local. So on the next slide, I will talk about the good and best practices of sustainable development.

Beginning of course with the work of Dr. Meechai, which all of us in the world are so very grateful for. Certainly we learn from you. This is the UN Office on South-South Cooperation (UNOSSC), which is based in Bangkok. The point is, they also emphasized the need for cooperation, multilateralism. They talked about bilateralism and including triangular cooperation. You can download this, by the way. The point is there are many good and best practices. Yes, what we have today is unacceptable. Yes, we are disturbed. There are things that could make us more hopeful, including the presentation of Dr. Meechai, including those that we are talking about today.

Scholarships in Southeast Asia. This is an important point when they talk about Sustainable Development for ASEAN Students from Cambodia, Lao PDR, within the context of STEM - Science, Technology, Engineering and Mathematics. That is SDG Number 4, education. The program aims to share STI knowledge through a degree program with CLM and ASEAN member states. ASEAN cooperates with each other and this is one example. This is giving us a particular example of how these SDGs and sustainable development discourse have been implemented by different countries. Of course, we are familiar with ASEAN Smart Cities Network. By 2030, an additional 90 million people are expected to move to urban areas. ASEAN Smart Cities and even Smart Farms are part of SDG 9 and 17. Thailand-Lao PDR South-South Cooperation; South-South and Triangular Cooperation to strengthen Pakistani compensation system for workplace injury, based on lessons learned from Malaysia and Thailand. I'm just taking examples from the UN South-South Cooperation Office. This is an example from Nigeria, the importance of capacity building. Afghanistan-Indonesia-Germany triangular cooperation for women's economic empowerment; the use of vaccine technology cooperation in India and Indonesia; Rice-fish farming in Myanmar.

And the examples in the Philippines. From 1952 with the Philippines Rural Reconstruction Movement, to Philippine Council for sustainable development all the way down to our Ambisyan Natin, or Vision 2040. Plans and institutions have been set up. Just some examples - the creation of fish sanctuary and marine reserve area, the Philippine cockatoo perseveration program. This is an example of how the program transfers bird poachers into wardens. It's changing the mindset of the people. And South Cotabato - mines. People talk about responsible mining. The tribal leaders themselves who were involved in mining. Tagbilaran city, they talked about the importance of having frameworks and management plans, which include solid waste management, coastal and water resource management, and air quality and traffic. All within the context of sustainable development. At the end of the day, local governments as frontliners play a very important role in transforming this broad goal of sustainable development into the real world. We talk about the importance of localization.

This is Ilocos Norte, in the Philippines, where we talk about earth dams, water reservoirs and irrigation systems to maximize water resources. And here in Leyte, there is a community-based ecotourism and coastal resource management. Part of this is we also need to recognize and reaffirm good practices. The UN has a program called UN Public Service Award to recognize good and best practices. And I know a number of Thai winners there.

Issues and challenges in the Philippines - lack of resources, failure in implementation, political will and leadership, citizen engagement and communication. So, how do we incorporate the teaching of SDGs into the curriculum of HEIs? EROPA is working with the UN in teaching SDGs in the curriculum. That includes changing mindsets, leadership, citizen engagement, towards the organization of partnership between the town and the university. It's very important that we, universities, we, the higher education institutions, should be involved. Otherwise, we will simply remain outdated in an ivory tower with a nice PhD dissertation, but didn't really learn.

Last part, the framework of public sector reform. We did the context of SDGs and governance. And when you talk about governance, you talk about bringing about reform. With reform, we talk about changing structure and institutions. New decrees, Public Act. But more importantly, mindsets. We need to change mindsets, and equally important, leadership. We need good leaders and citizen engagement. This is my friend. Her name is Adriana Alberti. She speaks about doing that, especially changing the mindset. She talked about an iceberg. We can change structures, but what is more important is really changing the public servants mindsets. Kasetsart University, you talk clearly of how you want to create a public service mindset. We talk about changing the role of schools. Our role as educational institutions toward attaining the SDGs. So the role of schools in promoting mindsets of the implementation of the SDGs. Part of our job is changing mindsets, because at the end of the day the public service mindset is the one that gets in the way.

Closing notes. Going back to our theme "Sustainable Development and Good Governance in Designing for Transformation in the Global South ", we discussed the history of sustainable development since the 70s, limits to growth, existential threats, and the three revolutions. The whole idea of sustainable development has been nicely designed but unfortunately has yet to be implemented. And that's where we are today. And hopefully we are moving in that direction. The importance of glocalizing the SDGs, and the good and best practices in ASEAN and the Philippines.

We talked about the role of social science and public administration. Public Administration: the 5Es and A. and President Wacharinrat talked about VUCA, and i suggest we can also head to the new VUCA - from Volatile to Vision; from Uncertainty to Understanding; from Complexity to Clarity; and from Ambiguity to Agility. With that, I would like to thank you for this opportunity.

Thank you very much.

KEYNOTE ADDRESS 3

Philippe M.F. Peycam

Sustaining Transformative Developments through Academic Inter-Regional Collaboration: the Role of IIAS

Thank you very much and I'm very honored to be invited to this conference. As the speaker just mentioned, my institute is very happy to work with KU. And we're very pleased with what we have been able to accomplish, even in the context of the Covid, with our colleagues from the Social Science Faculty, with the establishment of Kasetsart University's Africa-Asia Program. So, that gives me a good entry point to try to share with you some thoughts that we are having here in IIAS in Leiden, in the way we are reframing or continuing to shape the position of our Institute. In that, it contributes specifically as a social science and humanities institute to affect sustainable transformation in the global South, which connects with the topic of today's conference. I wanted to reflect on some of the terms like sustainability. Or what do we mean by sustainability? Are we limiting ourselves to economic sustainability and environmental sustainability as we just have now? Political, societal etc. I think, in our sense, there is a need to really think in a holistic approach, because everything is obviously connected.

The other notion that needs to be always talked a bit about is the notion of the Global South. I mean, what is the Global South? We know that there are elements of the Global South and the Global North. What does this expression mean? Now, this is the trendy new expression and the issue here is to try it for us to move away from the formative, often ideologically loaded definitions to explore a really real true mode of emancipation. and I think that's what we understand with the notion of sustainability in the Global South. So, my way to see this would be empowering or giving capacity for societies to really develop their working model within the highly entangled world that we are living in. We are all very much interconnected nowadays, but we should be able to situate our efforts to build what we call sustainable development in relation to our own social environment, ecological constraints and also opportunities.

I just wanted to make two counterpoints that I think cannot be eluded in the current time we are living. First, we cannot escape from the fact that there is the beginning of a new world configuration. With US-China new kind of cold war and wealth construction with areas of influence that are increasingly shifting themselves. One against each other. And I think in relation to this

development, something interesting is the clear desire from many countries from the South - especially from places like South East Asia, South Asia to some extent, Latin America, Central Africa - not to be drawn in the geopolitical agendas that are determined in the North. And even the North knows that includes not just the traditional West like North America or Europe, but also China and Japan to some extent. So this new configuration obviously is affecting what we call the Global South. And we need to think in terms of how we, from our own position, are affected by this sense of separation or division of the world. Nonetheless, it has an impact even if we try to keep away from it.

The other counterpoint I wanted to make is there is a growing trend of restrictions of academic and intellectual freedoms in most regions. Of course, notably in the Global South, for instance, Southeast Asia and South Asia. We see a trend towards the restriction of the capacity for academics for the social sciences to really operate openly and freely and to exchange and therefore have an impact on the society. And these restrictions obviously are hampering capacity to really affect this notion of sustainability. This is also true in the Global North. There is the rise of two trends within a Western or Northern societies. There are Trump-like politicians who don't necessarily value the notion of intellectual freedom and democracy in the way of doing politics. But also, there is a reaction to it, against it, which tends to be very technocratic and centralized decision making. I'm thinking in particular about the European Union, for instance, as a structure that is not elected, really, and that becomes increasingly pervasive in any aspect of a decision making and; therefore, also becomes an important obstacle sometimes for inventing, as far as social science is concerned for inventing new ways of impacting and producing social sustainability.

So, I think these two current developments, I would say a mega development, make us as social science people think about how to take a clear stand. We need to take a stand just for the basic reason of existing as social scientists and this means our political stand. For me, ‘politics’, not as a kind of an ideological, political, in a party politics sense, but more in a civic sense that means really acting in society, in the police in the city. ‘Political’ comes from the word ‘Police’ in Greek and that has a fitting implication especially for academics who do research or teach in the social sciences to think somehow beyond their individual research project or teaching tasks. To think about the civic role of their work and how did this role connect to the organizational sense of social science. That means to think critically of the importance of institutions, especially this is a good opportunity here because we are with the university that is very well known in the field of agriculture and environment. The role of the university, the civil role of the university. I think it's right in the case of KU to have this Faculty of Social Sciences. I hope that the leadership of the university will value the role of this faculty within the university to help imagine in a civic and meaningful fashion the role of the university. In this case, a university that has a specific focus on forestry, agriculture etc.

I would also connect to academic civic organizations beyond the University's institutes, centers, and sometimes think tanks etc.

When we talk about social science, to be a bit more specific and to see that it's not just social science as an open intellectual sphere of debate, but it is also very much a form of civic engagement and, thereby, the importance of institutions that host them that give them the possibility to operate. Having said that, my talk was very much willing to share with you the thinking we, me and my colleagues, are having in refining and defining the role of my institute - the Institute of International for Asian studies - as a kind of a case study, as an example to think about the social sciences. So I could just say that IIAS is called the International Institute for Asian Studies which was the title itself is a bit problematic. It's international and it focuses on Asian studies. So, what does that mean? It's located in the North, the Global North, in a northern European country. It is rooted in a humanistic social science tradition and I would also say it is a public service institute. We are funded by the Ministry of Education. And even though we are located within the University of Leiden, we are mandated autonomous. What is a mandate and to what extent it connects to the discussion we're having today? IIAS was created in the 1990s just after the end of the Cold War. So it's a supposed Cold War institute. I would say there was an effort from the beginning to think of this institute as not so much an area studies institute, even though we are called Asian studies. And I think it has to do with the fact that we needed to get funding from the government; so, we wanted to originally raise the importance of the Asia factor in the world as a global trend. But the idea was not really to define IIAS as a small structure, as a repository of experts on Asia. I think the Netherlands has a lot of people working on and with Asia already, but rather as a facilitation structure with an open mandate. And that's why we are also called the International Institute. It's a bit vague somehow, but the great thing is that from the beginning of IIAS, its raison d'etre has been forced to operate as an inclusive collaborative platform, working especially with colleagues and institutions in Asia. With colleagues and institutes in Asia. I really stressed the 'with', not 'on' Asia. And especially Global South Asia, like South East Asia or South Asia, Central Asia and in the global context. We don't want to be limited to a geographic construct since this very geography construct is itself globally connected and present everywhere. A few years ago we had our last big in-person conference which was held in Leiden for once. It was titled Asia and Europe - Asia IN Europe. So, we can say that Europe is also Asian, or Asia is also European. So, to take stock of the fact that the boundaries are very porous and we cannot really define knowledge production in very strict geographic terms. That's why I would say that IIAS we are a bit of a post area studies institute in that sense.

So, what makes it a very interesting model of an institution? Up until now, we receive support and we have been always encouraged by our donors, mostly by the Ministry of Education here, to have this open agenda, this capacity to always transform, refine itself to be able to address new challenges as we see them emerging. That has enabled us especially to develop a model which I would call a multi-functional model. A holistic approach which is rooted in this civic dimension that I stressed earlier. Because if you really want to have an impact in terms of sustainability for instance, as a social science institution, you cannot just limit yourself to very strictly defined areas of interventions. So that maybe the second point I want to make for this presentation is how IIAS does what it does in terms of its multi-functionality.

So, we've identified, I would say, five functions in which IIAS is engaged as a facilitating institution. The first has to do with knowledge production and the facilitation of research. That's quite classic and I would go into details about that in a moment, but it's obviously a critical aspect of the role of a social science institution. The other one is knowledge transmission and I would associate that to the facilitation of educational undertakings when it comes to Asia knowledge on, with Asia in the world. The third function that I see very important that IIAS has taken on for quite a long time is the function of knowledge dissemination and in that I mean publicization to really spread and to render accessible knowledge. It's not just Publications. I will explain. I will go into details. But it's really to make academic knowledge accessible across the social board. Another function which is very critical is knowledge network and community building development. That's the key role of IIAS and many of the programs we are developing are always rooted in networks and their foreign collaborative networks between partners. Finally, the last function which may summarize the others is this notion of civic engagement, which I would translate in this idea of institution-building, supporting, helping institution developments for us and for our partners and with our partners. So, basically IIAS is a function-based participatory facilitator which works completely on a basis of collaboration. We never do things on our own. We always do things with partners on equal footing. In that sense, as I stressed earlier, we are really not a research center made up of experts as I stressed earlier.

So now, I'd like to describe some of these functions and what we are trying to do under these functional themes that I've just lined up. I want us to do obviously the first one with research facilitation. I would say that is the most conventional, the most classical one. From the beginning, IIAS has been operating as an international fellowship program. Originally a postdoctoral program. Originally, the module was very traditional. Twice a year, we do an international call and people who have completed their PhD or even people in the middle part of their career can apply to spend up to one year at IIAS to complete their book or write a number of articles etc. So that's very classic. And now recently, this is something that we have decided to, a program that we decide to

revamp. That's why I thought it would be interesting to share this with you because it very much connects with the subject of the conference itself, which is how to really foster research without falling in trap or limited by restrictive definition of what research should be and how people should be selected on this criteria. That's a very complex question. We have tried for many, many years to really diversify and reach out to scholars from the South in particular. I think we've done a fairly good job but the terms of criteria of selection and of evaluation of the research have been always restricted to the normative model of economic model defined in the North. We talked about excellency, the competition and what is very much should be the criteria that are usually valued. All quantifiable criteria in terms of publications, university pedigree the candidate can present etc. Very text-based and very traditional I would say. Now, we realized that continuing to do that even with the effort to encourage people across the board, especially in the South, will reach a glass ceiling. We would never manage, let's be honest, to get potentially very good people from places like Indonesia, Thailand or Africa, unless they have gone through some forms of mechanism of recognition by a Northern institutional structure. It can be a university programme. It can be a publication in a first-tier, usually US-based, English language publication etc. So, in doing that, we know that we are missing so many people and that we don't do our job fully, when it comes to being truly inclusive and so now we are in the process. We just hired somebody from the south who will help us to redefine the model of the fellowship. First of all, the fellowship selection process, but also of the way we want to help fellows. That means being much more open, being much more inclusive of different forms of academic or intellectual contributions or itineraries, experiences, and forms of expression. So not just limited to the traditional articles and books only. It can be artistic production. It can be experience in some organizations etc. To develop this new model of an inclusion for a fellowship program and therefore for the facilitation of what we call research. We will develop some instruments like a two-level system of selection like a much more proactive, interactive work with the candidates to help them develop their own itinerary. I would say that because the topic is very much about the Global South, as I said before there are Global South in the North, as well. We've increasingly seen people from the North sometimes coming from very very prestigious institutions who can’t find jobs so in many ways there is now a sense of precarity among the social sciences and humanities. We felt increasingly that our fellowship program has become more of a kind of antechamber for another fellowship somewhere for people who may not find jobs. So we also are mindful of this reality and we feel that. That's also true for what we call the people coming from the south is that we need to be more sensitive to how people can shape their own personal itinerary as academic but sometimes also not just academic, in society. And how this fellowship program can really help that. And of course in doing that we want them to also contribute to elaborate new forms of knowledge production that may have a more impact beyond

the traditional limited circuit of an academic publication, production. That's just an example where I think we are really trying to revamp. And we think about our impact as a social science organization in terms of building sustainability, especially in the South.

Another function that I mentioned is education. I mean all the points that I make are all connected in some ways. but some in education we have developed for a few years now - education facilitation. We are not delivering degrees. We are not even a university. We are just again a facilitator. But we have developed a number of initiatives, but eventually they all crystallized into a major program, for which we have received successive grants, notably from the Mellon foundation in the US for a program called, 'Humanities across borders.' It's a very ambitious initiative for which we were encouraged to think creatively by the foundation which basically means to propose an alternative humanistic situated pedagogy which is built on experiential learning. And that means that we won't recognize different forms of knowledge within society and also beyond that to move education beyond the classroom. I'm trying to. We're doing it practically. After having constituted a rich network of universities or partners. Each in their own contexts have been very creative in developing modes of social educational engagement with and in relation to their communities. As a way to also enrich their own education and to give their education more meaning, more social ecological meaning. We have about 20 institutions in Latin America, North America, Europe, Africa and Asia.

Since we are in Thailand, we are truly in this conference. Our key partner in Thailand is Chiang Mai University. Chiang Mai University has a long tradition of very much developing its programs also in relation to the social human environmental ecosystem that surrounds the city and the University of Chiang Mai. And that transcends even boundaries because CMU works also with Partners in Myanmar, Yunnan in China, but also in Cambodia and Laos, Vietnam. For many years, they have been very advanced in developing courses. They have a vice president for social engagement and they have developed their own self evaluation model beyond the national evaluation that includes the social engagement dimension. So, they are one of our key partners as I mentioned. We found a lot of interesting partners. Usually the result is often the result of individual initiatives that I'm not always well recognized, usually they are recognized by their institutions but it depends. In Chiang Mai, they are. In so many institutions, they are less so. And they are not necessarily appreciated at the national level. A way also for us to develop this program which involves many different players within academia and outside has been to identify themes that transcend disciplinaries. Even sectorial structurations.

So, we have identified four themes of universal meaning. Food is one. Space is another one. Language and story making is another one. And crafts and making is the fourth one. We could have included others but we didn't. Around these themes, we've developed a number of curriculum

development elements syllabus that eventually we hope to shape and frame into a place to develop a methodological skeleton for an alternative pedagogical model. This program is very important for us and it has helped us to really refine and define our own civis position as an institute itself. It's always an ongoing exercise and it's very exciting. I don't want to go into too much detail here but you can look at our website ' Humanities across borders', you will find a lot of information about that. And again, this is very much, sorry I forgot to mention, this is very much rooted in the Global South reality because we found out in the elaboration of this program that often in less formalized structured environments, you have more space for creating interesting pedagogical models. So, we always tend to think, especially in the South, that the model for pedagogical intervention should come from let's say the US or Europe or Japan but in fact they are often more creative, innovative initiatives within our own region in the South than they are in the North. The North actually is very much often and entrapped by the weight of a normative model is very difficult to change. So it should be in that sense to reverse the hierarchy in terms of dynamism and a learning process because most innovative projects come from the South. Some partners from the North are very eager to learn from experience in the South.

I will give you an example from just last month in the United States. One of our partners is Kenyon College which is a liberal arts college which has an interesting profile because it's a very elite college but it is surrounded by an environment with a lot of impoverished people who tend to vote for Trump. So, they are very much now forced to rethink their position and their role within the context that is social, regional context and for that they are looking at examples like Chiang Mai, like Ambedkar University in India, or a number of education programs in Mexico, for instance. So, I've been quite extensive on this topic but this is where IIAS think we can play a role in facilitation.

Another function that I mentioned earlier is that of publicization. Again, to reach out across different spectrums in society. For that, we have a range of programs from a podcast program, some publications in English, book prizes. We hope for more translation into different languages. English is not the only language that is the legitimate language of knowledge. A program of book reviews. This is around one core initiative which is the IIAS newsletter. So this is a program that has been running since the foundation of IIAS and which has evolved into a kind of a periodical which is not a peer review publication. So, it's much easier to contribute a short piece in it, which is free, which is either accessible in print or online and which is widely circulated and can be used for multiple purposes. The IIAS newsletter is, I think, I don't want to boast, but it is really what everybody who works on Asia, with Asia, usually at some point comes across the newsletter. We have about 70,000 subscribers. It's free of charge. So if you are interested, you can. The newsletter includes contributions from different partners. It's not the IIAS initiative alone. For instance, we have a partnership in Southeast Asia with the Institute of Southeast Asian studies in Singapore

and they are responsible for collecting material across the region. To display the work beyond the small circle of scholars in Southeast Asia itself. This effort to find new modes of reaching out and connecting people who are not necessarily limited to the academic sphere is also an important potential contribution of the social sciences to social sustainability.

Another function that I mentioned is about community building and network development. This is really important because as I mentioned earlier, everything that IIAS does is very much collaborative. We do that through a number of networks that we've helped set up or we have joined. The most famous one is the International Convention for Asia Scholars, which is the largest network on Asia-related topics. And we are trying to transform from within this conference model. From being a traditional panel, a region-specific mode of discussion into a more cross-disciplinary, transdisciplinary, cross-regional discussion around a number of themes. We've made a lot of leeways already on that. We have also moved towards embedding the conference into the host city, into the social landscape in which we organize this event. So these are not really the conference that we are used to in which people are congregating into one building and in disconnection from the rest of the place in which they are meeting. So, we have been, of course, hampered by COVID but we want to restart the process and along this line we've helped establish the Africa-Asia platform. Long has been an ICAS line, every three years they organize a major conference in Africa and that's very important because again in this case it's as much about field building as community building. It is really shaping a new special access of knowledge, that's the title put forward by our colleagues from Africa and alternative access of knowledge which is not defined from the North. In this case, which is a South-South space, in which topics are discussed on the basis of agendas by our friend, not by the North. Again, this event was organized around about 10-12 themes - migration, history, knowledge production etc. And around these broad themes, people will really come out with their own experience from both Africa and Asia, plus from people who are interested from outside these two regions. This has been a very interesting development in which we have not only contributed to develop new networks but we are helping shape a new community which itself is forging a new space of knowledge production.

There are many other examples. I will just want to stress this last point which goes with the final point I have, in terms of the functions of IIAS. It is how we are always trying to ensure that we are inclusive of multiple stakeholders. So, we are not just talking among scholars, but we want to include NGO leaders, governments, and members. It can be business leaders. It can be journalists, civic actors, educational actors, and artists, of course. We really want to provide space for these different groups of people. It's not easy, but each time we are refining the model. And we hope the next two events, the next Africa-Asia event, which I can say now will take place in Senegal, in Saint-Louis in November 2023. And in 2024, the next ICAS event, which will take place in Asia.

I cannot yet tell you where because we are in the discussion. We hope to really go deeper into these efforts to embed ourselves in society with multiple players and stakeholders. All knowledge productors.

I would finally point out the civic engagement role function of IIAS. That's quite easy because it connects to the beginning of this conference to state that many of the initiatives that I have listed are meant to really find an academic institutional translation, incarnation, I would say. We've helped some colleagues in Ghana and I think they are participants of this conference, University of Ghana, to establish their Center for Asian studies. There's a very dynamic director there. There was no Center for Asian studies in Africa. That was an African Institute. And that's the result of a lot of effort. Coming out of a conference in 2015 in Ghana on Africa-Asia. The first of the series that I mentioned earlier. And at which time the University of Ghana itself decided to establish its own Center for Asian studies. So, not depending on experts from the West, or of the North about Asia, but all to be dependent on some Asian partners, who may have a very strong will to develop the project. Maybe in a kind of a bilateral way. I'm talking especially about China in the context of Africa. That's a very important step.

I would mention the Center for Community Knowledge in Ambedkar University in Delhi. IIAS was not responsible for the creation of the center. It was there. It's a very unique initiative that has been operating with a group of people to really connect the university with the different communities around it. That's why it's called the Center for Community knowledge. Ambedkar University was founded by the City Government of Delhi, so there is a sense of embedding the university within the social fabric of the city. But we have worked very much with them and the program HAB for instance has been very very helpful to the CCK. Likewise, we helped them when they wanted to develop their first museum of the people of Delhi. That's another example. I don't want to go into the research center for Social Development or CSD in Chiang Mai University. I already talked about Chiang Mai, but we work very closely with them also. I can mention this because it started with this in the conference with this program of Asia-Africa that KU has put together. IIAS, we are very happy that we have helped in the establishment of maybe the first Southeast Asian structure engaging with Africa in the region and I think it's very important. Again, it is not developed or initiated by the North, by Japan,China, US, or Europe. It comes from a Thai institution. A Southeast Asian institution and it wants to work directly and in collaboration with partners in Africa. and I think it's a very important undertaking. I hope it will continue to grow and work closely with other institution models that are in the incubation in Southeast Asia. I'm thinking about colleagues in Surabaya or Viet Nam. Both cases are also in the process of thinking of establishing an African connection program. We focus on specificity, so KU has a long tradition of working with Africa and therefore the framework of the engagement is of course connected to

that. But other partners have their own specific approach to this initiative. I would mention finally the Center for Africa in the world which is being set up by the University of Gaston Berger in Senegal which wants to look at Africa and how it is able to reshape its own social science agenda framework, but in open inclusive connection with the partners of other parts of the world - in the Americas, in Asia especially. And that is something that is in the making and we are currently discussing that in the context of the preparation of the Africa-Asia conference in 2023.

So, I think I took quite a while. I just want to conclude again to stress the importance of thinking beyond the world when we talked about sustainability, Global South, Global North. Decolonial. Everybody uses these terms. There is always a trend, a fashion to use new words. The point is really to give meaning to these words and and, in that sense, IIAS, I think, is trying very much to facilitate processes or a genuine, non-hegemonic, self-emancipatory model built on this multi-fuction that I stressed. Multi-sector connection. Transdisciplinary, of course. And multi-stakeholders. So it's a holistic approach, which I think is, in my view, the way to build institutional social sciences frameworks going forward. Of course, it is always by definition to work in collaborative terms. That's why the word ‘civic’ is a good word because, if we connect social science with sustainability and the Global South, I think we cannot avoid also thinking about the civic role of social science institutions, which means civic role of universities. That's the end of my talk, for my presentation with this point.

SPECIAL LECTURE 1

Sridhar Dharmapuri

Challenges of Agri-food System Transformation in the Global South: Sustainability and Resilience

First of all, I would like to thank Kasetsart University for inviting FAO to give a presentation here. Let's share my screen. And let me just say that I'm going to give you and overview of some issues that could be of relevance to the discussion. And then I will leave it all to you to ask me any questions if you have or if you want to carry forward your discussions or in the session in the break out. Largely, let me first say I am not a social scientist. I'm a biochemist and biotechnologist by training. So, if some of the information I give you lacks social economic perspective, please forgive me. But I'm sure all of you are very well informed on that matter, so you can cover that. I'll talk to you a little bit about the challenges of the current agri-food system and why we need transformation in the Global South. We actually need transformation all over the world to have better sustainability and resilience. And this you will find is now very much an issue that's actually on the front pages of every newspaper and every website and probably it's there on your WhatsApp almost every minute. The agri-food system has suffered serious impacts over the last two years primarily because of the Covid pandemic and on top of that now we have the food price rise crisis which has been ongoing and we all feel the effects. But this is not to blame just the pandemic or the current food price rise. The issue has been hanging and has been causing a serious challenge even before the pandemic. There has been a loss of productivity, agricultural production, land degradation, loss of natural resources. a lot of it is attributed to climate change but also otherwise because of practices that we, the population of the Earth, have actually adopted.

All this has led to a point where both the pandemic and the current food price crisis are wake up calls that we need to listen to. So this is the time that we need to transform our food systems to make them more sustainable and resilient but more than that they also need to be efficient and inclusive. All four need to go together. You cannot have one where right now we are actually producing enough food but if you don't take care of the other issues of efficiency, of inclusion, of sustainability, and resilience as a whole. I hope what I will say in the next 15-20 minutes is more about looking at it. It's more about mindset and thinking, how do we actually need to look at our food system.

So in the Asia-Pacific region, and as I come from the Asia-Pacific office in Bangkok. Let me just say we have 46 member states in this region, all across Asia and also the Pacific Islands. We work for all of them and so a lot of what I will say covers the entire Asia-Pacific region and not one specific part of Asia in particular. Here is a region where we have a vast economic diversity. We have countries, one or two, which are in acute emergency and have a humanitarian crisis, where they cannot feed their populations if we do not supply food from outside. We also have rich countries. We have countries that are members of the G20 countries. We have countries that are members of the G8. And then we have a variety of other countries that are low, middle and high income. We also have countries who are developing countries, those who are landlocked and we have small island developing states in the Pacific. So we have diversity. And this diversity is not only in terms of economy, but also demographics, climate, and agricultural sense. In terms of demographics, we actually have a large part of the world in the region such as Asia, particularly South Asia which is young and youthful where the number of people below the age of 30 is the majority of the population.

On the other hand, you have countries which are aging and have less population. In fact, the challenge there is how to keep agriculture going if the number of farmers is getting older and they are reducing every year. Agriculture still continues to be a major source of livelihood. More than two billion people in this continent are dependent on agriculture. But as we all know, and particularly most of you who are socio-economic experts would know, there's a declining share in the GDP so the percentage of the overall, in terms of how much agriculture generates in terms of value, in terms of income is dropping. But the number of people it employs still remains very high, which means they have a low share of national income, which means agriculture is not providing livelihood to the majority. And the majority here are smallholders farmers or family farmers. Again, these are an important vast sector of people who need to be helped and looked after. And second, of course, it accounts for 40% of global emissions. So as you all know from all the discussions on climate change: the Paris Agreement, the COP. Reducing greenhouse gas footprint is one of the most important aspects and that's also to keep the rise of the temperature below 1.5 degrees. I'm sure the next speaker will deal with that in more detail so I won't talk about much.

So overall there is a serious degradation of natural resources because all agri-food system policies have been directed against more production. So we keep producing more and more and use more and more resources but that leads to degradation. So just to point out that the largest producers in the world of rice, fish, eggs, dairy or milk, pork and many other products are actually in Asia. So we are big producers and these are not necessarily the big countries, even small countries produce a lot. For instance, as we know Thailand produces a lot of rice. So the production from across the region reduces and degrades natural resources especially land and water. And we all know that soil

quality and the loss of topsoil and its fertility is a serious issue across. Water scarcity is real if you actually see any Google Map. I mean if you go to Google Earth and look at a map of the world. You will see large areas within Asia are brown or actually dry. They were not like that before. They had water but the continuous use of groundwater for agriculture has made them dry as you can see that very easily. Then you have all the other issues related to the fact that 90% of global aquaculture and 50% of global capture fishery is here. So this can also lead to other issues such as overfishing or not ensuring that fish stocks are maintained, so that year after year, you can get a consistent harvest. Likewise, there is a large share of planted forests but Asia is still importing a lot of wood or timber for its needs. So, again, a case of where over utilizing the natural resources. Also this region is prone to many climate-related disasters. Also multiple hazards such as floods, droughts, hurricanes, typhoons and all the others, earthquakes sometimes that we have seen. And 60% of global fatality and 40% of economic loss from these events actually happened in Asia. So, there is a lot to be done.

Here we are not even talking about economic stalls that we had because of the pandemic and the current food price crisis. And we are currently facing trans-boundary issues like pests and diseases. So taking together serious degradation of natural resources, the threat from multiple hazards and risks and the loss of natural resources, we really have a lot of work to do. If you're going to feed more than five billion people by 2050 and remember we have to produce more with less. We can't use the same amount of natural resources that we have been using. So these are the important questions for all the breakout rooms to consider: how are we going to do it?

And the third thing, this is important, again from the point of view, just of the present but of the future. If the economies of the Asia-Pacific are going to continue to grow or they want to grow at the same rate as they have over the last two decades. They have grown very fast and millions of people have been pulled out of poverty. If you want to do that, they all need to be healthy and they all need to have access to nutritious food. And we do not have that at this time. More than 350 million people, it's actually closer to 375 million people, are hungry. Two million people cannot afford a healthy diet. And that’s like 40% of the population. I talk about this to give you an idea that might interest economists among you. The cost of an energy-sufficient diet, which is the kind you eat almost everyday, is almost 1 dollars a person per day. The cost of a healthy diet, which is a recommended diet, which has all the nutrients, is more than 3.5 dollars per person per day. And if you consider that the poverty line which is about 2 dollars a day. So people earning 2 dollars a day have no way of accessing even an energy-sufficient diet, let alone a healthy diet. This is a contradiction, or a paradox in the region, where we said we produce the largest amount of rice, the largest amount of food, vegetables, pork, eggs, fish and everything else. And yet we have such a high cost of healthy diet.

How do we make this accessible to everyone? So, the three questions we have. One, how do we ensure sustainable production by optimizing use of natural resources? Second, how do we ensure nutrition for everybody? Malnutrition is both undernutrition as well as overweight and obesity across the whole spectrum. Third, we need to do this by assuring livelihood to the two billion people who are dependent on agriculture. They need to get sufficient income so that they can continue farming and at the same time they can look after their families. And those families can lead productive lives and they can be educated. That's the secret of a productive economy.

So the way forward is a more transformation approach. As I said we are not going to look at production alone. We need to look at all aspects of it. FAO's mission now for the next ten years is a transformational approach that results in more efficient, inclusive, resilient and sustainable agri-food systems that leaves no one behind. Leaving no one behind is obviously the principle of the SDGs. But as I was saying from the beginning, we need not just resilience and sustainability, we need efficiency and inclusiveness. Just to give you an idea. I know this wheel looks a little complicated, so I will just try to simplify. In a food system, there are two features. One, there's inter-relatedness and the second there are trade-offs. Inter-relatedness means you have the natural elements. You have climate, air, soil,water, the ecosystem and everything around it. You also have societal elements which include all of us, organizations, universities and the government. And what do they do? They build infrastructure. They set policies, rules and regulations. and that is what governs agriculture. So societal elements are involved. And the third, is what goes on because of the interaction between the natural elements and the societal elements. What kind of agriculture do we have? What kind of sustainability do we have? Do we provide enough nutrition or do we grow enough of each crop? Or what is a balance? How much livestock do we have? How much fish should we have? How do we regulate their stocks? And so on and so forth. Therefore, this is interrelated. So all of us who are here in this meeting today, we're all part of the food system. We all influence the food system in different ways, in some ways we don't even know of and that we'll only know when we talk to each other and understand.

The second part is the trade-offs. Our food system has economic impacts because we talked about jobs and incomes. It has environmental impacts because it's obviously using natural resources. It has a social impact because how much people earn, how much they invest, how much a government and the private sector invest actually makes a difference to what kind of socio-economic growth we see in any country. So sometimes if you influence, if you put too much on achieving economic impact you might have a bad environmental impact. For example, the use of chemicals in agriculture, it's economically feasible. It actually comes at a very low price so people use it. It's easy to use chemicals. There are pesticides and fertilizers in agriculture. Then you get high production so you get high income. But the environmental impact of these chemicals we all

know it's not very favorable. So these are these trade-offs. What do we do to achieve a balance? We can't lose production but we also don't want to damage the environment irreparably, that if we continue to do, we can't just exist anymore.

These are more words to add to the food system. I don't want to repeat the same thing, but just to say that it is complex, and the issues being that we need to ensure that food systems are major contributor to climate change and environmental degradation and we need to change that. Second is to reduce inequalities in food access which lead to nutritional and other social problems. This was the purpose of the UN Food System Summit and where they actually unpacked this whole complex - a picture that I just talked to you about - into five action tracks. So that it becomes simpler for everybody to understand and also to suggest ideas.

The important thing to remember that the discussion on the food systems, through the food system dialogues that were held in every country or in many countries of the world and at the summit, it was participated in by everyone, the representative of everyone - governments, private-sector, civil-society organizations, SMEs, regional organizations, research institutions, universities - everyone. That is again emphasizing the point we are all in the food system. Even if you know it or we don't know it, we are all there and we're all influencing each other's behaviors. So the more we understand how we do that, the better we can control and achieve some of the goals that we're talking about. So there are these five action tracks, which are used to unpack the food systems. Each one of them had an Anchor from a UN agency. The Anchor's job was not necessarily to lead the whole discussion but more to coordinate to make sure that everyone, all the participants, are able to join. We had these five action tracks. First one, ensuring access to safe and nutritious food. Second one is shifting to sustainable consumption patterns. Third, boosting nature-positive production. The Fourth one on equitable livelihoods and value distribution. This is where you have issues like gender and youth - ensuring equality. The fifth one is on building resilience to vulnerabilities, shocks and stresses. And you can see which UN agency led each of these discussions.

So all these need to go together and I think we can't have a discussion without mentioning the impact of climate change. Climate change is a perfect example of this kind of approach we are talking about, that there are so many interconnections between so many things leading to where we are right now. And where we are at a point when IPCC has said that we need to keep the temperature increase to below 1.5 degrees centigrade for this decade. Otherwise, we will reach a point where some of the solutions we have will not work anymore. You can see that many of these issues that are caused by climate change - heat stress, water scarcity, food security, heavy rainfall or ocean acidification - all of them have an effect on agricultural production. Not just for the present but also for the future. This is why it is important to keep this always in mind when we talk about food system transformation. Likewise, another issue I wanted to point out about

interconnections. Two days ago we had a World Food Safety Day and mentioned that there are strong links between environment and food safety. Food safety is not simply about the fact that there could be microbes in the food or there are chemical contaminants in the food, but a lot of it actually comes from environmental pollution and food waste is spoiled for consumption and so on. These connections are important. Those who are working in food safety, that includes people like me, we need to be conscious that it's one thing to make rules and regulations on food safety, but the other thing is to look at how we can change the practices which lead to the overuse of chemicals in agriculture and food chains. Likewise, and that's just an example. I got these slides from the UN Environment Programme who kindly gave it to me. so where you can see that the number of toxic chemicals has risen 17-fold so we are way above what we should be using. In fact, usually when the use of pesticides started out in agriculture, it was recommended as a last resort, that you do other things first, such as biological control, controlling with natural enemies, controlling with cultural practices, and controlling with local agent spot. The use of pesticides are supposed to be right at the end, when everything else fails then the chemicals come in. But the thinking changed so much because the price of pesticides dropped so much and they were available everywhere. So it was simply easier and cheaper just to get those chemicals and use them. Therefore, a lot of the other eco-friendly major positive practices have been lost. And those need to be brought back at this time.

The UN Food Systems Summit was convened last September by the Secretary General of the UN discussed all these issues and they came up with a number of outcomes. but I just wanted to go briefly through some countries in the region who actually put in a lot of food system thinking already in their plans. We start with Bangladesh., Bangladesh is a country which started out it became independent in 1971 it was seriously food insecure, but through a systematic policy mechanism you can see all those written. You can read it on your own later, starting with the National Food Policy in 2006 and then the Country Investment Plan and then the National Plan for Nutrition. Through a sequence of steps, they transform themselves from being chronically food insecure to at least being rice secure. So, secure for rice and then slowly into the other commodities. And you can see a lot of the documents coming out in the last ten or fifteen years. They added in the issues related to nutrition so agriculture now has already a direct interface with nutrition. So what's produced also needs to be nutritious in a way, apart from supporting things like trade.

Then it is now placed on what we have been talking about right now, it's on the food system agenda. There is a lot of interface or interaction with what's going on in the health sector. So nutrition education, women and child diet, 3 dollars to be complementary feeding. These are important from the health point of view so they are now going together with the agriculture policy and the nutrition policy. and there are institutional mechanisms so they have set up departments in the government which exclusively handle these kinds of policies and monitor that. Even right now during the food

price rise, I'm sure they're doing exactly the same thing. They are using all this knowledge to ensure that prices do not rise in the open market that much, that people still have access to the food that they need and to healthy diets. And you can see the results that the problems of undernourishment drop at least by 2% in the by about 8% over the decade. And child undernutrition by ⅓. These are implicit results for a country of that size.

Likewise, the Philippines have chosen 10 action areas on how they want to do it. One of the important things and particularly at this time. When prices are rising, the best way is to use what you have within the country to the maximum. And one of the ways to do that is to reduce food loss and waste. So the more food you can serve and be able to give it a good shelf life, the more that you can actually help to stabilize prices in the country, less dependent on imports and so on. So these are ways in which we can balance. There's also one on sustainability - reducing greenhouse gas emissions. It also helps to meet our climate change goals at the same time. The other thing is to use innovation and science-based farm production. We were talking about a lot of old practices that are being lost but they can be brought back - the unknown gold. A lot of indigenous people across the world own a lot of traditional knowledge of good practices which can be used. So innovations need not necessarily be something like machinery. They can. They can be machinery. They can be digital tools. They can be mapping tools. They can be a whole lot of things but they can also be these traditional practices which indigenous people and the traditional knowledge which was there can actually be used and in the Philippines we actually have a very interesting project on conserving biodiversity among rice varieties, which are locally available. These are even more nutritious than the common variety of white rice that we know.

We now look at a much smaller country, which is Fiji. You can see here there is green food and blue food. Green food means food that uses ecological practices. Blue is, of course, fish. They have a need to ensure that the ocean supplies sufficient fish for their citizens and for their future generations. As I pointed out the importance of traditional knowledge. How can you raise crops without degrading the environment? All that knowledge is pretty much present there thanks to the indigenous people. So there are other trade-offs and we talked about this. To make sure that when you're doing something, when you're gaining something, you're not losing too much. That's a balance. It's probably difficult to have what you have always gained or that the loss is absolutely zero. So you have to strike a balance.

Here are the trade-offs: commercial commodities vs food crops. How much can they produce and export and ensure that there is sufficient food for everyone? And how do you balance the loss of income in case you want to reduce the export? Likewise production vs environmental concerns. Then there's also the benefit farmers against those from the urban dwellers who are actually growing crops at home. So if there's more urban agriculture, more people in urban areas are growing fruits

and vegetables at home, they buy less from farmers who are growing it in the rural areas. So those farmers lose their income. What's the balance here? How do we help both sets of people? So these are issues that we constantly need to keep in mind. Planners need to ensure that these trade-offs are addressed and there's no one solution, no one-size-fits-all solution. Solution may be different for each country. So each country needs to think carefully on who the players are. I'm just saying that in some of these changes, there will be winners and losers. How do we help the losers? Remember you cannot let them lose out and do nothing about it. We have to help and we have to have the necessary social safety nets in place. And those nets will differ but they have to be. so this is the kind of consideration I'm trying to give you.

Just to recap. So this is what I was telling you about trade-offs. If you see all this is the table that was generated by the scientific community of the UN Food System Summit. If you see the first row, it says reducing waste and overconsumption. Now that's something very good and something we should all be aspiring for to reduce waste and not to eat too much because that's also not good for health. But as you can see, it reduces smallholder income. So when smallholder income is reduced, what can we do to support their income? What is the change that they need to make and what's the measures we need to put in place so that they can make the change? For instance, they might need a couple of years to change what they are growing out of what they've been used to growing and grow something else. Or to do some different kinds of farm jobs then we need to support them with social protection schemes or direct benefits transfer and things like that. So we need to have those kinds of programs and that kind of support ready and that kind of thinking ready. So that we can actually support smallholders. Likewise, adopting a healthy diet which is the most important thing you would think at this time but then that negatively affects food access due to prices, so again something to consider. These are the issues that we've been talking about.

The summit actually related food and new food in general but of course all the issues related to food and food systems were right in the center of the discourse. And it has called for all members to take action and that's what FAO was supporting all countries including Thailand with. And there will be more events coming up which I'm sure you will know of. The important thing here is to ensure that science, technology and innovation are all brought in. We already spoke about the use of traditional knowledge, good practices, mechanization, and digital tools, which are very important because they are the fastest-growing sector right now. It's important always to make sure that digitalisation does not leave out anyone. Remember the principle of leaving no one behind. Nobody should be left behind because they do not have access to technology or they do not have a smartphone or they do not have internet connections where they are. So inclusion needs to be made part of this digitalization as part of any other technology that we want to use to help everyone.

So here are the questions that I can just put forward for all the breakout rooms to discuss. You don't necessarily have to follow this but I just wanted you to put these thoughts in your head. The first thing is that in terms of efficiency we need to increase food production, but this needs to happen under the threat of climate change, loss of natural resources. How do we increase productivity of smallholders while using fewer resources and aim to feed more than 5 billion in this region by 2050? Second one, learning from the pandemic and what we've been discussing so far. What is needed to accelerate inclusion of the most vulnerable, women, youth, indegenous people among others, to ensure that these changes are fair and transparent to support everyone? Those who win don't need our support. But those who are not winning need our support. What is it that we can do? Third thing is a healthy diet, which I think does not need much of an explanation. We all need a healthy diet. We all need to fight the risk of undernutrition and overnutrition, obesity, and being overweight. And we need to ensure that 40% of the population who cannot afford a healthy diet right now. How do we promote affordable, safe and nutritious food and also reduce consumption of unhealthy food?

The last one is on sustainability. All these need to be done with reducing carbon footprint. How do we actually support that? Because we need sustainability everywhere, reduce food loss and waster, sustainable packaging materials, minimize use of chemicals. What about people employed in these sectors? What options do they have? Whenever we talk of nature-friendly products or nature positive production, when we go from where we are to another place, what is it that we can assure people? What kind of changes that we can promote and how can we generate this change in employment? Something for all of us to consider.

So I'll stop here and I hope I have made this interesting enough. If not, then please do let me know. It's always good to learn from everyone. And I thank you, Kasetsart University, for inviting us once again.

SPECIAL LECTURE 2

Associate Professor
Dr. Witsanu Attavanich

Climate Changes Impacts and Strategies for Mitigation and Adaptation in the Agriculture and Food Sector

Thank you very much and, first, I would like to thank all participants and organizers that give me a very good opportunity to share the knowledge and experience in terms of climate change research here. Today, I'm going to cover three topics. The first one is the impacts of climate change and then we will go on to the mitigation and adaptation strategies that are the way that we need to do to reduce the impact of climate change and to my research experience in Thailand. I will show some examples that we did in the past of the impact of climate change and also mitigation and adaptation strategies in Thailand. Let me share the screen.

Here is the topic - Climate Changes Impacts and Strategies for Mitigation and Adaptation in the Agriculture and Food Sector. The outline of the lecture today. I would cover five topics. The first one, I will just provide you with some background about climate change and greenhouse gas emission. Then, we will go on to check the overall impact of climate change and then we will specify the impact of climate change on the agriculture and food sector. Then, we will address the problem of the impact with mitigation and adaptation strategies. Then, I will just end with the policy timing in terms of how the policy makers tackle the problem of climate change.

Let's start with the first topic, on climate change and greenhouse gas emissions. Many of you may know that greenhouse gasses absorb infrared radiation, trapping heat that would otherwise radiate into space. You can see, this is the Sun and this is the Earth, and greenhouse gasses cover the Earth like a blanket as you see from here. This is the atmosphere. In this atmosphere, we have carbon dioxide and other gasses. These gasses trap the heat from the Sun. If the heat from the Sun goes to the Earth, usually it will reflect it back. But the problem here is these gasses trap, at the end the heat still returns back to Earth. If we have an appropriate amount of greenhouse gas, it's good for our earth because we can stay warm. Without greenhouse gasses we all die, because the temperature will be very low and we cannot survive. But with this moderate warmth, human life can survive. But the problem here is now we have more and more greenhouse gas emission

that turns out to be this blanket that covers the earth. It's thicker and thicker. What happens here with a thicker blanket? We have more heat that reflects back to Earth. That's why we usually call this one global warming. It's actually not just global warming. Global warming is just a physical observation that we can see from the big term we call 'climate change'.

And if you go back to track the record of greenhouse gas from 1966 until 2020. What do you see from here? We have increasing emission of greenhouse gas. The color shade here captures each part of the world: North America, South and Central America, Europe & Eurasia, Middle East. And China is the upper one here. If we sum up across all parts of the world, the trend of greenhouse gas increases over time. We were really lucky during covid-19 pandemic that the emission decreased. But over time we can say that the trend is increasing. And if you go back and then see Thailand is in here: Asia-Pacific, the orange part here. With increasing greenhouse gas emission, the blanket as I told you becomes thicker and thicker. Scientists usually measured this thickness of blanket using the term concentration of CO2 in the atmosphere which I will tell you later on.

The next slide here shows you the emission of carbon dioxide for each country around the world. This part you can see which country emits more or less greenhouse gasses. China is the first one, followed by the United States, India, and Russia. Here, if we break down the emission into each economic sector, we can break down into energy sector, agriculture sector and forestry, land use sector, waste sector and industry sector. What do we see from this chart? We can see that the major contributor of greenhouse gas, the first one is energy accounting for 73.2% of total greenhouse gas. You can see the focus today is the agricultural and food sector which is in this green shade. It's the second largest polluter of greenhouse gas. It's very important that we tackle the emission of greenhouse gas in agriculture and the food sector.

And this chart shows you the emission of greenhouse gas. According to this one, Burning fossil fuels contributes greenhouse gas to the atmosphere at 9.4 gigatons and you can see deforestation also emits greenhouse gas. The good news is that we're very lucky nature helps absorb CO2. For example here, forest captures the emission down around 3.4 gigatons and also the ocean also absorbs greenhouse gas emission of 2.5 gigatons. The bad news is what? Nature cannot help us all. Emission here, if you sum 9.4 and 1.6 together, we have 11 gigatons, but nature can help absorb just a half. So that means the remaining still goes to the atmosphere and generates global warming and climate change. The right picture shows emissions. First one here comes from fossil fuels, a major contributor, and the land usage. And the lower part here shows you how the CO2 emission can be captured. The ocean, soil and plants can help absorb CO2. The red one here is a problem. CO2 here goes to the atmosphere. You can see from the past to the present that this contributes to larger and larger over time. So that means we can get more and more warm if we don't stop emission of greenhouse gas.

Now here as I told you, when you emit more greenhouse gas in the atmosphere. Scientists measure that by the concentration of atmospheric CO2. The unit is in PPM: Part Per Million. Over time we have the tools to measure atmospheric CO2. Around 1957 we had around 300 PPM, but now what happened? Last year in September, we already broke 400 and then 410. We are here. So that means the blanket that covers the Earth becomes thicker and thicker over time. Many of you may observe that this is not just a problem because it increased just one hundred parts per million, from 300 to 400. That should be fine. But what happens if I show you the next slide? Scientists track the CO2 in the atmosphere back 800,000 years ago. The zero here means the year 2008, the minus sign here shows you the years we track back. So that means we track back the data of atmospheric CO2 to 800,000 years ago. You can see that overtime greenhouse gas atmospheric CO2 is not greater than 300 parts per million. Now we observe that in 2020 we are here. So what does this mean? We are out of the history right now. Believe it or not, at the end of the century, in 2100, the worst case, if we don't collaborate, or try to reduce emissions, we will stay here at 900 parts per million. It is just about three times higher than 800,000 years ago. Even in the optimistic case we still stay here, 550 parts per million. So what did you see from here? Can we buy anything about the impact of climate change? Can we use the impact in the past and project the impact in the future? It's kind of hard, right? We are out of the history right now. So the impact in the future may become bigger and bigger than the historical level. So this is the thing we have to think about and then tackle the problem as soon as we can. That is the interaction of the first dimension of economics. We have to find a way to reduce greenhouse gas emission.

The second part is the problem also if you observe the scientific information of greenhouse gas. When you emit greenhouse gas today, it does not disappear tomorrow or the next two years, but scientists quantify the lifetime of this atmospheric CO2. You can see that there are many types of greenhouse gas. And an average lifetime in the atmosphere means when you emit this greenhouse gas today, they will stay with us for a while. 12 years for methane. Carbon dioxide, 50 to 200 years. So you can see they stay with us for a while before they disappear or decay. The right column here shows you the global warming potential of 1 molecule of gas over 100 years. This means that each type of greenhouse gas provides a different global warming impact. 1 here is carbon dioxide. methane 21 meaning that methane gas can provide or generate global warming 21 times more than Co2. Nitrous oxide 310 means it can provide global warming potential more than carbon dioxide 310 times. So another dimension of the economy for the climate change problem is about the damage or the impact. Even if we stop emitting greenhouse gasses today, we still cannot avoid the impacts of climate change because they will stay with us for a while. So that's why we also have to do another type of strategy that we call adaptation strategies. We cannot avoid the impact of climate change but we can reduce the damage impact of climate change. So basically

in a climate change area, the way that we tracked the impact of climate change was mainly due to strategies. The first one is called mitigation. And the second one is an adaptation strategy.

Here are the latest research findings from IPCC which is Intergovernmental Panel on Climate Change. This is AR6, Assessment Report 6. This is the latest published record in 2021. This organization projected the temperature increase in 2100, at the end of the century. We will still have global warming compared with the current time. Roughly 1 - 5.7 degrees celsius. Can you imagine in Thailand during April in the afternoon if we have to go outside we have to face higher temperatures so it will be a problem for us. They try to project the future temperature warming in different scenarios, starting from very low greenhouse gas emissions, low, intermediate, high and very high, depending on whether all countries help reduce the impact of climate change or not. You can observe from here that here they put 'likely', so that means among five scenarios here, the third scenario, SSP2-4.5 is very likely, meaning that during 2041 to 2060, we will have 2 degrees celsius warmer temperatures and at the end of the century we are expecting around 2.7 degrees celsius. If we do nothing, we may face 4.4 degree Celsius at the end of the century. And the very likely range we could reach is 5.7 Celsius. This is very critical. Here on the left, I'm trying to explain to you the previous slide. SSP here is the abbreviation for Shared Socio-economic Pathways that capture the way that society changes the future. You can see from here the vertical axis captures socio-economic challenges for mitigation and the horizontal axis here shows socio-economic challenges for adaptation. SSP1 has low challenges from both mitigation and adaptation. We call this one sustainability path. That means everyone, all countries help each other reduce greenhouse gas emissions to adapt to the changing climate. This is very good. But what about SSP3? Regional rivalry scenario that means each country is all selfish. They don't want to help reduce the impacts of climate change. They don't help reduce greenhouse gas emissions. So in the end, we will get trouble with higher temperatures. SSP2 here we can call middle of the road that is the scenario that is in between best and worst scenarios. This is just a brief explanation of shared socio-economic pathways. Turning to the right, upper and lower part. The upper part shows you the global surface temperature that is projected to increase. This is based on AR5, assessments report 5, in 2013. The latest one here is 2021. What do you see from here? The latest findings show us that we can get more temperature increases in the future. That is very serious. Now we need to do something to reduce the increase in temperature.

So now you see the general picture of the impact on climate change. Now, let me show you specifically the temperatures. The left side shows you about the movement of our globe, how temperature is warming overtime. The right side shows you the change in the temperature if we compare temperature with the average level. You can see from here that the blue bars and the red bars. The blue bars show you the temperature during that time is below the average. The red bars

here show you the period that the temperatures are higher than the average level. What did we see from this chart? From 1880 until 2022, you can see that we have already right now 44 consecutive years since 1977 that the temperature is above 20th-century average and, believe it or not, 7 hottest years in the world happened in the last 7 years: 2015-2021. 2021was the sixth warmest year in NOAA's 140-year series. This is just a reflection and the evidence that we are facing a warming temperature.

Now let's move on to the impact of climate change on extreme events. Many of you may know the terms El Niño and La Niña. This also reflects extreme events. When we have El Niño in Thailand, we usually have more droughts, less rainfall. If we have La Niña, we usually have more rainfall and lower temperature. The way that we usually measure these extreme events, we use the Oceanic Niño Index, or in brief, ONI. If ONI index index is positive means we have more power of El Nino and negative shows you what we have more lanina. What do we see from this chart? In terms of El Niño, we have more drought and less rainfall. It seems to us that we have higher magnitudes of El Niño. probably in the future we will have more drought and less rainfall in Thailand. This is going to impact people. And what happens with La Niña, so we have less magnitude over time, which means, it can imply that in the future if we do nothing we will face the impact of climate change. We will have more extreme events, especially El Niño in this case.

The Global Risks Report also tries to measure the impact of climate change on what we call Global Risk, basically World Economy Forum by global research report. Here, they ask the CEO of big companies whether there is any global risk that they are concerned about and rank first, second, third and so on. Over time you can see in 2017, number one was weapons of mass destruction. Over time the responses changed. What did you observe from this chart? Climate action, natural disasters, water crisis, extreme weather. They are all related to climate change. And if you go back up to 2018, 2019, 2020, and 2021, the real concern of the risk on the global level is all about climate action failure, extreme weather, water crisis. The latest report in 2022 shows climate action failure as number one, extreme weather, biodiversity loss. These are all related to climate change. This is the most severe risk in the next 10 years. If we focus on the short-term, only 0-2 years from now. In the next 2 years, what are the concerns of global risk? Number one is extreme weather, livelihood crisis, climate action failure. You can see from here that climate change is still at the top of global risk. The next 2-5 years are still climate change action failure, and extreme weather. This is still on the top of the list. So that means the risk of climate change is not just a small concern but now we are concerned at the global level. And this is the conclusion about the impact of climate change. The change in temperature, precipitation and sea level rise can affect us in health impacts, agriculture impacts, forests impacts, water resources impact, coastal areas and the last one, species and natural areas. So you can see climate change can affect us in all aspects.

Today we are going to cover the term climate change in agriculture and food. This picture shows you if we think about industries. Climate change is affecting the energy sector for sure because they are the major emitter of greenhouse gas. Also agriculture. But what happens is it's also affecting supply chains and operations. Climate change is not just an issue for policy makers and scientists, but that it has tangible implications for companies and industries. You can see it from here, cloud sourcing, H&M fashion until banking, the financial sector and the leadership are also involved in climate change. If you think about agriculture, what happened with H&M, this is related to fast fashion. They use raw materials such as cotton and that is related to agriculture. If we have damage to cotton due to climate change, this company will be adversely affected by the climate change. Also, this is an example that climate change impact is very close to us. We can easily obtain or face the impacts of climate change.

Now, if you think that you are the owner of a firm in the food or agricultural sector. First, you have to choose the site, the location, the capital, which machine you have to use, and how many laborers that you will use for production. You have to find a way to ship the raw material then to the customer via supply chains and distribution networks. and also send to consumers products and services. I just want to tell you that the decision that you have to make, they are all facing the risk from climate change. You can think about the location, from a business perspective. The owner of the firm may face the risk from flooding, coastal locations and infrastructure, or maybe water scarcity. You can imagine the EEC area in Thailand. They are facing the problem of water shortage. They may face the risk of reduced access to capital. In the great drought in 2011, you all remember the car factories in Thailand are all flooded. That is a huge loss. For the labor, if they have to work outdoors with higher temperatures, they may get sick and productivity of the labor may decrease. In terms of supply chain and distribution network, when we have floods, we cannot ship the goods from source to destinations. And with consumers, what happened? Right now the taste and preference of consumers has changed. For example, they may want to buy environmentally friendly products. If you don't adjust the way you produce, that business will be affected by the change in preferences.

And now if we focus on the agricultural and food sector, you can see how climate change can impact the agriculture and food sector. Climate change at the very beginning can affect, for sure, crop yields. Plants, like humans, can grow at the range of temperatures. We have warmer and warmer temperatures. Sometimes the plants cannot survive or they can grow but lower than they should be. Climate change can affect crop planted area, livestock productivity, pests, insects, diseases and forest fire. If you read the report, you will see that with warmer temperatures insects and pests can expand very fast as compared to the cold temperature. And what happened, you can think of farmers, they will probably have to use more pesticides to kill insects and pests, more

cost of production and risk to human health due to the pesticides and herbicide. Climate change can affect water supply. You have less rainfall so we have less supply of water. Next, this is not related to physical impact but it's about economic impact which is a non-tariff barrier in the future. If you produce goods and services that are not environmentally friendly, you might face non-tariff barriers. You cannot import or export goods that are not up to standards. If you listen to the news about the European Union right now, they are implementing the cross-border tax adjustment. That means if the goods produce more carbon dioxide or greenhouse gas emission, the European Union may impose more tax on those goods. So what happens? The price of the product might be higher in the European market. That reduces the competitiveness of Thailand's goods and services. At the end, what happens? These changes will affect, the first one, export revenues. We are exporting our agricultural and food products. We are the kitchen of the world. We are a major exporter. So this change will reduce the revenues of exports. Secondly, this change, especially climate, will affect the welfare of farmers and firms. At the end, Food Security where we are facing right now with the higher price of fertilizers and the war. We have the price of food and agricultural products increased.

This is just the thing that links to climate change and now let me move on specifically to the food sector and link to agriculture more.

This picture shows you about what we call, 'Food System'. Food system just shows you the activities across the food supply chain. Starting from producing, to processing and packaging and then we have to ship for wholesaling or retailing and then at the end consuming. And also along the way, for each stage, we have the storage for the food and agricultural products and some of the process will generate waste that we need to dispose of. Along the way we have activities of transporting and trading. This is the whole picture of the food system and we believe that a stable or reliable food system will lead to food security. Without a stable food system, we will face food insecurity at the end. This is the report that I have a contribution with the USDA in the US. This is the first research that gave me experience on the food system at the global level. If you imagine from here, if you think about the impact of climate change, what happens? Climate change can affect all activities in the food system. Climate change can affect transportation. If we have a flood, we cannot ship the food to the destination. You can think about the war right now. We have the war in Ukraine, and sometimes we cannot ship the food from Ukraine to Thailand, or to around the world. We are facing a shortage of food due to the sensitive food system. Climate change can affect packaging of food also. Can you imagine if we have a warmer temperature and the package that we use to store the food, at some range of temperature it is okay, but if it is out of range, it is a problem. We will have more bacteria in the food because it can go bad. It could be toxic. If you have time I encouraged to you to see the link of this video there's a short summary of food security and the food system that link with the impacts of climate change

This is also another research that I had a chance to write with the folks in the US. This is about 'Do markets and trade help or hurt the global food system to adapt to climate change?' Basically you can see we talked about international trade. Usually, trade is an important activity in the food system. As I told you, climate change can affect the food system via trade activities. And also climate change can contribute to food insecurity at the global level. If we have something that affects the trade, like the war. At the time we were writing the paper, we didn't focus on the Ukraine war. During that time, we focus on the policy of the US. If you remember during the Trump presidency, we call it 'American first'. And the Trump administrators tried to do anti-trade. They tried to stop free trade around the world. And we were concerned if we stop, or reduce the free trade, we may have a problem. For example, food availability and stability will be affected. This also affects the price of food and agricultural products. Right now we can see it easily because of the war in Ukraine.We have a very high price of food right now. We also have a shortage of food. That's another aspect of food security. We call it food availability in this case. What happens with trade affects poverty, economic growth and employment. You can imagine right now we have high fertilizer prices and food prices. They probably have a bad situation right now. And also low income people. In the end, what happened? Household income will be affected and at the end household food access cannot be secured. At the end we will face food insecurity. That is the problem that climate change can link to the food system and household. You receive the impact of climate change.

Now we focus more on crop production. Climate change can shift crop production patterns. If you imagine we have a warmer temperature over time. This is a map of the United States. If you know the geographical location of the US. In the upper part, the weather is very cold. And the south is hotter. What happens with climate change? At first, this area usually plants wheat because wheat can survive in cold winters. That means the upper part of the US usually grows wheat. And in the middle and the south, they grow corn or maize. What happened with climate change? When we have warmer temperatures. This area was originally appropriate to grow wheat. Right now they grow more maize and corn. The production of corn shifts northward, up to the north. This results in a projection in the future. With warmer temperatures, we will face a change in crop production pattern. You can see from here. On the left is the base scenario. The right is the future scenario in 2050. What do you see? You can compare the left and the right picture. You can see here that the green area becomes more and more. The green area captures excess supply of corn. The red area is the excess demand for corn. That means corn has become more and more in the upper part of the US. How is this important when we know this research finding? If corn will grow more in this area, you have to think about infrastructure, especially transportation. How can we ship corn from this location to the demand destination or the rest of the world? If we decide the logistics of the

infrastructure, they will be cost-effective and at the end we will have competitiveness in the world market. This knowledge can help to set up warehouses, the transportation infrastructure, the grain silo or something like that. So we can prepare for the future changes. I just want to say to you that climate change can affect the crop patterns by shifting the production to the north. This is the case of the US.

Here let's see Thailand. I just tried to draw the centroid of in-season rice production overtime from 1982-2016. The centroid means the center of rice production in Thailand. And overtime what happened? If you observe. the centroid shifts overtime northward also. It shifted around 72 km upwards. So the rice production for in-season rice moves northward also. If you are the millers, you want to build a factory, you have to think about the movement of rice production also. This is the centroid of in-season rice production. You can see from here the rice production that also moved northward from 2531 (1988) to 2555 (2012), shifting Northward. This is the movement overtime shifting around 90 km northward. So you can think about in the future, it will move more and more northwards. This is the way that we change climate change affect crop production patterns

Now what is the impact of climate change on Thai economy when we face with production pattern change? If we observe the overall economy, this is the study findings from German Watch last year. They try to measure the damage of climate change. Basically German Watch try to calculate fatalities induced by climate change, the loss induced by climate change and the number of events. And if you observe from here, Thailand, we are in the rank 9 out of 10. We are expected to have the highest risk of climate change. Approximately right now we face the damage of around 0.82% of our GDP. And if you observe these kinds of countries that are in the top tier. We are pretty much in a good position. We are an upper income country, but still we are facing a higher risk of climate change. This is very important that we have to address.

Here is another research institute, Swiss Re Institute. They also observe the impact of climate change on the Thai economy by the percent of GDP. They rank among 48 countries around the world and the GDP of Thailand is expected to fall 44% depending on the severity. They identify the risks on the Thai economy, basically coming from crop yields. We will have more heat stress. Farmers working outdoors will face higher temperatures. They get sick and the productivity of labor will decrease. This also affects tourism. Out of 48 countries, we rank 45, so that means we are very risky right now. We are below the table. The dry seasons will affect more than wet. We have less adaptive capacity. We need to improve our adaptive capacity. This is the overall view of climate change impacts on the Thai economy.

Now, let's move on to Thai agriculture. We can say among all economic sectors, agriculture is the most sensitive economic sector. Why? You can think that here we have around 8.1 billion households in agriculture or roughly around 12.6 million people that work in agriculture. Or

approximately 34.1% of the total labor force and we have 8.6% of GDP. What does this statistics mean? We have more people in the sector but we have less value added. So that means people in agriculture are poorer than other economic sectors. We have low income people in agriculture. And climate change likely affects this agriculture. The farmers in Thailand also have low education; only 4.46% graduated at least Grade 12. And most farmers are smallholders. Thai agriculture is also facing the aging problem. The lower picture here shows you 20 years ago, 2001. Vertical axis captures the age of the farmers. 20 years ago those who have the age lower than 40 years old are around 53%, now in 2020 we have less young workers in agriculture, we have only 27%. How about the aged population? 20 years ago we had 7% of people over 60. Now we have 20%. Agriculture has an aging problem and it is more serious than other economic sectors. At the national level, I think this is just around 13%. The other point that climate change will seriously affect agriculture is because only 26% of agricultural households could access the irrigation system. You can see from here. This is Thailand map. We have the dots. The blue dots are those who can access the irrigation system. And the orange dots, no access to any. They have to wait for the rain only. What happens in the future if you link this with El Niño? We will have more droughts. We will have less rainfall. So around 74% of the farm household will be adversely affected by climate change if we do nothing.

Now this is the projected change in temperature according to one of the studies that my PhD student worked on. So the projection in all regions across Thailand we are expected to have higher temperatures and also here more rainfall in each part. The right side shows you the change of population. The green one shows you that in the future they will have more population and we'll have less population in the upper parts of Thailand. So basically people in the North and the Northeast will move to Bangkok and even to the southern part of Thailand. With this projection in the future, we can project the impact of climate change on rice production. For example, the left side shows you in-season rice in the irrigated area, and the baseline which shows you which area produces more rice. The next two figures show you the change of figures in the future, RCP 4.5 and 8.5. RCP is Representative Concentration Pathways. 8.5 here, we will have a stronger impact of climate change due to higher emission of greenhouse gas. Basically we will have more rice production in the irrigated area. But what happens with the non-irrigated area? We have less in-season rice in this case. It is projected to reduce around 32 to 42% in this case. And this is out-of-season rice, it's also expected to reduce very little, around 1 to 2%. Overall, if we combine in-season and out-of-season rice, Thai rice production is expected to decline around 10 to 13%. and the northeastern part of Thailand will be adversely affected in this case.

Now let's move on. This is the impact of climate change on sugarcane and cassava. You can also see that all of these products are expected to be adversely affected by climate change. This is the cumulative damage if we combine all activities in agriculture over time if we project and

calculate the damage until 2045 at the national level. Climate change will damage our agricultural sector roughly around 17 to 83,000 million US dollars. If we break down the farmers into those located in irrigated areas and farmers who are in rain-fed areas. You can see from here that the damage in the rain-fed area will be higher than irrigated areas. This is the breakdown of damage into provincial level, so you can see which provinces are expected to get more damage. In this case, the southern part is expected to have more impact including the eastern part.

Now we go to the next one: the factors driving climate change solutions. We have to solve the problem and right now we have to think about how seriously we tackle the problem of climate change. So basically climate change now is not just a global trend. It is not just politics. There are other main drivers that induce climate change Solutions. We have more empirical impacts of climate change, from the past to the present. We have more scientific data that reflect future violence and damage if we don't address this problem. Now consumers and investors are increasingly focused on green production and consumption. So I want to say to you that, in terms of production of agriculture and food, you have to adapt and do something to address the problem of climate change. This is the nature of the climate change problem. The question is why. From an economic point of view, it is a public good. Global atmosphere is a global public good. It is not just a general public good. Public goods in the economy are goods that cannot be prevented from using them. It is a product that is not shared in consumption. This leads to the problems of free riders, which means, I don't have to do anything and I will have that, I will get the benefit. So people just ignore the problems and wait for other people to solve them for them. In the end, the problem isn't solved. So the problem of climate change is not just public goods, but it's also international externality. Meaning that if the problem happens inside one country, we can use laws and regulations to address the problem. But now it is at an international level. For example, China emits more greenhouse gas, how can Thailand tell China please stop emitting greenhouse gas. Can we do that? So collaboration is very, very important in this case. And both international externality and public good, they both create what we call market failure and they will create inefficient allocation of limited natural resources and the environment and also cause problems of fairness among generations. This is not the problem with the current generation. It is a problem for future generations. You have to think about future generations also.

That means international collaboration is very important for solving climate change. There are two main strategies in solving climate change. We have mitigation and adaptation strategies. In brief, mitigation means attempts to moderate the temperature rise by reducing emissions, increase planet's capacity to absorb greenhouse gasses. Adaptation is about modifying the natural or human system to minimize harm. There's autonomous adaptation and planned adaptation. Autonomous adaptation means people will automatically adapt. For example, we stay in an air-conditioned room

to avoid the heat outside. This is the way we adapt. Planned adaptation is something that the general public cannot do. For example, building infrastructures that require help from the government. In the Thailand context, if you want to address the problem of climate change, you can do mitigation and adaptation strategies. First, we have to develop a Measurement, Reporting and Verification system, or MRV, and a monitoring and evaluation system. We need to support knowledge for the private sector to measure the amount of greenhouse gas emissions. Greenhouse gas emissions disclosure and delivery laws. Right now all firms don't want to provide data. We have to introduce economic measures and financial mechanisms. We have to support sectors to access funding sources such as green bonds and green loans. We have to promote access to technology to reduce greenhouse gas emissions at a reasonable cost. Right now, clean energy is very costly. We need to find a way to reduce the cost.

We need to introduce economic and financial mechanisms so we need to incentivize people to change their behavior and help reduce the impact of climate change. Usually, you all may know, in economics, we have a Carbon Tax and Emissions Trading System. We try to put a price on carbon. If you emit CO2 in the atmosphere, it is not free. There's the cost of emission. These measures will send price signals to economic actors to make carbon-informed decisions and it will affect investment decisions and consumption decisions. In the end, this measure will lead to green technologies. Less driving and more public transport, for example.

For Thai agriculture and food, we have to raise awareness of the farmers in the affected areas. We have to invest in expanding irrigation and other water sources in the rainfed area. We have to put more incentives to encourage investment in water-saving technologies especially in areas where water is scarce. We have to develop a mechanism for collecting water bills in water scarce areas (water pricing). The form of assistance should be changed to conditional assistance to incentivize farmers to improve their production. This is the research that I did with the team from the Bank of Thailand. So we combine and analyze the way the farmers receive help or assistance from the government. Basically the majority of the help we can call it unconditional assistance. So we just get the money and then that's all. You don’t need to adapt or adjust any productivity. That’s something we have to change. If we get the money, we need to adapt and adjust to improve productivity and reduce the risks of climate change. We have to encourage small farmers to access modern technology and Innovation. We need to provide knowledge about risk management and accelerate the development of a risk management system. Emphasize also the development of heat-resistant plant species to adapt to the warming world. We have to support the central database development for climate change analysis. We also have to integrate all government organizations to solve the climate change problems. Basically right now we are fragmented. We have to promote mitigation and adaptation practices, such as Alternative Wet and Dry for rice production (AWD)

by providing the knowledge with the help of local educational institutions. And also we have to introduce an agricultural insurance system to be widely used by farmers.

This is the picture that shows you the adoption of digital applications in Thailand. Right now, farmers adopt around 40%. But if we focus more on what we call precision farming technology. Only 6% of the farmers adopt this precision farming technology. That means we have to encourage more adoption so we can adapt to the world of changing climate. This is a statistics that shows you if we do AWD - Alternative Wet and Dry -, it can reduce greenhouse gas emissions here. We can also reduce burning and can also reduce greenhouse gas. And also air pollution. SSNM here is the soil analysis. Improved feed of livestock and also we can do what we call biogas and manure management. This can be the way to reduce greenhouse gas and it can help reduce the impact of climate change.

Last but not least, this is something that is still the problem of climate change. First, there are enormous uncertainties associated with climate change because the future is hard to project the damage. Benefits from control are received in the distant future, while the costs occur now. This is also another problem. And uncertainties about the costs and benefits are also problematic. Governments must make decisions without complete information. I understand this is the difficult part for the governments and policymakers. But we need to do something to reduce the impact of climate change. And for those who are interested in the topic of climate change, I encourage you all to watch this video link here. This is from the Bank of Thailand Symposium in 2021. It will show you about the greenhouse gas emission and also how we adapt to the world of changing climate for Thailand's context. And that's all my presentation. Thank you very much.

People, Power, and Promotion of Sustainability

Economical and military role and significant of state's civil conscription of Siam in Ayutthaya period

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Abstract

The origin of Ayutthayan State's Civil Conscription or "Prai System" is still obscure, but it has believed that the origin of the "Prai System" has occurred together with the origin of the Kingdom of Ayutthaya in 1350 AD. until It has been reformed in late 15th century and then still in practice until the collapse of Kingdom of Ayutthaya The "Prai" system has forced all of male citizens to bind themselves for the state's administration and distribute them into several distinct state's departments commanded by the elite Ayutthayan citizens or "Moonnai" as the department's conductor. The Prai system or State's civil conscription has established as the economical basis and military stability of the Kingdom of Ayutthaya. The Prais or common Ayutthayan male citizens played the important role for both economical and military Ayutthayan affairs for centuries, before it's declined in late 17 century by the cause of foreign maritime trading growth and this decline also was one the major cause of the collapse of the Kingdom of Ayutthaya in late 18th century.

Keywords: Ayutthaya, conscription, Prai system, Siam

Background of Prai System

"Prai" (ไพร่) refer to male citizens in Ayutthaya period who have about up to 2 and a half "Sok" tall (It's about 75 cm. tall.) (Piyachat Pitawan,1983,p.1.) that have to be registered themselves with "Moonnai" (มูลนาย : Master, elite Ayutthayan citizens) for offering their free state's labour and military conscriptions exchange for the right and the protection as a legal Ayutthayan citizen. Meanwhile, all of female citizens were exclude for any state's labour and military conscriptions. The "Prai" system or state's civil conscription has forced all of male citizens to bind themselves for the state's administration and distribute them into several distinct state's departments commanded by "Moonnai" as the department's conductor.

The origin of Prai System is still obscure, but it has believed that the origin of the Prai System has occurred together with the origin of the Kingdom of Ayutthaya in 1350 AD. (Anchali Susayan, 2009, p. 36.) Event Prai System was exist in the early Ayutthayan Period but still incompleted and disorganized in practice until late 15th century in the reign of King Boromatrailokanath. He has achieved his great political reformation for centralize his administrative power and authority through his dual chancellors, The "Samuha Nayok" (สมุหนายก : Chancellor of the Interior Territories Affairs) and The "Samuha Kalahom" (สมุหกลาโหม : Chancellor of the Military Services). The cause of this great political reformation due to the Annexation of the Kingdom of Sukhothai into Ayutthaya's rule (Somkiat Wanthana, 2018, p. 296.) so he, King Boromatrailokanath, has to strengthen his authority for govern his new vast annexing territories and people.(Sunait Chutintharanond, 1990, p. 93.) King Boromatrailokanath has enacted "Pra Aiyakarn Tamnaengna Polaruen" (พระไอยการตำแหน่งนาพลเรือน : The Act of Civil Grading) and "Pra Aiyakarn Tamnaengna Taharn - Huamuang" (พระไอยการตำแหน่งนาทหาร – หัวเมือง : The Act of Military Personnel and Provincial Officers Grading). These 2 new acts have simultaneously proclaimed along with his great political reformation for adjusting the Prai System. All of Moonnais and Prais in the realm have to categorized into many hierarchical civil class, prescribed by the limited right to possess the lands called "Sakdina" (ศักดินา : Right or Privilege to possess the land). These acts aimed to used the new categorized hierarchical civil class for increasing the ability and effectiveness of the State's Civil Conscription for labour, economical purposes and military services.

Roles and Significant of the Prais in Ayutthaya's Economy Affairs

From late 15th century in Ayutthaya Period, by virtue of "Pra Aiyakarn Tamnaengna Polaruen" (The Act of Civil Grading) and "Pra Aiyakarn Tamnaengna Taharn-Huamuang". All of the Prais in the realm were separated into 2 distinctive type. the "Prais" who have forced to offering the state their civil free labour for 6 months per year in peaceful time and full military services in war time called "Prai Luang" (ไพร่หลวง : Citizen of State). Another kind of Prais ,granted by royal authority, heve offering their lifelong services only for the "moonnai" called "Prai Som" (ไพร่สม : Personnal servant of Moonnai).

Moreover, specifically for the "Prai Luang", they can offering the tributes called "Suai" (ส่วย) to the royal government (passing throught by their Moonnais) for compensating and abstaining their own annual state's civil conscription. These compensating tributes may be the rare and expensive stuffs and goods, collected from the jungles, that have been required by the royal government for foreign trading or event later the cash can also be paid for it. (Piyachat Pitawan, 1983, p. 17.)

The “Prai Luangs” have forced to offering the state their free labour for 6 months a year in peaceful time and and spent another 6 months for their own agricultural earning. (Piyachat Pitawan,1983,p.4.) The kind of services of the “Prai Luang” ,how hard and troublesome, depended on the state’s department they have belonged to, each state’s department conducted by the Moonnais. For the sake of annual state’s civil conscription, all of “Prai Luangs” have theoretically forced to live in permanent resident, No migration can be legally allowed. But quite different for what actually happened, The Prais can work and even travel freely as long as the royal government has enough labour responded for their project,appointed by the royal ordain. (Warangana Nibhatsukhkij, 2007, p. 129.)

Except for their privilege to conscript the Prais for agricultural working on their own land, another obvious privilege of the class of Moonnais was to use their own Prais as the trading partner traveling for their mutual commercial benefit. The Prais can event be a private merchant if they can deal with and offer the proper benefit to the Moonnais.

Until 17th century, the Ayutthaya ‘s political and administrative structure has tremendously changed. The dual state’s chancellors, The “Samuha Nayok” (สมุหนายก : Chancellor of the Interior Territories Affairs) and The “Samuha Kalahom” (สมุหกลาโหม : Chancellor of the Military Services), has shifted their duty and authorities. By new royal ordain, The “Samuha Nayok” or the Chancellor of the Interior Territory changed his duty to be the Northern Chancellor, conduct all of civil and military affairs in the northern provinces and regions and The “Samuha Kalahom” likewise to the Southern provinces and regions. The authorities of Dual Chancellors, established from late 15th century, formerly according to their distinct kind of political affairs they were responsible that have been changed according to the territories they have authority to conduct. (Manop Thawornwatsakul, 2004, p. 151)

The cause of this political and administrative tremendous structural change was the royal distrust in the increasing power of the high nobilities or “High Ranking Moonnais”. The challenging power of these high nobilities to the royal authority derived from scale of the land and wealth especially the mumber of the Prais they have possessed. From late 16th century many Ayutthayan kings have been overthrown by the high ranking nobility because of the weakness of civil and military conscriptions for support the royal business and security by the royal household. In late 16th century, King Ekatodsaroth has enacted many royal decrees to reduce the right and authority to possess the Prais of the nobilities and likewise increased and returned such right and authority back to the royal household. (Manop Thawornwatsakul, 2004, p. 231)

In early 17th century, Fore coping with the nobility’s power challenge, King Prasathong has increased his authority by transferred many armed force and state’s security’s departments (Manop Thawornwatsakul, 2004, p. 249) such as “Krom Kochabaan” (กรมคชบาล : Department of

Royal Elephants Services), “Krom Pra Asvaraj” (กรมพระอัศวราช : Department of Royal Equestrian Guard), “Krom Lom Praratchawang” (กรมล้อมพระราชวัง : Department of Royal Palace’s Guard), “Krom Chang Puen” (กรมช่างปืน : Department of Gunsmith), “Krom Pra Saeng Puen” (กรมพระแสงปืน : Department of Royal Firearm), “Krom Mahaadlek” (กรมมหาดเล็ก : Department of Royal Chamberlain) (Manop Thawornwatsakul, 2004, p. 144) etc., from the nobilities‘s command into the royal direct command and simultaneously increased the number of foreign mercenaries to ensure the royal security. (Manop Thawornwatsakul, 2004, p. 159)

In early 17th century, in the reign of King Prasathong, the royal authority and political stability has been restored. The former vast political influences of the nobilities have been limited. The full authority of state’s civil conscription was also restored into the King’s hand and by the royal decrees of conscription, all of the Prais may collected the rare and expensive stuffs and goods from the jungle as “Suai” (ส่วย) for foreign trading that make abound profit to the royal household. (Warangana Nibhatsukhkij, 2007, p. 131.) The Prais have formerly made abound wealth and political power to the nobilities, now making likewise to the Royal household instead.

If the Prais collected enough content royal tributes or “Suai”. They have been granted the royal seal to show to their Moonnais for abstaining the annual conscription. From then, the Prais could legally collected the “Suai” to sell for their own profit. (Warangana Nibhatsukhkij, 2007, p. 131.) Except some rare and expensive stuffs and goods from the jungle that have been formally registered for the requirement of the foreign traders, they could only sell them to the royal household. In mid 17th century, in the reign of King Narai the Great, if the Prais have enough cash from their own commercing, they could also paid the cash for abstaining the annual conscription in the rate 12 bath per years. (Warangana Nibhatsukhkij, 2007, p. 132.) Moreover, Not only The “Prai luang”, “Prais Som” could also perform their private commerce if they could deal and offer the Moonnais the proper profit. (Warangana Nibhatsukhkij, 2007, p. 133.)

The effects of the glory of maritime foreign trading in 17th century have stimulated interior commerce of the Kingdom of Ayutthaya, strengthen the royal authority and established the new class of the Prais, the “Kradumpi” (กระฎุมพี : The Ayutthayan bourgeoisie”.

Roles and Significant of the Prais in Ayutthaya’s Military Affairs

Event in the first place, the origin of Prai System has derived from the state’s struggle to control the human resource for the wealth of nobilitities and the royal government. But it is obviously seen that the another main purpose of the origin of the Prai System has derived from the conscription for military purpose in war time. The ability of the royal government to call and conscript the Prais and put them into the combat unit in war time is the important ability of the the royal government to survive and finally win the war.

When the war broke out in the realm, all of the Prais were certainly called and conscripted and transform them all into a military unit ready for battle event they, esspecially the Prai Luang, came from the civil department and never have any skill of combat fighting.

The ability of the royal government to call and conscript the Prais to collect the "Suai" for foreign trading means such ability likewise in war time. There would occasionally be many war in Ayutthayan History that the King himself called and conscripted the Prais making wars for increasing his own commercial profit. Such as during 1659 – 1663 AD in the reign of King Narai the Great. He has declared the war on Lanna Region, Kingdom of Lanchang and many of southern Burmese and Mon towns for spreading the Ayutthayan political influences to control the collecting site of natural resources supply for foreign trading. (Manop Thawornwatsakul, 2004, p. 262) This war was not merely made for the royal economical purpose but for indicating and also threatening the challenging nobilities the strong ability of royal government for calling and conscripting the Prais for serve the royal will and project and such ability of the of Ayutthayan royal government made them can confidentially waging the long lasting war in the foreign region far away from their core area of power in lower Chaopraya Basin without no fear of the nobilities's uprising. (Manop Thawornwatsakul, 2004, p. 263). But vice versa, in late 17th century, the political roles and influences of the close royal officers that control the Prais for the King have gradually increased and then challenging the royal power. They, the close royal officers, have expanded their power into many provincial officers that theoretically were an impermanent position granted according by the royal will but the permanent lifelong position that can also could be inherited to direct descendants. (Sunait Chutintharanond, 1990, p. 93.)

In this plight of political instability, King Narai the Great has obviously awared and made his distrusting counter policy against his dishonest royal officers and also replaced them with the honest foreign civil officers and mercenaries. King Narai the Great has achieved to create the new network of foreign nobilities for ensuring and also supporting the royal authority and he, the King, has gradually transferred the wealth and ,of course, the ability to control the Prais to his new network of foreign nobilities.

The former indigenous network of nobilities, led by "Ocpra Petraja" (ออกพระเพทราชา : Director General of Department of Royal Elephants Services), were certainly furious by this splendid royal movement and increasing more wealth and political influences challenging the royal authority and the King himself has clearly known of this fatal message, so he has declared his decree to the royal government to call and conscript the Prais for waging his long war, showing them, The indigenous network of nobilities, the power of the royal government conducted and protected by the honest foreign civil officers and mercenaries. (Warangana Nibhatsukhkij, 2007, p. 84.)

Besides that, the another splendid royal movement against the indigenous network of nobilities was to increase combat potentiality of the Prais in the royal military department, directed to the royal authority. In 1685, King Narai the Great has received a military technocrat from the King of France. So the King has set him the new department contained with 400 of Prais (increasing the number to 800 of Prais later) and commanded him to train these Prais in modern western firearm tactic and military combat,so the King might use them as his personal armed force to protect city of Bangkok and Lopburi. All of these Prais in this mentioned department had no salary or any kind of payment but the seal for abstaining the annual state's civil conscription has been granted and given for them instead. (La Loubere, Simon de, 2009, p. 276.) By this modern western firearm force made the King could easily gain the upper hand over the old traditional style of edge weapon farmer conscripted armed force, controlled by the indigenous network of nobilities. (La Loubere, Simon de, 2009, p. 276.)

Event King Narai the Great has deployed his splendid royal movement for securing his power, but he has finally been overthrown by the outnumber armed force led by "Ocpra Petraja" in 1688. The new King and dynasty have simultaneously proclaimed by "Ocpra Petraja". When he has gained the political power, he has eliminated the former network of foreign nobilities and restored both the central and provincial political power of indigenous network of nobilities. Shortly after the new reign of King Petraja, the political situation in Ayutthaya has once again turned into another fetal political turmoil because of the political power of indigenous nobilities, based on the weath and ability to control the Prais , have rapidly increased and then challenging among themselves. This controversy has expanded into the fierce civil war, led by two Princes supporting by two distinct group of nobilities, in 1733.

The Prai system or State's civil conscription has declined because of the expanding of western maritime trading in 17th century and the Chinese maritime trading in 18th century. Many of Prais have taken advantage of this situation to make their own private trading and commerce. Paying for their own freedom of state's conscripted abstaining and collecting their profit and wealth to pleased and even challenge the Moonnais of old regime as the weathy Prais or "Kradumpi" ("กระฎุมพี") . The Prai system still gradually declined until the end of Ayutthaya's period and when the war with Burmese King broke out in 1766, the unfavorable effect of this declined has reveal itself. The royal government of Ayutthaya has failed to call and conscript their own citizen to set and fill in military units fighting against the far outnumber enemy (Warangana Nibhatsukhkij, 2007, p. 133.) and most of the Ayutthayan experienced military personnel have died in the recent civil war. So by these reason, the Kingdom of Ayutthaya has been defeated and destroyed in Aril, 1767.

Conclusion

From late 15th century, The Prai system or State's civil conscription has established as the economical basis and military stability of the Kingdom of Ayutthaya. The Prais played the important role for both affairs for centuries, before declined in late 17 century by the cause of foreign maritime trading growth and this decline also was one the major cause of the collapse of the Kingdom of Ayutthaya.

The great challenge of the ruler in Thonburi and early Rattanakosin period is How to maintain the conscripted efficiency of the Prais system along with the foreign maritime trading growth ?

For the solution of this problem, In Thonburi period has trengtened the the conscripted efficiency of Prais system by upgrading into "The Tattooed conscription". All of the Prais ,registered in every state's department, in Thonburi period have to be tattooed their own Moonnai's name, resident's Location and name of the town that the Prais have registered at the wrist. It's the simple way to help the state officer to find out and identify the Prais who have avoid the State's civil conscription.

Moreover, the Thonburi royal government has declared that the mumber of "Prai Som" have to be immediately reduced. If the Moonnais have pass aways all of the possessed "Prai Som" have to be return to the Thonburi royal government and reregistered as "Prai Luang" (Akin Rapeepat, 2017, p. 36.) and from now on, both "Prai Luang" and "Prai Som"have to be sililarly conscripted but the Thonburi royal government has reduced the time to serve as annual conscription from 6 to 4 months per year for encouraging the Prais for farming more crops or event start their own commerce.

In Rattanakosin period, "The Tattooed conscription" was still functioned. But in the state requirement of cash, especially silver coin of ingot, the Rattanakosin royal government has once again reduced the time to serve as annual conscription from 4 to 3 months per year and prefered to accept cash as the abstaining conscripted payment (ส่วยเงิน) more than free laboring. Because of the new currency in 19th century industrialized trading required only silver coin of ingot as the international currency intermediation. (Warangana Nibhatsukhkij, 2007, p. 133.) Furthermore, The Chinese migration to Siam after the end of the Opium war (1842 AD) has served enough the inexpensive and effective laboring supply to the Rattanakosin royal government. There would be no more the desire for indigenous civil labouring conscription.

But Notwithstanding, "The Tattooed conscription" in Rattanakosin period was not vanished, vice versa, It was still functioned because of the purpose of war against both Burmar and Vietnamese force. When the new reign have come or in the war time, the Rattanakosin royal government has sent "The Tattooed conscription commissioner" to travel throughout the Kingdom for surveying, checking and registering the new Prais, got ready for another military conscription that might be occur in the near future. (Dhibhakorawongse Mahakosadhibodi, 1995, p. 9.)

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The motivational constructs of students in higher educational institutions during the Covid-19 pandemic in Davao city

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Abstract

The study aims to identify the motivational constructs of students enrolled in higher educational institutions (HEIs) for pursuing education amidst the pandemic and to recommend university strategies of developing students' motivation for education. There were 400 responses from university students in Davao City administered through a 30-item survey questionnaire. The responses were tabulated, analyzed, and interpreted using data reduction techniques. The rotated component matrix of the exploratory factor analysis revealed six constructs that indicate the motivation of students in the implementation of the pandemic learning mode. These include personal interest, career growth, teacher's supervision, interpersonal recognition, technical efficiency, and emotional resilience. Based on the findings, these constructs had influenced the participants' decision of pursuing tertiary education amidst the COVID-19 pandemic.

Keywords: education, factor analysis, motivational constructs, pandemic learning mode, students, university

Background and significance of the study

Almost two years since the first reported case of the then-novel coronavirus (NCoV-19) in Wuhan, China, COVID-19 is now nearing 119 million reported cases and almost 3 million deaths across the globe (World Health Organization, 2021). This health crisis rendered life in disarray, significantly the education system at all levels.

Universities were the first to further efforts to isolate and decelerate local transmissions through implementing varying learning management systems depending on the intensity of COVID-19 preventive protocols per country (Sahu, 2020; Shahzad et al., 2020). On the inception

of the pandemic, some universities in Germany were able to postpone the supposed start of their summer classes depending on their disparate academic calendars. The University of Italy had postponed classes as early as the first week of March. Universities of France and Spain have closed until further notice. Austria and Belgium resorted to remote learning. United States, Netherlands, Sweden, United Kingdom, among many others, conducted and retained blended learning (Study.eu, 2020).

In the Philippines, notable Higher Education Institutions (HEIs) administered guidelines for no disruption of classes amid health crises. De La Salle University (DLSU) resorted to remote pandemic learning mode. Ateneo de Manila University (AdMU) put synchronous classes on hold and had fully asynchronous learning. University of Santo Tomas (UST) conducted both synchronous and asynchronous classes with a revised grading system. Private tertiary education institutions such as Far Eastern University (FEU), University of the East, Adamson University, and Ateneo de Davao University (AdDU), among others, transitioned to online classes (Joaquin, Biana, & Dacela, 2020).

Similarly, universities in Davao City like Lyceum of the Philippines Davao (LPU), Malayan Colleges of Mindanao (MCM), and University of Mindanao (UM), which had experienced blended learning before the pandemic, transitioned to online classes (Lyceum of the Philippines, 2020; Malayan Colleges Mindanao, 2020; Francisco, 2020). Ateneo de Davao University (AdDU), University of Southeastern Philippines, and University of the Philippines Mindanao (UP Mindanao) implemented remote learning (Edge Davao, 2020; Estremera, 2020).

All these universities had a flexible course delivery depending on students' and teachers' needs, giving the option of participating in synchronous sessions or opting for a fully asynchronous academic year. The number of units required for a new semester was also minimized for students who could not enroll in subjects beyond their financial, mental, and emotional capacity. Even the universities in Davao, like AdDU, UP Mindanao, and UM, also established a more lenient grading system to cater to several factors that affected students' motivation and availability to pursue education.

As of the date of conduct, most studies sought to elaborate on the effects of the pandemic in university instructions and tertiary education in general (e.g. Pasion et al., 2020; Marzoli et al., 2021; Alomyan, 2021). Others tried to enumerate the adverse effects of online learning and the challenges of the new normal education experienced by university administrations, faculty staff, parents, and teachers (e.g. Simamora, 2020; Ramayah & Kumar, 2020; Joseph et al., 2021). Although few studies explored further the effects of pandemic learning on students' motivations, engagement, and perceptions, (e.g. Paison et al, 2020; Daniels, et al., 2021) there is clearly a need to pinpoint specific motivational constructs, or the absence, that have urged or sparked disinterest for enrolling during the peak of COVID-19 cases.

Rosenberg & Ranellucci (2017) and Selim (2007) reported that one key factor in determining the success of e-learning or blended classes, in particular, is the motivation of students for the scholarship. Psychology defines motivation as the force that drives one to act or do something (Keskin & Yurdugül, 2020). Soledad et al. (n.d.) said that learners' motivation can be a great barrier to the pandemic learning mode and result in the inability of professors and institutions to foster deep learning. They also mentioned that these factors had affected the drop-out rates during the conduct of their study.

Several interplaying factors have a prominent role in the students' motivation during the transition phase and initial phase of blended learning, such as but not limited to, the availability of resources (budget, gadget, connectivity, space), capability to navigate in e-learning (stock knowledge on digital materials), other responsibilities (household chores, watching over younger siblings, helping in small businesses, working), and even effort to fight COVID-19 (quarantine measures such as isolation) (Baticulon et al., 2021; Lopez, 2021; Williams, 2020). Students were either disabled or sustained depending on the severity of these possible limiting factors' negative or positive influence on their transitioning phase that became more concrete and perpetual during the initial months of the pandemic learning mode.

Although reports indicate that enrollment across Davao Region plummeted after the first few months of lockdown (Lemit, 2020), there are still many students enrolled in universities across Davao City. This means that a good number of students have either a strong motivation, weak motivation, or lack of motivation but are driven by other factors to continue where the semester left off or start anew with the reconstructed academic calendars and learning management.

Research objective

This study will mainly identify the motivational constructs among students of Higher Educational Institutions in Davao City, Philippines during the COVID-19 pandemic.

Research hypothesis

There are motivational constructs of students currently enrolled in higher educational institutions (HEIs) for pursuing education amidst the pandemic.

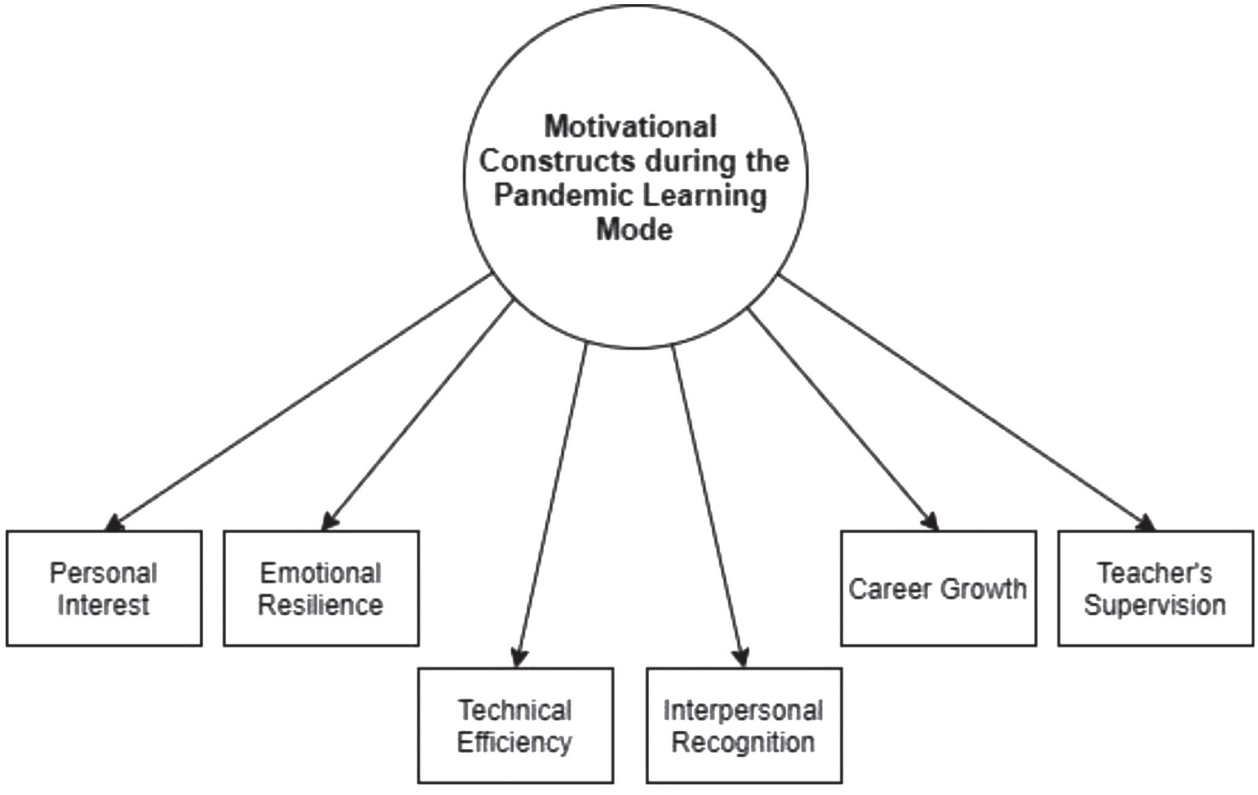

Figure 1 The conceptual framework of the study

Conceptual framework

Figure 1 below presents the conceptual framework of motivational constructs before the factor analysis is completed. Indicated in the figure, a total of six perceived motivational factors (personal interest, career growth, teacher's supervision, interpersonal recognition, technical efficiency, and emotional resilience) and will be reduced into an appropriate number of constructs (depending on the result of the factor analysis). Also, figure 1 indicates the motivational factors to be analyzed in the study.

Research methodology

Method used

This study used explanatory research design through quantitative non-experimental approaches to identify the fundamental constructs that motivate students in a pandemic learning mode setup. According to Kabir (2016), an exploratory design is best employed when there are few or no earlier studies to benchmark to predict an outcome. Furthermore, the design is intended to provide the researcher with a wider perspective on the situation being developed, as well as new ideas and assumptions.

Sources of data.

The motivational constructs of the students were obtained through a survey, the simplest and the most commonly used method in social sciences, management, marketing, and psychology to some extent by obtaining large volumes of data that can be analyzed for frequencies, averages, and patterns (McCombes, 2020).

Data gathering instrument

Survey questionnaires in a Likert scale were used in this study to determine the university students' motivational constructs through online and blended learning. The Likert scale survey questionnaire is a five- or seven-point scale which allows individuals to express how much they agree or disagree with a particular statement (Mcleod, 2018). It is intended to assess respondents' behaviors, beliefs, or expectations and choose from the arranged set of possible responses - strongly agree, agree, neutral, disagree, or strongly disagree, to a particular questioner (Wu & Leung, 2017).

Structured survey questionnaires were utilized as a research instrument for the study. The survey questions are based on the studies of Fowler (2007), Kim and Frick (2011), Nielsen (2018), Russell (2013), Smith et al. (2008), and Smith and Onencan (2020). The questionnaire was edited to meet the current setting of the respondents and achieve the conditions of the study. The survey, containing 30 questions, will be used to gather the needed data better to analyze it in a short time.

Sampling technique

The study was limited to university students in Davao City who are currently enrolled in a pandemic learning mode which can be susceptible to selection bias; hence, random sampling will identify and select the respondents for this study. Slovin's formula was used to get the sample size of the study, to take into account confidence levels and margins of error (Ellen, 2020). The survey was administered to 380 respondents with a 5% margin of error from the total number of enrolled students in all HEIs in Davao City for A.Y. 2020 - 2021 with a total population of 87, 912 as obtained from the data provided by the Commission on Higher Education (CHED). Moreover, the sample size does not change much for populations larger than 10,000 (Fairbairn & Kessle, 2015).

Validation of tools

Before gathering the data, the prepared survey questionnaire and informed consent were validated by three experts in the field of education and.

Data collection

Due to the limited mobility of both the researcher and the respondents, survey questionnaires were administered online through Google forms. Prior to data collection, the respondents must sign the informed consents, which can be seen in the first part of the questionnaires, indicating that their participation is voluntary and non-compulsory. The respondents' information and answers were kept confidential, and responses will be recorded for research purposes only.

Reliability test

The survey data were then subjected through a reliability test using Cronbach Alpha Analysis. Cronbach's alpha is a measure of internal consistency, or how closely a group of variables is related to one another. It's a scale reliability parameter. It must be greater than 0.6, which is the acceptable level for this test. This also assesses the research instrument's validity and reliability (Goforth, 2015).

Table 1 Reliability statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.917	.918	30

The results of the reliability test shown in Table 1 indicates that the data gathered from the respondents are reliable and have a high level of internal consistency with a Cronbach's alpha of 0.917.

Statistical treatment

Data Reduction Analysis. This tool was used to identify the thriving mechanisms of microenterprises amid the pandemic. Principal Component Analysis (PCA) was used as the data reduction technique in this study to obtain factors that summarize the information available in the dataset to the greatest extent possible. This was used to condense a large dataset with a large number of variables into a more manageable size.

The Keiser Meyer Olkin (KMO) measure of sampling adequacy was used to test the magnitude of partial correlation among the identified constructs and determine whether the data can be used for factor analysis. Bartlett's test of sphericity was also used in this study to determine whether the correlation is an identity matrix or not and to identify which items in the questionnaire are significantly suitable for categorizing and extracting the factors that determine the underlying constructs.

Varimax with Kaiser Normalization was employed to categorize the number of items that fit the standard rule assumptions in factor analysis and group them into a specific number of constructs based on the criterion for the Eigenvalues of the components subjected for factor analysis.

Research findings

Factor analysis

This section presents the results of KMO and Bartlett's Test and Principal Component Analysis. The derivation of the number of factor structures and rotated matrix of the model is also presented using Varimax with Kaiser Normalization.

Table 2 Kaiser-Meyer-Olkin measure and Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.893
Barlett's Test of Sphericity	Approx. Chi-Square	6769.116
	df	435
	Sig.	.000

KMO and Bartlett's Test. To ensure that the construct can be tested for factor analysis, the Kaiser Meyer-Olkin Measure (KMO) of Sampling Adequacy and Bartlett's test of sphericity was performed. It can be gleaned in Table 2 that the KMO value is .893, which is above the recommended value of .5, indicating that the sample is meritorious and adequate for factor analysis. The magnitudes of observed correlation coefficients are compared to the magnitudes of partial correlation coefficients using the KMO sampling adequacy measure. Other variables can explain correlations between pairs of variables if the KMO value is large enough. Factor analysis cannot be performed if the KMO value is below 0.5 (Chan & Idris, 2017).

Meanwhile, Bartlett's test was performed to check if there is a certain redundancy between the variables that can be summarized with a few numbers of factors. The results revealed that the p-value is significant ($p<.05$), indicating that the data have patterned relationships, and factorability is assumed (Abdrbo et al., 2010). The correlation matrix is assumed to be factorable if the Kaiser Meyer-Olkin (KMO) is larger than 0.5 and Bartlett's Test of Sphericity (BTS) is significant at $\alpha < .05$. To put it another way, the KMO and BTS tests evaluate whether the sampling was sufficient to proceed with factor analysis (Maat, Zakaria, Nordin, & Meerah, 2011).

As shown in the preliminary analysis, it can be generalized that the items in the tool are suitable and adequate for the extraction of factors and thus ready for factor analysis.

Table 3 Total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.006	30.019	30.019	9.006	30.019	30.019	3.966	13.220	13.220
2	3.538	11.795	41.814	3.538	11.795	41.814	3.693	12.308	25.529
3	2.571	8.569	50.384	2.571	8.569	50.384	3.533	11.778	37.306
4	2.044	6.814	57.197	2.044	6.814	57.197	3.073	10.245	47.551
5	1.509	5.030	62.227	1.509	5.030	62.227	3.005	10.016	57.567
6	1.199	3.997	66.223	1.199	3.997	66.223	2.597	8.656	66.223
7	.934	3.114	69.337						
8	.773	2.577	71.914						
9	.659	2.198	74.112						
10	.619	2.062	76.174						
11	.583	1.945	78.118						
12	.570	1.901	80.019						
13	.543	1.809	81.828						

Extraction Method: Principal Component Analysis.

Derivation of the Number of Factor Structure and Total Variance Explained. The derivation of factor structure was determined through the eigenvalues of the components. As a rule of thumb, components are selected whose Eigenvalue is at least 1. Table 3 presents the number of constructs extracted, initial Eigenvalues associated with the specified constructs, the percentage of the total variance, and the cumulative percentage of each construct. After utilizing the criterion for Eigenvalue, the 30 items of the scale seem to measure six underlying factors because the first six components have an Eigenvalue of at least 1. The six underlying factors are the motivational constructs of students in higher educational institutions during the covid-19 pandemic in Davao City.

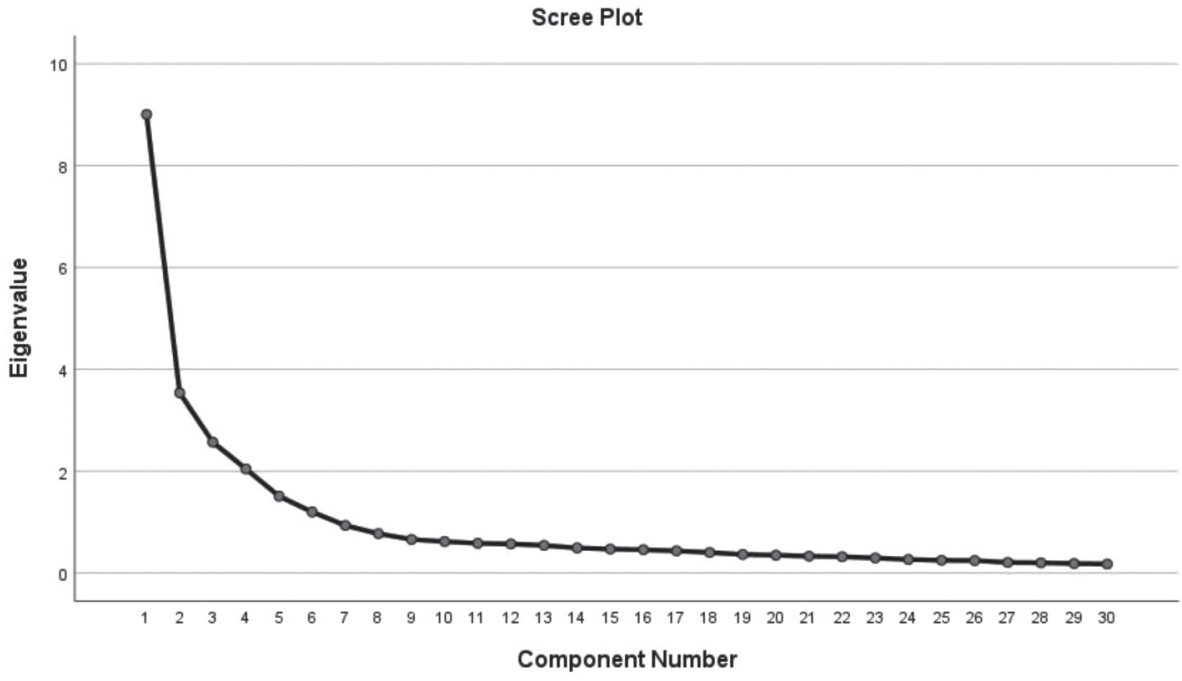

Figure 2 The number of the factor versus its corresponding Eigenvalue

To further fortify the results of the previous table, Figure 2 presents the scree plot, which displays the number of the factor versus its corresponding Eigenvalue. The scree plot shows that the first five factors account for most of the total variability in data (given by the Eigenvalues). The Eigenvalues for the first five factors as presented are all greater than 1. The remaining factors account for a very small proportion of the variability and are likely unimportant.

Table 4 Rotated component matrix

	Component					
Items	1	2	3	4	5	6
i2	0.8					
i1	0.776					
i4	0.761					
i3	0.756					
i5	0.712					
i11						
i29		0.824				
i27		0.8				
i28		0.792				
i30		0.774				
i26		0.743				
i23			0.802			
i24			0.799			
i22			0.784			
i25			0.758			
i21			0.726			
i19				0.818		
i18				0.745		
i17				0.678		
i16				0.665		
i20				0.616		
i10					0.78	
i9					0.772	
i7					0.679	
i8					0.655	
i6						
i13						0.757
i15						0.721
i12						0.69
i14						0.614

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

Rotated Component Matrix. After identifying the number of factor structures, the 30-item construct is then subjected to rotation. Table 4 shows the pattern matrix using Principal Component Analysis with a rotation method of Varimax with Kaiser Normalization. According to the standard rule of factor analysis, items with a loading value of less than .60 should be excluded. Additionally, since the matrix does not need to be scanned to recognize substantive loadings, eliminating communalities less than .60 and arranging variables by loading size would make it easier to interpret (Field, 2005).

As observed in Table 4, Item 6 and Item 11 have a loading coefficient below 0.60. These items which have faced validity issues and low communalities are removed in the model. The factor contributes more to the variable if the absolute value of the loading is higher (Chetty, 2015). The components in the model that make no sense and are not relevant to the factor can be deleted. Also, the researcher can use loading coefficients to pick only those items that best represent the factor, and items with low coefficients may be excluded from the factor structure (Hair et al., 2010). Moreover, Field (2005) claims that suppressing commonalities (or the proportion of each variable's variance that the factors can explain) less than .60 and ranking variables by loading size will make interpretation easier because substantive loadings will not need to be checked.

Furthermore, it can be observed in the table that there is no item cross-loading or not loading at all, which means that the items best represent their factors. Hair et al. (2010) emphasize the importance of loadings in determining the degree of correspondence between a variable and a factor, with higher loadings indicating that the variable is representational of the factor.

Rotated component matrix with grouped items

Based on the criterion, a total of 28 items were categorized into six constructs, namely:

Personal interest. Table 5 shows items that point towards the obvious effect of learners' internal motivations to pursue education through online learning. Gustiani (2020) describes internal or intrinsic motivations as related to one's "motivation to learn and gain new knowledge such as happiness in learning new things" and is widely affected by how they take on personal or academic challenges that come with facing their ambition, inspiration, competency, and even physical conditions.

Their enthusiasm, or the lack thereof, is seen to affect how they decided to enroll in a higher education institution amidst the onset of the health crisis. Thus, the clear emergence of the construct. Aside from their interest in studying, Mandigo & Holt (2000) suggest that students' interest value in education is stimulated when they are given enough control, choice, perceived competence, and task-involved activities. They found out that giving the students choice in their workloads helped them reach enough level of control that later on affected their motivation.We can

then assume that this personal interest has an even greater impact on the learners' motivation when better circumstances to express and exercise their intrinsic goals and ambitions without hindrances arise.

Table 5 Rotated component matrix with items grouped under personal interest

Item No.	Items	Factor Coefficient	Construct
i2	When I am studying, I feel completely absorbed by what certain authors have written.	0.800	Personal Interest
i1	I study because I experience pleasure and satisfaction while learning new things.	0.776	
i4	I study for the pleasure that I experience in broadening my knowledge about subjects that appeal to me.	0.761	
i3	I study online because I appreciate this task as interesting.	0.756	
i5	I study because the university allows me to experience personal satisfaction in my quest for excellence in my studies.	0.712	

*Emotional resilience***.** Assessing the presented data, emotional resilience is also another significant motivational construct of students enrolled in universities during this pandemic. The pandemic decreased students' exposure to their studies and competencies, affecting their emotional, mental health as they deal with its corresponding consequences (Li et al., 2020). The effect will be particularly strong on those students who can't adapt and cope easily with the situation. According to Save the Children (2020), this effect is influenced by the loss of competencies and knowledge, difficulty in learning individually, individualizing, loss of interest in learning, and lack of direct assistance from teachers. Furthermore, individuals ranging from 18 to 30 years old are at a point in their lives where they successfully attained intimacy or detached themselves from others. In the pandemic, sudden adjustments affected their physical and psychological well-being, contributing to psychosocial stress (Wang et al., 2019).

Various studies have examined the effect of adverse circumstances on the academic development of students. Consequently, individual fulfillment, study environment, and individual relations among educators and students are some factors influencing their academic performance (Dornela, Falcoski, Monteiro, Versuti, Padoven-Neto, 2021). Based on the study of Quintiliani et al. (2021), the following troubles relate to the emotional stress of students: adjusting

to the new environment, maintaining attention during class, performing assessments, coping up with extreme pressure, and stressing over academic performance. Also, Zhou and Zhang (2021) indicated that the lack of interaction between educators and classmates contributes greatly to students' emotional well-being in their learning performance.

Table 6 Rotated component matrix with items grouped under emotional resilience

Item No.	Items	Factor Coefficient	Construct
i29	I do not have a hard time making it through stressful events.	0.824	Emotional Resilience
i27	I can always cope up with all the things that I can do.	0.800	
i28	I am always confident about my ability to handle my academic problems.	0.792	
i30	I tend to take a short time to get over setbacks in my life.	0.774	
i26	I do not feel anxious or frustrated when I have to take tests or quizzes in this course.	0.743	

Technical efficiency. The findings indicate that technical efficiency is a significant motivational construct for students enrolled in higher educational institutions during this pandemic. The ability of students to adapt and navigate to the online platform affects how they stimulate themselves to learn. Working with the new requirements of the new platform required students to assess their confidence in terms of technical skills. With this, it is essential to consider the students' capability and skills as they continue to learn in the online environment.

Several studies have demonstrated that advances in regard to data innovation and the development of personal computers emphatically influence the methodology of college students on learning in a contemporary educational environment (Apuke & Iyendo, 2018). Cell phones and simple web access have changed the worldview of correspondence with regards to the educational system. Social networks utilized in regular day-to-day existence can achieve changes in showing techniques and produce upgrades by engrossing students, including their learning technique (Santos & Batista, 2019).

The sudden demand for switching to online learning during the pandemic had adverse effects on university and high school students (Farrington, 2020). Due to this, students' ability to adapt to the new environment was compromised, including their access to technology (UNESCO, n.d.). The study of Butnaru, Niță, Anichiti, and Brînză (2021), students who can easily browse the internet consider online learning effective, which supported the result of the study. Similarly, the

usage of electronic educational resources lowers the motivation of students. Reasons for lower learning effectiveness include users' doubts about educational services, lack of comprehension of the learning materials, and unavailability of control from the teachers (Rudaleva, Kabasheva, & Kovaleva, 2016).

Table 7 Rotated component matrix with items grouped under technical efficiency

	Items	Factor Coefficient	Construct
i23	I have no trouble navigating the technical difficulties that I encountered during an online class.	.802	Technical Efficiency
i24	I believe I have enough technical skills to be successful in the pandemic learning mode setup.	.799	
i22	I can use appropriate digital technologies that allow me to express my opinions and interact with other colleagues or students.	.784	
i25	I am certain I can master the technological skills needed in class.	.758	
i21	I can easily navigate through our course website.	.726	

Interpersonal recognition. Evaluating the results, interpersonal recognition is a significant motivational construct of students enrolled in higher educational institutions during this pandemic. Positive recognition influences a youngster's feelings, with more good relational connections with peers prompting lower levels of depression and inconvenient feelings (Zimmer-Gembeck, Hunter, & Pronk, 2007). Self-efficacy is impacted by outer social situations and relational interactions. Students can foster self-efficacy through peer learning, and this effective learning experience furnishes students positively. In this manner, acknowledgment from friends and educators, and self-efficacy promote a well-developed character influence and environment (Su, 2015).

Besides, relatedness is an important self-system process, according to Furrer and Skinner (2003). Accordingly, many studies relating to academic achievement take as a beginning stage that it is students' liability to foster a scholarly identity by which personality advancement is dependent on their commitment, association, and motivation (Pascarella & Terenzini, 2005). Besides, Honneth (2006) believes that the actions given in response to recognition are more significant than being aware of a person's merits. He argued that genuine acknowledgment is the facilitator that upholds the improvement of a character. Thus, achieving the feeling of character from others through their acknowledgment builds an individual's identity.Students still need appreciation

and acknowledgment from the people they do care about the most. Additionally, students may see performance-oriented situations in which they build positive relationships as being encouraging in their pursuit of success.

Achievement motivation may be facilitated and sustained in the environment of a performance orientation (Martin & Dawson, 2009). Moreover, this result is supported by the goal theory, which focuses on the importance students attach to performance situations and the purpose of their actions. Social goals focus on reasons of social achievement, like belonging and gaining approval from others (such as parents and peers), and adhering to group norms (Dowson & McInerney, 2003).

Table 8 Rotated component matrix with items grouped under interpersonal recognition

Item No.	Items	Factor Coefficient	Construct
i19	I like to receive regular praise and recognition for my outputs from my parents and teachers.	.818	Interpersonal Recognition
i18	I am looking forward to receiving rewards from my family whenever I get high grades.	.745	
i17	Getting a good grade in my class is the most satisfying thing for me right now.	.678	
i16	I want to do well in my class because it is important to show my ability to my family, friends, employer, or others.	.665	
i20	I study hard to get good grades in return.	.616	

Career growth. These items are founded on students' career-related goals in the pursuit of tertiary education, thereby implying that the respondents have still pursued education amidst the COVID-19 pandemic in the hopes of getting equipped for the corporate world, whether or not they have already identified their career orientation, and landing on better jobs to help have a better life.

Regardless of gender, participants had exhibited the influence of career planning in their motivation for learning because of their urge to do better in the future. The desire for career growth also encompasses their possible change of career in the future, in light of knowing more about their degree programs and what opportunities it offers. This findings suggest that the value-related (e.g., the usefulness of their career in society and possible performance as an engineer in the future) and expectancy-related (e.g., achievement or success rate) constructs could be predictors of the student's career plans (Jones et al., 2010).

This goes to show that students' point of view on assessing their career growth through, or not, the course they have enrolled in affected their will to study even with socio-economic and physiological barriers.

Table 9 Rotated component matrix with items grouped under career growth

Item No.	Items	Factor Coefficient	Construct
i10	I study in order to receive more job opportunities later on.	.780	Career Growth
i9	I study because I want to have a 'good life' later on.	.772	
i7	I understand that studying will help me make a better choice regarding my career orientation.	.679	
i8	I believe that a few additional years of education will improve my competence as a worker.	.655	

Teachers' supervision. This means that the presence or absence of teaching professionals during real-time lectures or their availability in the light of asynchronous activities impacts their learners' drive to continue studying.

In a similar study by Dhingra et al. (2021), 28.6% of the undergraduate medical participants agreed that they had ample time to understand lessons during or after their synchronous classes when their teachers were there to respond and this has helped them adapt to online learning. On the other hand, the majority of them also agreed that there is still room for improvement in the aspect of module making, online and offline activities, and content relation to further inspire learners' desire to learn and participate.

Moreover, students' motivation is also affected by the supervision of their guardians or teachers. In fact, in the study of Yilmaz et al. (2017), they found out that the teacher's classroom management skills had a big influence on a student's willingness to continue learning. However, they found out that students were affected more by the teaching skills of the teacher and the way he managed the class and their school works compared to their parents' supervision. In other words, teachers have a crucial role in developing, enhancing, and strengthening students' motivation in learning, especially those directly hit with the health crisis. Their communication of information, delivery of lessons, and hands-on guidance and feedback on activities and outputs comprise the construct that focuses on teachers' positive or negative students' motivation.

Table 10 Rotated component matrix with items grouped under teacher's supervision

Item No.	Items	Factor Coefficient	Construct
i13	I wanted to get answers to my questions from an instructor.	.757	Teacher's Supervision
i15	I understand lessons when I interact with my teachers rather than learning on my own in an online course.	.721	
i12	Support from my teacher is important to me in learning.	.690	
i14	I participate more in our class discussions whenever my teacher is around.	.614	

Recommendations

By these findings, the researcher would recommend that the students self-assess their interests before enrolling in a course. Moreover, students are highly encouraged to explore their desired career to be on the internet for them to be knowledgeable enough and evaluate whether or not the course they will be taking is something they want.

Additionally, one of the alarming issues in this online learning is teachers' instructional pacing and giving feedback on the students' output on time. The pacing of the topics contributes to how the students can cope since not all students have the same ability period to process the topics. Punctual and precise feedback on students' outputs must be required in every HEIs to allow students to assess themselves how well they are doing.

Furthermore, the professors' desire to teach and not the obligation to teach is also a massive factor in students' motivation to continue studying. Despite the stress caused by this unfamiliar platform, they are presumed to support and acknowledge their students.

On the other hand, internet connection is one of the most vital requirements in pursuing education in this pandemic. Installing free wifi to every barangay accessible to students at a specific time can help the students do their tasks without worrying about internet connectivity.

Succeedingly, HEIs are also expected to do technical efficiency webinars with their faculty members as well as students so they are well informed on using their LMS. In addition, the Commission on Higher Education must develop mechanisms to encourage constant collaboration between HEIs and the students' parents, to increase awareness and literacy on how recognition is essential to their children. The HEIs can do this during semestral general meetings through an online platform (Zoom, Google Meet, or Facebook Live).

A learner's emotional resilience also dramatically impacts their motivation to study. Hence, the need for more intensive programs concerning the students' mental health aside from webinars and symposiums. The education sector should also work hand in hand with mental health professionals for this actualization.

Stress management seminars are also ideal programs to incorporate into the educational system. This is to ensure that the students, even the educators, can handle stressful situations, especially during the pandemic.

Lastly, a broader scope of the study would be best for exploring other motivational constructs and further strategizing effective academic instructional methods, assessments, and university activities to keep students' learning at par with the status quo without putting their well-being at risk.

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The social innovation from Java's villagers to handle COVID-19 impact in the digital era

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Abstract

Social assistance from the government tends to mitigate the impact of COVID-19 and may give rise to dependence. The purpose of the study is to find out how villagers deal with COVID-19 enabled social innovation. More than 200 people participated in the survey. Wonosobo Regency was chosen for the study because it is one of the most impoverished areas in the country and has several villages that are considered to have a high level of poverty. The research conducted case studies in two villages. The basis for choosing this village is that the two villages bring out new things in managing their development. The research found that villagers who work as international migrant workers can become agents of social innovation. They established a new mechanism for handling the impact of COVID-19 that provided social assistance but also encouraged economic recovery through the strengthening of the economy of the village of origin. These processes can be developed because they are both economic and social. The ability to use the internet network to communicate, develop language skills, and collaborate with various parties makes home villages able to deal with the impact of COVID-19. The two research sites where the study was conducted had social innovation from the grass-roots. It is useful as a means of restoring the business economy because it is a constructive multi-level network governance system involving multi-party cooperation based on internet use in the local government to promote healthy living habits. Villages in Indonesia can continue to develop new things in the post-transitional era of COVID-19.

Keywords: COVID-19, internet utilization, social innovation

Introduction

Maintaining social-economic resilience is important in managing the COVID-19 pandemic. The health problems that have occurred because of the pandemic have affected the world and national economies. There are 216 countries out of 241 countries (89.6%) in the world that are facing the spread of COVID-19 (WHO, 2020). The world is facing the spread of COVID-19. The global economy experienced a 3% decline due to COVID-19. The downturn was the worst since the Great Depression.

The problem of unemployment in Indonesia has been worsened by the health problem of the pandemic. The Indonesian economy was ravaged by the COVID epidemic, such that corporations suffered significant losses and micro-businesses went bankrupt (Susilawati et al., 2020). This has a negative effect on the livelihoods of the people who live in cities or villages.

Villages in Indonesia, especially in Java, are facing the COVID-19 Pandemic as they are encouraging social and economic progress. The migration of residents out of the village to work is what characterized the development that took place almost three decades ago. The term "migration" recognizes the departure of residents from the village to work in cities in the country and the migration of labor abroad (Kolopaking, L.M., 2000). Villagers who migrate out of the village bring economic and social progress to the village. Those who returned from abroad became agents of change in the village. (Wulan, T.R., 2010; Zid, M., 2012). Those who did not work outside the village had a wider range of social networks. Efforts with diaspora communities in various countries because of their going and returning to the village (Kolopaking, L.M., 2017). When the village experiences internet intervention, this process is further developed (Wahyono, E., 2019).

Migrant workers from villages are prone to transmitting COVID-19 because they are familiar with the contact period. Their return patterns vary (Haas et al., 2016) (Wang and Fan, 2006). Those who return home usually go back to work and then live in their hometown. The sudden return of migrant workers during the COVID-19 pandemic was due to the economy in the country where they worked experiencing an economic downturn. Returning migrant workers are suspected of being a source of the disease. Migrant workers who are prone to attention are also vulnerable to being a source of COVID-19 transmission in village life. Villagers who try to connect with the Diaspora community face the same problem. The villagers need to be able to adapt to the health and economic problems they face so as not to cause a crisis in the village.

The general objective of this research is to reveal social innovation and how Java's villagers are dealing with the COVID-19 pandemic in the digital era. There were two specific objectives: (1) to analyse the use of digital technology when addressing the impact of COVID-19 as a new innovative activity; and (2) to identify how villagers handle the impact of COVID-19 on social innovation.

Literature reviews

Theoretical social innovation in Indonesia's village context

Social innovation is the use of innovative activities to solve social problems (Mulgan, 2006; Warnecke, T., 2017). The activities that are the focus of social innovation are wide. Improving the living conditions of individuals is one example. In the form of poverty reduction; improving the quality of education; providing energy; improving health services; strengthening arts and culture; gender issues; collective countermeasures against the spread of disease and environmental preservation; and overcoming injustice, social innovation can be an innovative and creative activity to overcome community problems (Pol and Ville, 2009; Phills et al., 2008; Mulgan et al., 2007).

The understanding of social innovation is very promising in overcoming increasingly complex social problems. The space for movement for networks of social innovation actors is one of the factors that determine social innovation. There are three factors that determine social innovation, namely: (1) the innovation process as a whole; (2) the space for movement for networks of social innovation actors; and (3) multi-party participation (Neumeier, S., 2016). If you base these 3 factors on reality, then the drivers of social innovation, both as social actors and agencies, become strategic.

The difference between social innovation and non-social innovation is that social innovation has a motivation not only for one's own interests but also a shared prosperity motivated by social spirituality (Miller et al., 2012). These are people who want to improve their communities. The local economy can be developed and become a process of overcoming the poverty of an area with the help of such individuals (Sandeep and Ravishankar, 2015).

Social innovation is influenced by the development of digital technology. Despite the digital divide, an area affected by internet intervention and its community using social media will benefit and encourage innovation (Armando Papa, et. al., 2017). It was found that innovations that use digital technology strengthen the competitiveness of village micro-enterprises (Jaana Räisänen and Tero Tuovinen, 2020). The concept of digital social innovation was developed (Qureshi, Pan, & Zheng, 2017).

The development of social innovation in relation to Indonesian villages is relevant. Since the enactment of Law Number 6 of 2014, the status of villages in Indonesia has changed. The village has the authority to manage its own development. Villages have two different development strategies. The first is "Build Village Approach". Villages are mandated to manage their development so that they can better utilize their local resources for the benefit of their citizens. The second is "Village Building Approach." The village government is encouraged to collaborate with other villages. Development of economic enterprises, construction of social facilities, preservation

of local culture, and repair of damage to natural resources are some of the things that can be done in cooperation. The opportunity for villages to increase the scale of their business is provided by the Village Building Approach. Rural industries can be developed by villages. Villages are given the space to work with various parties from the village, regional, national, and global levels. Increased interaction of village communities to conduct business across national boundaries is related to the villages. Policies for villages can be used to develop social innovation. It is a challenge when the village enters the digital era. The development of social innovation needs to be linked to the development of digital technology.

The reason for social innovation in the digital era is that the use of digital technology in overcoming social problems is still lacking (Qureshi, Pan, & Zheng, 2017; Riaz & Qureshi, 2017). In the context of the development of villages in Java, it becomes interesting to study the daily lives of international migrant workers (IMW), who get convenience in addition to communication with friends and relatives in their home regions, as well as the opportunity to learn to develop themselves and make economic use of them (Parham, A. A., 2004). IMW who work in Japan, Hong Kong, Taiwan, South Korea, and Singapore tend to use cellphones more often (Wahyono, E., et al., 2019; Thompson, E.C., 2009). People who work in Middle Eastern countries get to know their phones better than people who work in Asia-Pacific countries.

A study was done by Septianto et al. (2018). The position of social security within the IMW system is known as an alternative source of funds when the village government lacks a development budget. The IMW community has a political position in the development of the village community of origin.

The process was developed by IMWs who have experience in trading when working abroad. They look for good-quality goods at low prices. These items can be sold online at high prices. Some of the digital media applications they use to sell local products, such as Facebook, WhatsApp, and even some e-commerce platforms such as Shoope, Bukalapak, and Kaskus (Wahyono, 2019),

The use of social media by IMWs is used to build a collaborative network with the Indonesian Diaspora Community to promote local cultural products in the international world. The Indonesian diaspora in the United States supports Indonesian exports. The number of Indonesian diasporas in the United States is approximately 5% of the total diaspora. One of the Indonesian companies has succeeded in marketing typical Indonesian products that are unique, distinctive, pro-local, organic, and of high quality (Indonesia, 2015).

The natural beauty and unique culture of Indonesia can attract both domestic and foreign tourists (US-Trip Green Tourism Kolopaking, 2015). The process becomes an arena for offering more products that are produced, both Indonesian handicrafts and culinary delights with Indonesian

flavors. Green rural tourism, such as ecotourism, agritourism, and marine tourism, has a significant role in regional or regional economic growth. A positive contribution is an increase in state revenue generated from tourist spending and investment encouragement in various sectors so that the effect of tourism contributes to the welfare of the rural community (Dorobantu & Nistoreanu, 2012).

Figures as agency driving social innovation in the digital era: Former IMW

The management of development in Indonesia has been negatively impacted by the COVID-19 Pandemic. The findings of research in villages in China show that the COVID-19 pandemic had a negative impact on the villages in a short time and took place under certain conditions (Li Ganga, Quan Sishic, and Wang Fang, 2002). Village protection and renewal mechanisms give place to culture, which is why the handling of the COVID-19 pandemic in villages is used and developed.

The negative impact on health and psychology can be seen from research in Chinese villages (Mohsin Shafi et al., 2020). Unemployment, life satisfaction, mental health, and the economic prospects of the community were all found to be negatively impacted by the COVID-19 pandemic (Muellera, J.T. et. al., 2021).

The life crisis was caused by the shock caused by COVID-19. The goal is to prevent the crisis from turning into a social disaster. Financial problems are recorded so that all parties pay attention to efforts to detect crises early with an early warning system.

There was a negative impact on the country's economy due to disruptions in the flow of money from migrant workers to their families in South Asia. The welfare of poor families was at risk due to the economic shock caused by the decline in foreign exchange and job opportunities. The events were unprecedented (Henderson, S., Shivakoti, R., 2020). It was found that labor migration could be a cause of the disease. International labor migrants do not have enough knowledge about how to handle COVID-19 (Cheng Wang, et al., 2020). The need to develop social innovation as a system for adequate public health to prevent the spread of COVID-19 has implications (Chanapong Rojanaworara and Sarah El Bouzaidi, 2020). This needs to be done so that the pandemic doesn't cause chaos.

Rescue and recovery can be used to manage the crisis (Haas et al., 2016). The legal umbrella is needed for these two steps in the state. Rescue measures carried out through social safety networks are not in violation of state budget procedures. Steps to recover from a crisis to avoid chaos are important and have a legal basis so that actions can be designed to build social solidarity more systematically.

The funding allocated to deal with the spread of COVID-19 in Indonesia is substantial, with around 405 trillion in the government budget by 2020. The health sector receives approximately 18.5 percent of stimulus funds.Other allocations for economic and social rescue and recovery

account for about 81.5 percent of total funds.The funds allocated to save the industrial sector are also approximately IDR 70 trillion, or 17.3 percent, in the form of tax-free fees and strengthening people's business credit. A further Rp. 110 trillion (27.2%) has been set aside for social safety networking activities.Meanwhile, the amount of money set aside for economic recovery has surpassed IDR 150 trillion, or a 37.0% proportion. However, the government's emphasis on budget allocation may not be appropriate when compared to field practices.

Efforts to deal with the COVID-19 pandemic need social innovation with the characteristics of practice while developing the concept of social innovation itself. Invention is defined differently than innovation. An idea that needs to be accepted as a new thing by certain people is innovation. Cumulative decision-making on a new idea from the discovery stage until it is widely used is the process of innovation in the context of organizational management. According to Setiadi (2017), innovation is an invention related to commercialization or the expansion of the use of inventions for the benefit of society at large.

The potential to develop multi-stakeholder collaborative networks that involve governments, corporations or business institutions, non-governmental organizations, and communities in society can be developed by villagers who become IMW and return to their home areas. This is said to be a social innovation in the framework of social investment (Kolopaking, L.M., 2016). They have an extensive network because they have managed money for business and are proficient in using social media. The development of social innovation in conjunction with the development of communication and information technology can speed up the resolution of problems faced by society. In this regard, it is important to see that social innovation is a new form of innovation besides frugal innovation in economic innovation, which is one of the new managerial skills needed by society 5.0 (Salgues, 2018). The development of technology has led to the integration of physical space and cyberspace. In this society, the role of social innovation is becoming more prominent in creating a new type of society that focuses on science and technology to balance social problems and economic development at the same time.

The reinforcement of social solidarity is included in the development of theories on social innovation. The social investment theory began because of critical discourse on the idea of a welfare state, followed by efforts to track social development funds that needed to be developed as an investment instead of a state expenditure fund. Efforts are being made to develop social entrepreneurship (Volkmann et al., 2012). A series of informal values allow for cooperation between members of a community group. One of the elements discussed in this case is the importance of managing partnerships. Traditional investments were only designed to make money. The search for social factors increases the community of social solidarity behavior.

The governance of social innovation is an extension of the role of government. The government is seen as an institution that works together with other parties in a network to solve problems faced by society, so it is called network governance (Rhodes, 2017). Changing people's or society's views to be ready to change is one of the things that becomes the focus in developing social innovation. There is a need for a new perspective on the activities that make the most money. Local communities and other stakeholders can be involved in the creation of the bridge to the social innovation system (Marso & Savin, 2015).

Social innovation is needed to deal with COVID-19's impact (Fearn-Banks, 2007). The stages in this case are the basis for the content of dialogue and preparation for circles who return to their home villages and villagers associated with the Indonesian Diaspora Community in community units in the village. They will become agents for multi-level governance because of the process. The agent can become a driving force for all stakeholders to work together. People can become social entrepreneurs if they dare to break the system. Social entrepreneurship results in a positive impact on society (Sledzik, 2013).

Research method

This research uses qualitative research supported by quantitative data analysis. The study examines case studies of action research activities (Mohajan, 2018). People who volunteered to complete questionnaires were selected to be part of the study. Field activities began with in-depth interviews with figures who later became collaborators in carrying out research actions and continued with group discussions. Data was collected using online questionnaires from December 20th, 2020, to January 15th, 2021. Wonosobo Regency was chosen as the research site because it is one of the most impoverished areas and has 30 villages (or a percentage of villages) designated as BMI pockets. It was completed by nearly 200 people. They completed an entirely voluntary questionnaire.

This study also included case studies in two villages: Kuripan and Lipursari. The basis for choosing this village is that the two villages bring out new things in managing their development. The in-depth interview involved 3 IMW figures who had settled and no longer worked abroad, and 2 group interviews involving 17 ICW people who had returned home and could be found in the village where they lived. The stable data is analyzed with an interactive model (Miles and Huberman, 2014).

Result and discussion

Handling COVID-19 impact on a community village in Wonosobo regency

Wonosobo is a regency with a relatively small regional income compared to other regencies in Central Java Province. Many villagers working abroad have been strengthened by these developments. There are 29 sub-districts and 236 villages in the area. Most villagers in Wonosobo Regency are familiar with the practice of migrating to work abroad. This regency is known as the most numerous IMW origin area. IMW from villages in Wonosobo Regency travel abroad an average of 2 to 5 times. Migrant workers from Wonosobo primarily seek employment in Asia-Pacific countries such as Japan, Taiwan, Hong Kong, and Korea.

The study is based on research on villagers in Wonosobo Regency that develops social innovations to overcome the impact of COVID-19. The impact of IMW's return is not studied in the framework of international labor migration.

Based on 200 respondents, 13.8% were men and 86.2% were women. They claimed to have mobile phones and had accessed social media before the COVID-19 pandemic. It also found that 80.0% (160 out of 200 respondents) carried out a circular pattern of round-trip labor migration according to employment contracts to countries in Asia Pacific (Singapore, Malaysia, Hong Kong, Taiwan, South Korea, Japan), and Saudi Arabia and the Netherlands. Among the IMW women who claimed to work as maids or care for the elderly, 141 people (87.0% of the 162 respondents) and the rest claimed to work as shop stewards or in factories.

The four highest female IMW-recognized destinations from online processing were Hong Kong (34.6% out of 162 respondents), then Malaysia (22.8%), Singapore (18.5%) and Taiwan (9.9%). From the group interview, it is known that the round-trip pattern of those who work in Malaysia and Singapore is not always due to the expiry of contracts due to the two countries' being close. They can go and leave with the permission of the employer.

Figure 1 shows that IMW who already have a business in the original village are those who tend to have completed employment contracts 3 times. They had managed to become an intermediate layer in the village. From them, this is connectivity with the Indonesian diaspora, to develop economic and business activities in villages in Java. Those going and going home from work are not always to the same country. Some go first to Malaysia, then go home, and then go second to work in Singapore. They were also originally going to work in Singapore, but they went again to work in Hong Kong. However, the impact of the COVID-19 pandemic in the village is most felt by the social layer.

In the context of returns due to the COVID-19 pandemic, there were 128 people (69% of the 188 respondents). Not all IMWs encountered in the research site village in Wonosobo Regency are those who returned home due to the impact of COVID-19. There are IMW who returned home not because of the COVID-19 pandemic but because they were unable to return to work abroad due to lockdown arrangements. The interesting thing then is that 160 people, or 84% of respondents, stated that they still have the desire to continue to work abroad when there is an opportunity for it.

Based on the data collected, 19 people (10.1% of 188 respondents) claimed to have contracted COVID-19 and recovered. In the interview with IMW, they felt the hardest thing when contracting COVID-19 was to bear the feeling of being an "eliminated person".

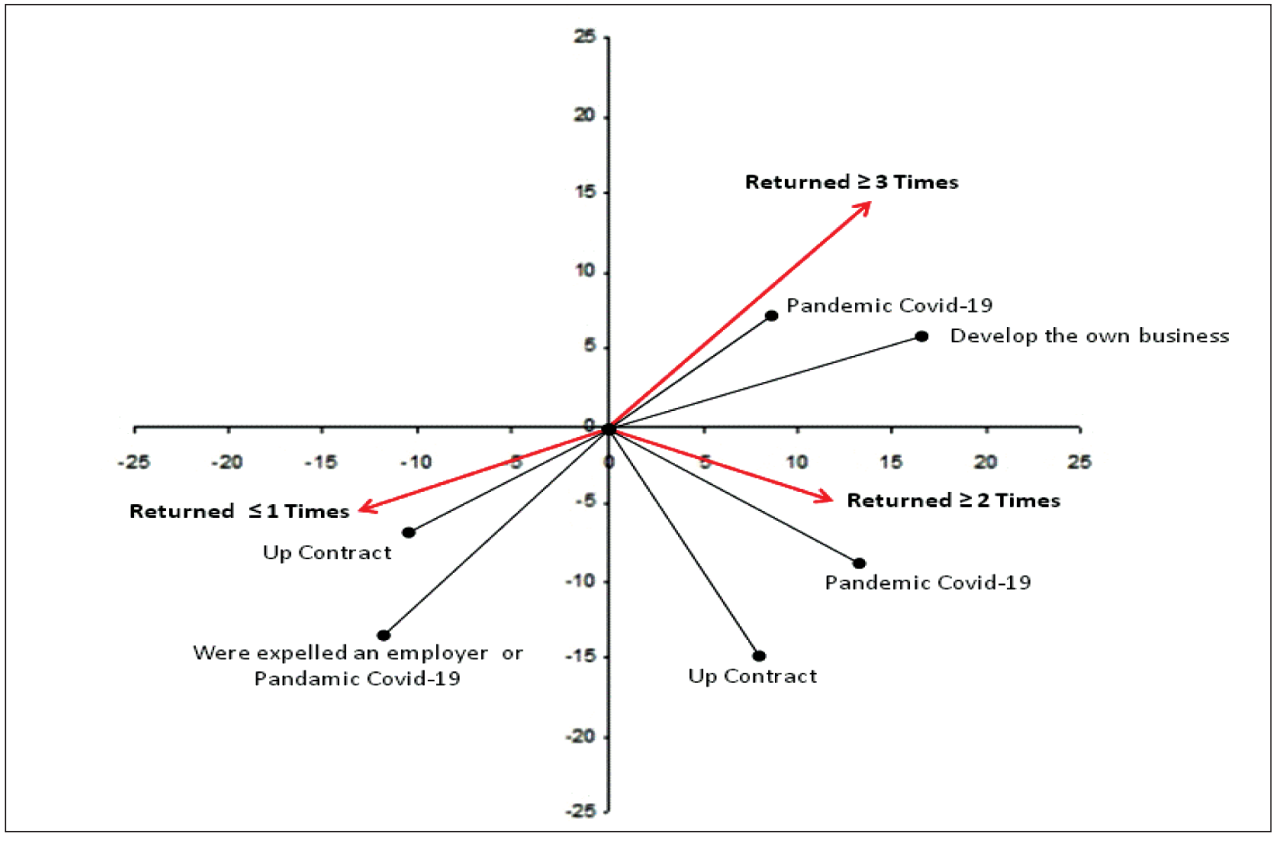

Figure 1 Characteristics of returning IMW from Wonosobo who remain in villages origin

The economic crisis of 2008 was declared to have had the same impact as the COVID-19 Pandemic. At that time, IMW returned to their homeland, region, or village of origin. This has an impact on increasing unemployment and the social economy in the region or village of origin (Kolopaking et al., 2010; Haas et al., 2016). The reason for IMW's return was the same as the reason for handling the COVID-19 impact, which was the prevention of infections.

According to the Indonesian Migrant Workers Protection Agency, stated that 126,742 Indonesian migrant workers have returned home due to COVID-19. The total number of people who returned home in April-May 2020 is projected to be 37,025. As of May–June 2020, 3,688 Indonesian migrant workers who returned home from Taiwan were found to have 441 (11.1%) positive cases of COVID-19. In the return from Malaysia, 13,074 cases of COVID-19 were recorded, with 7,417 (5.7%) cases. There were over 11,000 people who returned from Hong Kong with 3,166 (27.9%) positive cases. 1,960 cases of COVID-19 were recorded by the return of 2,661 (73.7%) people from Singapore. The data shows that the number of people who are economically and socially vulnerable in the village has increased. Those who return home hold the status of a party that needs to be watched out for being the source of the spread of COVID-19 transmission.

The economy in Asia-Pacific countries was having problems due to the COVID-19 Pandemic. Threats include launching existing businesses and not being able to go back to work abroad. During the COVID-19 pandemic era, there was anxiety among the IMWs who returned home because of the accusations of being over the village.

IMW returning from Asia-Pacific countries had economic problems due to the COVID-19 Pandemic. Launching existing businesses (39%) and not being able to go back to work abroad (22%) are threats. During the COVID-19 pandemic era, there was anxiety among the IMWs who returned home because of the accusations of being over the village.

They were confused by the treatment they received when they returned to their hometown. They are treated as if they have become a source of infections. IMW who returned said that an explanation of the transmission of COVID-19 needs to be done better and friendlier. IMW hoped that they could be involved in controlling the transmission of COVID-19. This view strengthens the opinion of those who remind us that controlling disease transmission requires commitment from all parties, in addition to requiring clear procedural fairness and transparency, honesty and openness, and avoiding the delivery of ambiguous messages.

Using digital technology to understand and handle the COVID-19 impact

Digital technology can be used to find solutions to economic and social problems, such as the use of chat applications like Telegram and WhatsApp (Parthiban et al., 2021; Parthiban, Qureshi, Bandyopadhyay, et al., 2020) or more advanced ones by using blockchain to organize supply

chains (Hota et al., 2021). The conclusion is in line with the previous theory that the development of innovative activities in overcoming social problems such as poverty, inequality, social marginalization, and access to poor health services is still limited (Bhatt et al., 2021; Escobedo et al., 2021; Hota & Mitra, 2021; Jha et al., 2016; Leong et al., 2016; Qureshi et al., 2018).

Table 1 shows that mobile phones and tablets are the most owned information and communication technology devices (94.5% of the 200 questionnaire fillers). Its use tends to be a means of conversation, with Whatsapp as an application choice (80.3%) and using social media with Facebook (44.5%) and Instagram (48.5%) applications. The applications were used to promote, buy, and sell business products.

Table 1 The number and percentage of respondents are based on the number of villagers owning digital devices and using applications in Wonosobo regency, 2021.

Application Used	Device Ownership							
	Handphone/ Tablet		Laptop/ Notebook		Personal Computer		All	
	Σ	%	Σ	%	Σ	%	Σ	%
WhatsApp	188	80,3	8	100,0	4	100,0	6	100,0
Telegram	38	19,0	6	75,0	2	50,0	6	100,0
Facebook	89	44,5	8	100,0	4	100,0	6	100,0
Instagram	97	48,5	8	100,0	4	100,0	6	100,0
Other	5	2,5	4	50,0	0	0,0	4	66,7
Summary	**200**	**100,0**	**8**	**100,0**	**4**	**100,0**	**6**	**100,0**
	189	**94,5**		**4,0**		**2,0**		**3,0**

According to an interview with MBN -- IMW leaders, online communication is no more effective than offline. Offline communication is still used to make buying and selling transactions. "Villagers still like face-to-face interactions with people they don't know." Offline communication is always balanced by online communication in the context of solidarity between IMWs returning to their home villages. They prefer to meet at local government meetings. Strict health protocols are implemented in these events. Lynn Jamieson (2013) said that social relationships in the digital era are still structural. Groups of villagers communicate based on who they are talking to. Some internet opinion leaders go home and no longer work. These people became a source of information for the villagers and were the driving agents of change in their village of origin.

Jaana Risnen and Tero Tuovinen (2020) state that the success of social innovation is determined by communication and the changing roles of opinion leaders and agents of change. Those who have broad and inclusive insights can become wise agencies and enable social innovation in the form of creative and solutive activities on social issues. This view is supported by the findings that social innovation in dealing with the COVID-19 impact is due to IWM, which is a source of information in understanding and finding ways to deal with the impact of COVID-19.

The novelty that needs to be revealed next from this research is that social innovation will be solid if it is developed from the grassroots. The answer to the question of whether the development of social innovation can be used as a political instrument is given by this (Stefan Neumeier, 2016). There is a political aspect to the development of social innovation in rural development. If the development is done by government, it can't be easily directed.

Permanent returnee IMW enables social innovation

The research found permanent returnee IMW successfully developed a multi-level governance pattern that is found in businesses run by the returning IMW community and those developed with the Indonesian diaspora community. The pattern is different but has the same pattern of recognizing individuals who have the power and influence to properly inform the COVID-19 impact and manage village business recovery. A business run by a community of returning Indonesian migrant workers has a focus on improving cooperation between local governments and villagers. The focus is to become a crisis communication hub and maintain the continuity of local businesses that are formed by cooperative networks between villages in an area using digital technology. The permanent return as social agent has strong connections with local government circles at the district level. Products produced by community businesses that return home are traded by people who have access to the global market. The businesses developed by village communities with the Indonesian diaspora are familiar with driving people.

The efforts of the permanent returnees through the development of multi-party participation at multiple levels are indeed felt promising by villagers. The research found the income of the cluster of villagers who are doing business through partnering with the diaspora and IMW communities in Desa Kahuripan and Lipursari has decreased due to the uncertainty of returning to work abroad in the research village. The processes that occur in businesses can be seen in Table 2.

Table 2 Analysis of village businesses affected by COVID-19 impact in Kuripan and Lipursari, 2021

Diaspora community cluster	A cluster of returning indonesian migrant workers
a. Sales of non-food products have fallen due to the COVID-19 Pandemic. Consumers prefer meeting primary needs over buying secondary and tertiary products. b. Orders from business partner companies have stopped due to product shipments abroad that have stopped due to closed logistics lines. c. There has not been coordination between institutions from the village and above the village. There is no compliance regarding the development of healthy behavior and the recovery of lost businesses. d. The village community's ability to face challenges without trying for synergistic handling by all parties from the village to various levels above. e. It is estimated that there will be migration from rural areas to cities, and the departure of workers abroad through illegal channels will increase again.	a. Families face declining income due to uncertainty about returning to work abroad. b. Businesses in villages that have returned permanently have seen a decline in sales of their products due to local resource management efforts. Consumer spending patterns have shifted to prioritize the fulfillment of basic needs and immune-Enhancing supplements. c. The plan of the IMW community is to open a business in the blood if it faces institutional problems, especially the coordination between institutions in synergizing in controlling COVID-19. d. It will have an impact on the economic decline of IMW households and their home villages if there is no room for them to return home to work. It is thought that going abroad through unofficial channels will increase.

In the context of developments in two villages as research locations for controlling the transmission of COVID-19, it is noted that community-based creativity is growing. These steps are less in line with economic problems due to the decline in sales of products from business activities in the village and are more efforts to deal with problems of healthy behavior in the community. The decline in sales is predicted to reach 70% of the transactions by the existing business groups. From deep interviews with community leaders in Village Lipursari, it was found that they needed a policy recommendation to be made for the government to act quickly to build a pattern of coordination and synergy between parties in stages from the village in dealing with the impact of COVID-19. It was noted in these activities that controlling the transmission of COVID-19 through the development of healthy behavior needs to be in line with handling the decline in the household economy, both from returning IMWs and communities that have partnerships with the diaspora community. The increased use of social media is said to be a part of the process.

In Wonosobo Regency, there are many examples of successful activities like migrant enterprise. The other village in Java is Pasirgombong, Bekasi Regency, which synergizes the health recovery process based on economic strength. Another example is Village Own Enterprises Suka Maju in Popoh Village, Sidoarjo Regency, which makes syrup and capsules from herbal plants. The business is growing because of promotions. The creation made from local herbal plants has penetrated the marketplace and social media on a national scale. The two examples above were developed by working together to address village health and economic issues. Digital marketing of innovative village products can help with business recovery and development.

Social media is used to share knowledge. Through this network, IMW becomes a digital community that works together to prevent the spread of COVID-19. Loss-making businesses are restored by digital. Changing the motto from "working together" to "collaborating" will accelerate the process. Table 3 shows the post-COVID-19 response efforts.

Table 3 Post COVID-19 response efforts in Desa Kuripan and Lipursari, 2021

Diaspora community cluster	A cluster of returning Indonesian migrant workers
a. Businesses are trying to increase the types of products they sell. Trying to produce products that are both desired and needed by consumers. Sales and revenue are expected to increase with the addition of products. b. The businesses carried out by the diaspora community have used the internet for promotions but have not maximized their use. The business works with payment companies. Efforts were made to increase the use of internet media as a solution to overcome the limitations of activities that were carried out offline. A generation green application can be downloaded on the Playstore. There are various types of green products on Gen-green. A new brand will be formed by the multi-stakeholder collaboration.	a. In the case of returning Indonesian migrant workers, COVID-19 can be used to quickly access information. The recent experiences of returning Indonesian migrant workers who have been open in communicating using digital technology can be used to control the COVID-19 crisis. b. Indonesian migrant workers are using social media to buy and sell. Several digital media applications are used by them to sell local products, such as Facebook, WhatsApp, and even some e-commerce platforms such as Shopee, Bukalapak, and Kaskus.

The permanent returnee IMW strengthens digital networks with their communities, as well as with IMW who are still working abroad and the Indonesian diaspora community. Collaborative networks are developed to focus on reinvigorating a network of cooperation between parties at multiple levels, who tend to be suppliers of raw materials or semi-finished materials for the products they develop. The product is sold domestically and abroad. This process can be used by businesses to encourage healthy behavior related to the recovery of local business activities in overcoming the COVID-19 Pandemic with the unique ability to internationalize local products to the national and global market. The diaspora community has multi-level business governance as shown in Figure 2.

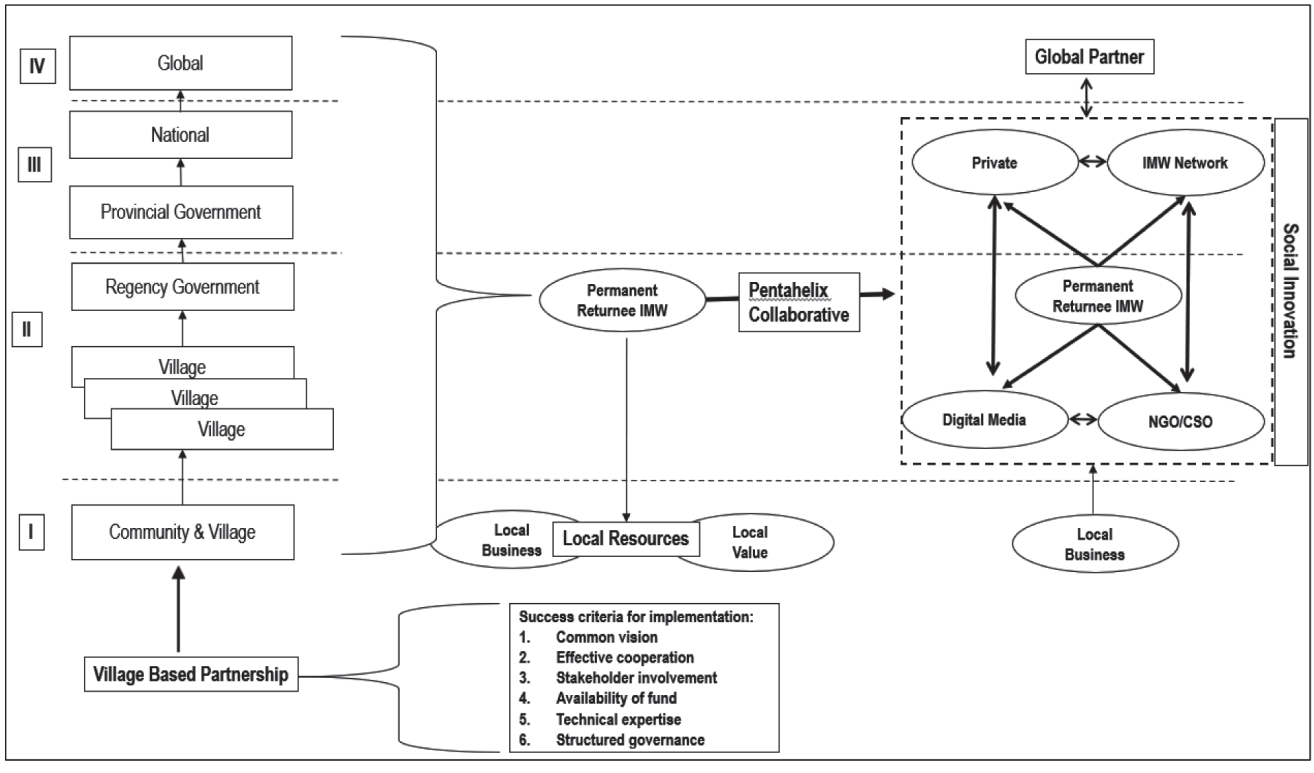

Figure 2 Multi-level governance of the Wonosobo's returning IMW and the diaspora community to control COVID-19 impact

The development of multi-level governance can be traced back to the control of the COVID-19 impact. Local governance recognizes a driving agent that considers local natural resource management and local values. The positive climate of multi-level governance is said to include a shared vision, effective cooperation, stakeholder engagement, availability of funds, technical expertise, and governance, as well as the presence of this agent as a bridge between parties at various levels. It was structured. Social innovation is achieved through multi-stakeholder collaboration. A form of collaborative governance in collaboration with various actors and levels who have succeeded in building synergy and sharing roles to support efforts to control the transmission of COVID-19, which is related to the recovery and business continuity of communities at the grassroots (Table 4).

Table 4 Penthelix division in network roles of village based participatory recovery together movement for COVID-19 recovery, 2012

No	Stakeholder	Roles
1.	Indonesian migrant worker community	IMW has a strong focus on the district level in businesses run by communities of returning Indonesian migrant workers. Local businesses are formed in an area. IMW has good connections with district governments. Products produced by the returning Indonesian migrant worker community are sold directly to the global market.
2.	Indonesian diaspora community	Local businesses have been involved in supplying raw materials for the products to be produced in the Indonesian diaspora community. The product is marketed both domestically and abroad. There is a lot of Indonesian diaspora community in foreign markets.
3.	Government	Following their authority, the government from the village, district, province, and central government has played a role as a regulator. It is necessary to play an extraordinary role in order to strengthen the above processes as well as the assistance of human resources and the development of synergistic programs so that village internationalization can develop even more rapidly.
4.	Private/NGO/Philanthropic Institutions	The private sector, NGOs, philanthropists have not been exposed as part of the development of the collaborative network. The sharing of financing in developing social investment is still very open, so the opportunity for this collaboration is still very large.

The multi-level governance driven by IMW Leader as agent for controlling the COVID-19 impact believes that the role of government is important at various levels. The Indonesian diaspora community needs access to digital technology and ease of doing business to be able to create jobs. De-regulation is important to do because it encourages the maximization of the roles of each stakeholder and does not leave the main duties and authority of each. For innovation to accommodate the fulfilment of trends on an international scale, agents need to be more partners in terms of seeing global development trends. This is conceptualized as an agent of digital social innovation that involves partnerships across sectors and various stakeholders.

According to the findings, Karsidi (2020) stated that handling the COVID-19 impact in Indonesia as social innovation needs to be based on re-social engineering, which is based on local culture and, at the same time, has an impact on strengthening. This social innovation, developed from this grassroots, requires a driving agent and is necessary for the development of pentahelix cooperation. It's not triple helix. Social innovation necessitates collaboration among the government, private sector, non-governmental organizations, community social organizations, and the media on the basis of resources and local actions that can have a national, even global impact.

Conclusion and limitation

The novelty in this study is that there are social innovations being initiated by villagers. In order to restore the village to managing development, creativity is needed in creating products and economic business opportunities as social innovation for handling the COVID-19 impact. The village community can use internet intervention in the village. It was used by creative individuals who came from the former IMW and members of the Indonesian diaspora who became agents of the driving force for the development of social innovation in the form of multi-stakeholder collaboration management. The internet is one example of digital technology. This means that social and digital technology cannot be separated from the development of social innovation in pandemic control that maximizes local resources and values by considering global conditions. The social innovation that has been developed has been able to drive collaborative governance in collaboration to open the promotion of healthy living behaviors as an integral part of village business development.

The form and process of renewal developed as a social innovation is a system of collaboration between parties to strengthen the village economy. The process is a Participatory Recovery Together Movement for recovery from the COVID-19 impact, which relies not only on assistance but prepares a transition program after COVID-19. The power of the community must be considered by the government. The government plays a major role in overcoming society's problems. Solidarity is strengthened and the government's role is strengthened. With the strength of

this research, bridges between the roles of the community and the government can be built. Digital technology infrastructure isn't evenly distributed to remote villages.

The limitation of this study is that it does not examine the availability of infrastructure in remote villages. The recommendations of this research are related to further studies; the provision of infrastructure that is evenly distributed in the village; and the utilization of building solidarity when facing crises in the health and economic fields. Increased research on the use of digital technology can be seen as a social innovation.

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The promotion of sustainable cultural tourism of Local Alike company

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Abstract

Nowadays, tourism is one of the main income-generating industries in Thailand. Mass tourism has fueled the economy in this country. At the same time, it has negatively affected many communities. Consequently, Thai society at the present has more awareness about the importance of keeping balance between tourism income, preservation of community, and preservation of the environment. However, a few social enterprises have run its business with a good practice of sustainable cultural tourism. Local Alike company is one of the most successful of social enterprises in Thailand. This company aims to gain income from tourists, while also give tourists great opportunity to encounter with local communities, lifestyle and goods and generate incomes to local communities at the same time. Therefore, this research titled "The Promotion of Sustainable Cultural Tourism of Local Alike Company" has been convened to mainly study philosophy and business guidelines for promoting sustainable cultural tourism of Local Alike Company.

The research found that the business philosophy of Local Alike rests mainly on business success based on sustainable cultural tourism. In doing its business Local Alike company has also paid attention to its mission in generating economic, social and environmental well-being of its networking communities. Besides, Local Alike company has operated its business based on 6 steps business guideline aiming to promote sustainable cultural tourism in Thailand. The 6 steps are (1) Finding local communities to join in its business network. (2) Developing tourism strategy with active and close cooperation with such local communities. (3) Offering tourist packages which

tried to connect tourists with local communities to create real, in-dept cultural tourism experiences. (4) Making a social environment effect survey of its tourists' program on networking communities. (5) Assisting in community funds operation. (6) Helping advertise the networking communities.
Keywords: cultural tourism, Local Alike, local community, sustainable development

Introduction

From the past until the present, tourism is an industry that makes a lot of income for Thailand, and it is an important role in the Thai economy and society. We observed from crisis moments. For example, when Thailand encountered an economic crisis, tourism has a huge role in revitalizing the economy in a very quick time. Due to Thailand has a proportion of tourism industry 21 percentage of GDP, it makes employment in the country around 4 million people. (UNESCO, 2020) In the past, Thailand has foreign tourists more than 22.7 million in each year. (Techsauce, 2019) Thai tourism has given importance to mass tourism because it makes economic growth. On the other hand, it impacts many tourism locations and communities to suffer from deterioration and many problems that reduce Thailand's advantage. (สุเนตร สุวรรณละออง, 2012)

Therefore, Thai society has realized the importance of tourism from these impacts. They change the patterns of tourism from quantitative-oriented tourism to qualitative tourism. Because of, the circumstances and crises. Many cultural attractions have adapted to the online format. In combination with various factors, many sustainable cultural tourism businesses have failed. However, there is a company named Local Alike, one of the social enterprises in community-based tourism that succeeds in sustainable cultural tourism in Thailand because it is like a tour company, but it is different from other tour companies. Local Alike company aims to promote and support the local community by using local community tourism as a tool for community development. It also helps to improve the quality life of local people in the community. Thus, the culture of the community has been published to other tourists. As a result, Local Alike Company has been successful in terms of cultural tourism in Thailand both during normal and crises.

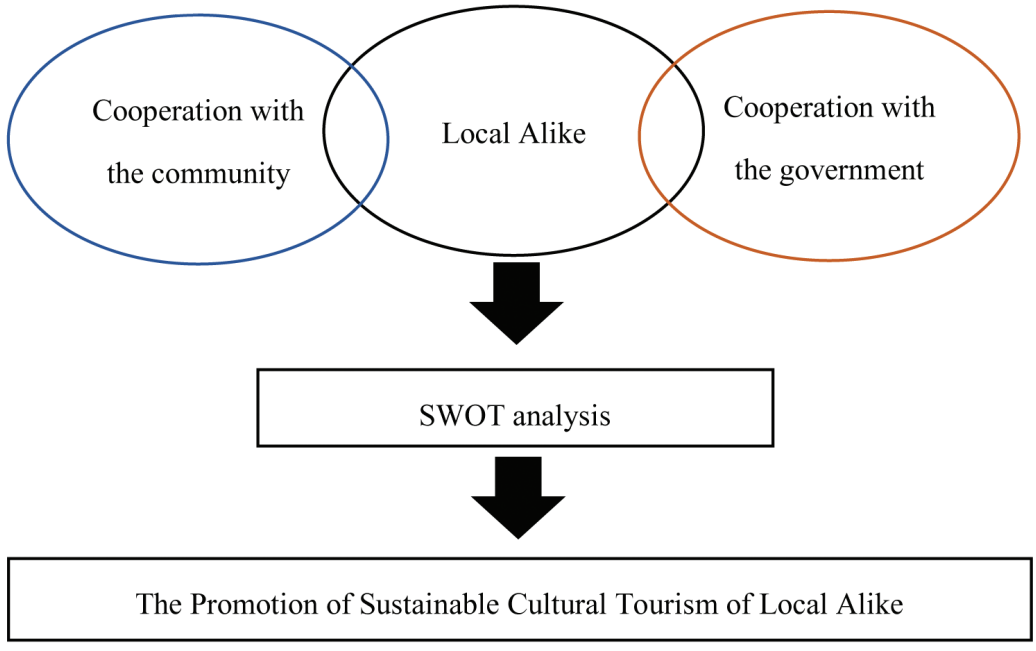
Therefore, the researcher has a purpose to do this research which is The Promotion of Sustainable Cultural Tourism of Local Alike Company. To study philosophy and business guidelines for promoting sustainable cultural tourism of Local Alike Company.

Objective

To study philosophy and business guidelines for promoting sustainable cultural tourism of Local Alike Company.

Framework

In this research study, the researcher focuses on studying the business model of Local Alike with the research conceptual framework, according to the diagram below:



Methods

This study is a case study research and quality research. The objective of this study is to study philosophy and Business guidelines for promoting sustainable cultural tourism of Local Alike Company. The researcher has a research pattern as follows:

1. Studying theories, articles, journals, and research that related to the promotion of sustainable cultural tourism through Local Alike company and the objective of research.

2. Studying the data and methods of creating tools from books, documents, and related research.

3. Making the tool. The questionnaire used in this research was an in-depth interview question, which was an open-ended form.

4. Taking the advice received from the experts to improve the tool.

5. Asking for cooperation in interview with Local Alike staff who involved in the promotion of sustainable cultural tourism for scheduling in interview.

6. Writing a letter to Local Alike company for requesting permission to visit the site for interviews and request permission to record information for each interview.

7. Interview with those involved in the promotion of sustainable cultural tourism of Local Alike.

8. Gathering data from interview forms by linking the data from in-depth interviews together with the study documents before being analyzed.

9. Concluding of data and recommendations from the study on Sustainable cultural tourism promotion through Local Alike Company.

Results and discussions

The researcher gathered data from In-Depth interview with representatives of Local Alike company and cooperate with related articles and research papers. The study results were divided into two parts:

Part 1 Social Enterprise of Local Alike

Part 2 Business guidelines for promoting sustainable cultural tourism of Local Alike Company

Part 1 Social Enterprise of Local Alike

1.1 The origin and philosophy of Local Alike company

In the study of Local Alike' s beginning a social enterprise, it was found that many social enterprises have different philosophies and different beginning for doing social enterprise, but Local Alike company has the main philosophy and beginning from the local community. Due to Mr. Somsak Boonkham (Pai), the founder of Local Alike company realizes that community development is important because he had the opportunity to live with the villagers and saw the potential of each local community can be a unique tourist destination, coupled with he came from the province. Therefore, he wanted to help distribute income from major cities to the local people through more tourism. (สำนักงานนวัตกรรมแห่งชาติ, 2565) Moreover, the founder has also realized the problem of unsustainable tourism nowadays because local people are not involved with the way of tourism and earning of tourism is not distribute to local people who own the resource. (สำนักงานส่งเสริมวิสาหกิจขนาดกลางและขนาดย่อม, 2564) According to an interview with Mr.Nanop Muangkliang (Pream), he mentioned to performance of Local Alike company.

> *"When we do travel or do projects from the government, we will focus mainly on the local community. It means that we will not take the project that has been acquired to match the local community, but we will see which local community want to do and suitable with this project. However, we have to see how ready they do it and we will prepare them like a mentor."*
>
> (Pream, Interview 16 March 2022)

The beginning of this social enterprise can reflect the philosophy of sustainable tourism business that focuses on local community development. It helps local people to self-sufficient. Moreover, it takes them to the human potential development, promoting the economic, including social and environmental. These factors are linked to the founder's statement.

> *"When local people can self-sufficient, it is the most successful goal of Local Alike because doing business like this. It brings them to have better benefit, better economy of the local community and better environmental that make the society to grow."*
>
> (workpointTODAY, 2564)

Therefore, the philosophy of Local Alike that based on belief and commitment for making sustainable local community tourism. The development that consists of experience and understanding for both tourists and the local community brings them to succeed today. In addition, the development, supporting, and promotion quality of local people's life through tourism is important for rural development to raise the standard of living in the countryside to be better because they support them to have the ability to increase productivity, such as earning money from the handicrafts, or transforming the culture into products that Local Alike is working on. It is to help local people and poor people to get opportunities to do something that make them have a better life. If they are self-sufficient, more accessible the government services to their place and make more travelers come. Business operations of Local Alike not only according to development concept but also according to Redistribution with Economic Growth Theory of Hollis Chenery and Reginald Green (1974) that mainly focuses on community development and also focus on distribution the results of development to people who are not self-sufficient.

1.2 Definition of cultural tourism promotion by Local Alike company

> *"The local community turned to make their own place as a tourist place and can manage the tourism by themselves without changing their lifestyles and tradition to other contexts. Moreover, these local community has saved their own traditions and culture to next generations that presenting wisdom, way of life, culture voluntarily and willingly to publicize the world that this is my community. And it will become one point that promotes community tourism and culture at the same time."*
>
> (Oat, Interview 16 March 2022)

It showed the promotion of cultural tourism of this company. Local Alike is a part of the promoting the cultural community through the tourism, so the definition of cultural tourism

promotion by Local Alike company means the promotion of culture community through various forms of tourism such as activities, local handicrafts. Including local food, decorated with the identity and unique culture for tourists who come to be impressed and understand until they need to join and preserve the culture.

1.2 Problems in promoting sustainable cultural tourism of Local Alike companies

1.2.1 Community structure

Some local communities that Local Alike joins have insufficient knowledge and potential to develop tourism routes. It led to unsustainable tourism. We can observe the structural problems of the local community from saying of Mr. Nanop Muangkliang (Prem) as follows:

> *"Mostly, we found problems about human potential in aged because some communities have not a second leader or generation y and z people. It would hinder the development to use electronic tools. However, some communities have a child who does not go to work far from their community. It is still enough to ask them for help. Mostly in the model community, second leaders are looking for online marketing or using technology and management tools, such as account management. If community where has many aged, they would write the paper more than computer or pc. On the other hand, if the community has second leaders, they will use the excel program in the commuter. These are clearly a difference in management to use technology tools."*
>
> (Pream, Interview 16 March 2022)

It presented the process of working with the local community from the beginning by exploring the structural problems of each community for using it as a guideline to develop the local community to be a tourist attraction and promote sustainable culture. The problem conditions and structure of each community encountered are different that depend on each local community.

1.2.2 Marketing

From the problems in the community structure above, the local community does not have enough basic knowledge that takes them to meet marketing operations not smooth. Our social marketing has always changed. If some local communities do not have the good marketing knowledge or lack experts will attract fewer tourists and they will not be able to reach tourists by themselves. This problem is an important tourism promotion because marketing, such as public relations or attractive product design is one process that can attract tourists to participate in community activities for making income in the community.

"Advertising, we focus on foreign because we do not sell only in the country. We sell through the website. So, foreigners who travel to CDP do not usually travel in mass tourism, but they will find their information especially. Most of the advertisements are distributed via Instagram, Facebook, and websites for foreigners. Most Thai people do not know about CDP. In fact, many tourists in Thailand are very interesting so, it attracts foreign tourists to travel."

(Oat, Interview 16 March 2022)

Therefore, Local Alike's marketing problems still have problems with public relations management both inside and outside of the company. Including, designing community products to be more attractive for attracting more tourists to join and use the service of the local community.

1.2.3 Foundations

Fund issues are one of the main issues for starting a new social enterprise and promoting sustainable cultural tourism because doing business is necessary to have a foundation for development. According to this study, the researcher found that Local Alike does not have internal fund problems but found from the local community that Local Alike joins.

PeerPower Team has cited Local Alike that they faced the problem of community has no income from tourism. According to Billion Mindset in 2018, Thailand's tourism industry revenue is 21.6%. When cutting countries with populations below 20 million, Thailand will be the country with the 4th highest tourism income in the world, but this income does not distribute to local people and this income is stopped at hotels and travel agencies. Therefore, the tourism community cannot stand by itself. (PeerPower, 2020)

It reflected that some local communities have problems with funds to work together with Local Alike company for making their tourist attraction. According to a representative of this company, Local Alike has solved the problem by two methods: finding funds through the website, and other methods is finding funds through hiring from the government and private sectors for making the local community progressive. The details of solving the problems will be explained in the next section that is Business guidelines for promoting sustainable cultural tourism of Local Alike Company.

Part 2 Business guidelines for promoting sustainable cultural tourism of Local Alike Company

From the study of documentation and interviews with representatives of Local Alike about business guidelines for promoting sustainable cultural tourism. It was found that Local Alike has a guideline for promoting sustainable cultural tourism in 6 steps.

1. Finding local communities to join in its business network. There are two methods: Finding a community through direct dialogue with the local community, and finding communities through government and private projects

> *"Mostly, we find a local community by ourselves, such as government projects. They will announce from various sources, such as websites. So, we have teams to keep track of this news. Our teams will look at the requirements of each section in each company. After that, sales teams and development teams will work together with operation teams to see the patterns and layout of projects. This is our working when we are finding a local community."*
>
> (Oat, Interview 16 March 2022)

Moreover, trusting of local community is also important part of accepting to join the projects and increasing the efficiency in promoting cultural tourism. Because of trusting, it takes us to good work including making the result of works come out more effective because the community trusts in the company and recognizes the value of intangible cultural heritage and local resources that is an important cost for developing communities to become a tourism and promoting more sustainable cultural tourism.

2. Developing tourism strategy with active and close cooperation with such as local communities.

> *"The case of creating a tourist route, if the community has many cultures to present tourists, we don't even need to excise, but we will think how we can manage it for tourists to get experience every point. If it has more than 10 points that the community wants to present in the 1-day trip that is not enough to present, we may have to adjust the duration for 2 days. If the community want 1-day trip that has a lot of points to travel, we need to talk about time constraint so that we can combine 2 cultures and 2 identities into one place. We need not choose which is more important or which is more unique. In fact, the important factor is asking the community what they want to communicate with tourists. And, talk about travel experience in limited time because too much experience can make tourists bored and tired. So, this is our solution."*
>
> (Pream, Interview 16 March 2022)

It reflected that creating the tourism routes of Local Alike that cooperate with the local community is understood for community and apply tourism routes by existing cultural identity of each community. Including the environment to be modern with the new generation as Generation x and Millennials by creating routes depending on their idea. Moreover, having good standards along the way and having the best moment and impress for tourists to come back this local community service again. Plus, to be a part of promoting sustainable cultural tourism.

Furthermore, we can see the process of developing tourism within the local community. They need to find their culture or identity as a selling point and learn how to apply it to attract tourists.

> *"Local community must clearly show their culture or identity that is interesting. If the community has a clear culture to show and communicate, but lack interest or lack access to tourists, it will lose its value. It means if their culture is promoted with a lack interest, it will be ignored immediately. Therefore, the difficulty of culture is making it interesting that culture to convey."*
>
> (Pream, Interview 16 March 2022)

It is connected to the management of Local Alike company that promotes culture by presenting the identity and culture of the local community through food and products. Each local community is not only outstanding in tourism, but other elements stand out and can be used to generate additional income, such as food, representing the culture and history of the community. Therefore, Local Alike make a new project that presents food and products from the local community. For example, Local Aroi is about bringing community food to add value and add a story into the food. Furthermore, there are local community products under Local Alot project, which is the center of the online community product market in Thailand. Each product has been selected for quality, price, and distinctive cultural identity. (Tourism Trend Talk, 2565) To be recognized nationally and globally including the development of local people's skills in the community. Including, create career opportunities and sustainability of community culture.

However, co-development with Local Alike and the local community is based on four development principles: ๑) human development ๒) business and service development ๓) technology development and ๔) social and environmental development. Because of these four development principles, it is the connection to sustainable growth. It aligns with the Sustainable Development concept in the report named Our Common Future (World Commission on Environment and Development, 1987) In definition, it is a concept that aims to improve people's quality of life by maintaining the level of humans that use natural resources not to exceed the production potential

of nature and focusing on the balance between the environment, society and the economy, instead of focusing on economic growth goals like general business development. While Local Alike company has a long-term perspective under prudence. They consider the impact that will follow on the future and make the next generation to be cared and cherished for their culture. In addition, the activities organized by Local Alike Company with the local community, such as the development of tourism routes. could increase the risk to the environment or the health of future generations. Local Alike and local community have taken action to prevent and create understanding for the community. Including, suggesting solutions to solve these problems.

3. Offering tourist packages which tried to connect tourists with local communities to create real, in-dept cultural tourism experiences. There are 2 ways: using online platforms to help each other and another way is word of mouth.

> *"Disseminating culture to be known about the culture of the local community. Mostly, will make through advertising."*
>
> (Oat, Interview 16 March 2022)

From the above, we can see that nowadays, our society is a globalized society. Everything is connected all over the world. As a result, today's marketing is heavily influenced by globalization. A lot of people are using platforms to trade and organize information online, and the second is word of mouth.

> *"The best free marketing and the most effective result is the word of mouth. Because of tourists, they take us to advertise by themselves. For example, if they like to this travel, they will talk to their friends or others for traveling here. So, we will have possibility to get new customers from them. In this way, it a higher percentage than we advertise through applications because these travelers or tourists get their own experience and confident in quality to recommend people."*
>
> **(พัชรวรรณ เปี่ยมสุมบูรณ์, 2565)**

It reflected that Local Alike emphasized connecting communities with tourists because tourists can boost tourism and promote culture for sustainable growth in the local community. The two methods that mentioned above, it presents cultural tourism through the experiences of people who have experienced it. Moreover, it is a factor that attracts more tourists to join the local community.

4. Making a social environment effect survey of its tourists' program on networking communities

Making a social environment effect survey of Local Alike has a huge impact on promoting cultural tourism. As the process can identify, predict, assess, and mitigate the impacts associated with promotion and assisting development of company before any action is determined. Consequently, following the impacts need to have data gathering, systematically analyze, and apply the results to decision-making, revise, and improve the implementation of the plan. To achieve the best quality and efficiency of various projects. For example, the Khlong Ta-In Community Project, Chanthaburi Province.

> *"The latest is the Khlong Ta-In Community Project. It is a local community that the government nominated us for making this place for community tourism. This area has a forest zone that is a problem because there is an invasion of elephants in this area that will cause the living of local people to be dangerous. For example, elephants come to eat agricultural products and eat the fruit of people. The government realized these problems, so they took this community to do tourism together with Local Alike because they want this community to get income and have activities. Local Alike acts like a mentor to develop the potential of the local community to be able for doing CDP. In following this place, we found that they use elephant patrols as one of the activities for tourism. This working is so hard for us because there are not many clear activities to play like other communities, so the only activity that they will be available is lifestyles and culture, such as riding an elephant. The first step, they don't understand community-based tourism because they have never do tourism before and they have a few activities, including their activity about elephants is a new activity for tourists. All factors, make us think and analyze a lot about how we should deal with it because we never have experienced in this case before, so it's a challenge and it well done."*
>
> (Oat, Interview 16 March 2022)

From the study of example above, Local Alike not only promote their lifestyles and culture like riding an elephant, but they also follow the impact in each situation. The goal cannot be achieved without everyone cooperating and interdependent. It is consistent with the concept of dependence theory. The Interdependency Theory of Robert O. Keohane and Joseph S. Nye. It is a concept that focuses on the importance of interdependence. with a focus on the economy. They believe that if we get more dependent on each other, the way to success in market is high. In the actions of Local Alike, we can see that all sectors, such as the government, Local Alike, and the community have cooperate and dependence on each other to motivate and develop the community

to create tourism routes. To become a tourist attraction where tourists come to spend and circulate money. This result makes the country's economic progress in the future, and it carries on the cultural identity of the community to be known by tourists.

5. Assisting in community funds operation. From the fund problems, it brings Local Alike to find solutions for local community because the fund is one of the important factors in the development and promotion of sustainable cultural tourism.

> *"Community income happened when the community has a tourism route. most people in the community do not look at the main income, but they mainly look at distribution of income. For income management of Local Alike, assuming, we can sell tours, right? First, we teach local people to calculate costs. Then, we can get the selling price. The selling price must be clearly discussed with the community at the price to sell us. Must go to add more from tourists for our own management fee because we operate independently. We don't have main funds from the foundation or from any other source, so we must rely on our sales of services..."*
>
> (Pream, Interview 16 March 2022)

It reflected that doing community funds with Local Alike. This company make understanding about income and fund management to local community. Including, find initial capital through fundraising and through the public or private sectors who want to come and help support the community because the community needs a fund for manage business and add new things progressive. Moreover, Local Alike also support to making funds of community that is not normal funds about money but it a funds that consists of (1) individual capital, (2) social capital that make people in the community into a strong society and can stand by themselves, and (3) cultural capital that is a common way of life. (4) Moral capital that is the validity of coexistence, such as trust and mutual assistance; (5) Conserved resource capital is used fairly and sustainably; (6) Intellectual capital from the practice and the knowledge in the community to take and apply them into something new. (สำนักงานกองทุนหมู่บ้านและชุมชนเมืองแห่งชาติ, 2565)

6. Helping advertise the networking communities through themselves.

Local Alike use many own technology platforms to help local community for promote cultural tourism. Moreover, they use themselves as a spokesperson to help community through the brand name and logo. Local Alike in the Thai language has significant 'like a villager' (เสมือนชาวบ้าน). This meaning showed the meaningful experience and understanding for both tourists and the local community. Besides, they use themselves as a spokesperson through projects that collaborating with various agencies for supporting other communities.

An example of the success of being a community voice in the Journey D (The Journey of Development). This project is a collaboration between Air Asia and Local Alike that supports the creation of tourism routes in more than 100 communities in countries. Air Asia and Local Alike will help and be a link between local communities and travelers. Moreover, they design and develop tourism standards together with the community. Various experts were invited to work together. Besides, Their standard being clean, safe, good service, welcoming tourists well. These ideas will lead to creating new income ways for the community and also promoting cultural tourism because Air Asia is the ways to sell community products. (ฐานเศรษฐกิจ, 2562) The project has activities to cover 3 issues that is development and upgrading of community-based tourism standards, community product development, and transfer knowledge to the community. (JourneyD, 2022)

Therefore, being the voice of Local Alike make people know about the existence of the communities that Local Alike work together by presenting through various products decorated with the distinctive cultural identity of that community or province. Thereby, supporting sustainable cultural tourism leads to cultural tourism that make income for communities as well as income for entering the country.

Conclusion

Studying the philosophy and business guidelines for promoting sustainable cultural tourism of Local Alike Company found that philosophy of Local Alike focuses on community development in working because they realize the community's problems and seeing the potential of each different community with unique and distinctive cultures. It can be developed as a sustainable tourist destination as well as helping distribute income to poor people in community. As we can see, Local Alike company show their idea through the band named and logo, which means like villagers. It presented the work processes and understanding of tourists' side and community's side for developing, supporting, and promoting the quality life of local community through various products and services. As this result, it takes many tourists want to participate in community activities. Moreover, it generates money circulation and generates income for the country for the next period.

In addition, Local Alike found problems for promote of sustainable cultural tourism. There are divided into 3 factors: structure, marketing, and funds. Overall, it was caused by the lack of opportunity, knowledge, and lack of funds in some communities. As a result, those communities do not have the funds to develop and promote cultural tourism that communicate their identity and culture to have more potential and quality. However, Local Alike company has a guideline to promote sustainable cultural tourism in 6 steps that is (1) Finding local communities to join in its

business network. (2) Developing tourism strategy with active and close cooperation with such local communities. (3) Offering tourist packages which tried to connect tourists with local communities to create real, in-dept cultural tourism experiences. (4) Making a social environment effect survey of its tourists' program on networking communities (5) Assisting in community funds operation. (6) Helping advertise the networking communities through themselves, for example logo and the name of its program and through helping the community in coordinating with Government and private enterprises. These guidelines hold to sustainable development's principles that is develop together with people, business and services, technology, society and the environment. These development concepts are linked to sustainable growth. If something is missing, it will be out of balance and may affect any one thing. For example, if there is a lack of technology, the community will not have the full potential for sales growth because technology is important and convenient to support doing things in the present, etc.

Moreover, business guidelines for promoting sustainable cultural tourism of Local Alike Company found that the business like a social enterprise can be successful by rely on each other. It can be seen that Local Alike has made friends with government and private agencies to promote community tourism through products and services that communicate the distinctive identity and culture of each community through various projects because they support the community to be a sustainable tourist. Besides, they preserve the culture of the community, such as collaborating with Air Asia. Local products are brought on planes. These products generate income for communities and country as well as to promote the culture of the community.

Recommendations

1. For the policy, it should support a participation between the government, the private sector and the community for achieve integration and effective results. Furthermore, policies related to environmental conservation should be established to prevent the deterioration of tourist attractions in the community and support the potential of community tourist attractions by focusing on the development of identity the community›s culture as a highlight to accommodate tourists appropriately.

2. For further research, the researcher should be studied specifically, such as the structure of community, the marketing, or the foundation for improving society progressive.

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Models, Management, and Measurement of Social Sustainability

Community participation in reduce, reuse, recycle to preserve Cikapundung river basin, Bandung, West Java, Indonesia

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Abstract

The article aims to explain: (1) community activities in the application of Reuse, Reduce, and Recycle (3R) to reduce waste in the upstream, middle, and downstream Cikapundung sub-watersheds; (2) factors related to the application of 3R, and (3) strategy to increase community participation in the conservation of the Cikapundung sub-watershed. The study was carried out in the three villages of Cikapundung River Basin, namely in Sunten Jaya Village, West Bandung District (upstream), in Lebak Siliwangi Village, Bandung City (midstream), and Dayeuh Kolot Village Bandung District (downstream). A survey to 196 household's respondents from three sites was held to gather data about 3R. Data were analyzed using qualitative and descriptive statistical analysis. The results showed that most households produce 0.5 kg of waste/day. The types of waste produced are varied in terms of organic and an-organic waste. All households in three sites produce plastic, cans, paper, and food waste because of daily activities. The community groups implement different 3R activities to preserve the environment. The activities include developing communal biogas from cattle manure, reuse waste into products that have economic value, such as bags, doormats, tissue holders, and wallets. Knowledge and awareness of environmental care and community engagement in managing waste increase the 3R practices. Environmental education-extension at community level is needed to encourage motivation of community groups and continuous actions for the betterment of Cikapundung sub watershed.

Keywords: Cikapundung sub-watershed, community participation, environment, 3R

Introduction

Community plays a crucial role in caring for the environment. Reuse-reduce-recycle (3R) is one of the activities that communities contribute positively to protect the water resources in rural and urban areas. This article focuses on community participation to protect water resources by actively implementing reuse, reduce, and recycle. Policies or programs from the government or other parties will not succeed without community involvement. The Cikapundung Watershed (DAS) is part of the Citarum watershed which has important hydrological and ecological functions. This watershed is in the Bandung Basin, has a length of 28 kilometers, an area of 43,439.04 hectares and passes through three administrative areas, namely West Bandung Regency (upstream), Bandung City (middle) and Bandung Regency (downstream). Until now, the Cikapundung watershed functions as the main drainage and is used to meet the needs of agricultural irrigation, raw water sources for drinking water, electricity generation, as a flush to support the health of the city's environment, and tourism objects (Sofyan, 2004; Sabar, 2006).

The quality of the environment and ecosystem of the Cikapundung watershed is currently decreasing and worrying. The Cikapundung sub-watershed experiences a very high intensity of human activity, and this has a negative impact on the quality of the environment and the quality of human life. The high land use change in the Cikapundung Hulu sub-watershed reduces the overall conservation function, it is recorded that the Cikapundung watershed has an area of 434.34 km^2, run-off is 529.5 million m3/year, and sedimentation is 1,023,347 tons/year (Cita Citarum, October 2012). The number of residents who live also reaches 750,559 people. Data from BPLH City of Bandung and Ari (2008) noted that there were around 1,058 houses located near the banks of the Cikapundung River. Some residents on the banks throw garbage and waste into the river, making Cikapundung a channel for collecting and carrying household wastewater. More than 2.5 million liters/day of waste is discharged into the Cikapundung River and this condition continues to this day.

The problem of waste and waste management, especially in the Cikapundung watershed area, is related to the increase in the volume of household waste discharged into the river, as well as the wrong attitude of the community, considering the river as a free area and can accommodate waste. Therefore, household waste management efforts can be carried out through a waste reduction approach with the concept of Reduce, Reuse, and Recycle (3R) or reduce, reuse, and recycle to achieve zero waste. This effort is carried out by involving the participation of the community and other stakeholders as regulated in Law no. 32/2009 concerning Environmental Protection and Management (UUPPLH), which can be realized in the form of increasing awareness and ability in environmental protection and management.

This article aims to analyze the involvement of the Cikapundung sub-watershed community in efforts to maintain river areas (conservation). The analysis was carried out by describing: (1) the condition of waste and waste in the upstream, middle and downstream of the Cikapundung Sub-watershed; (2) community activities in reducing waste and household waste through the application of Reuse, Reduce, and Recycle (3R); (3) factors related to the application of 3R by respondents; and (4) the impact of implementing 3Rs and strategies to increase community participation in the conservation of the Cikapundung sub-watershed.

Literature review

Community participation in environmental care

The production of waste is increasing every day due to an increase in the number of products and people's consumption patterns. The level of disaster risk in an area can be seen from the level of environmental damage that occurs in the area. Environmental damage can occur because of waste that is allowed to accumulate and cannot be fully processed by humans. The problem of household waste is one of the things that must be resolved to preserve the environment so that the waste management program needs to be intensified.

The increase in the volume of waste can be reduced by reducing and controlling its source through community empowerment. According to Faizah (2008), in managing towards zero waste, the process of sorting and processing must be carried out at the source of the waste, either simultaneously or sequentially with the waste container. Waste management starts from the location of the waste generation or the waste producer, namely the household. Community empowerment programs require community involvement in the form of participation. Participation functions as a partnership in waste management. Community participation can be created if mutual trust and mutual understanding between government apparatus and institutions or community members can be turned on.

Community participation is the right of the community to participate in decision making in the stages of the development process, starting from planning, implementing, monitoring, and preserving the environment. Here, the community is not only the recipient of facilities and benefits but also the subject of sustainable development (Dewi, Fandeli, & Baiquni, 2013). Direct participation is the participation of individuals in activities that are directly related to household waste, while indirect participation can be in the form of sharing ideas and contributing to program planning. In the implementation of participation, the benchmark of member activity can be seen from the extent to which members contribute to running the program.

With development planning that involves community participation. It means, the needs and environmental situation of the community have been considered. If the program involves community members, then the community will realize that the program created is an important program for meeting the needs of the community itself. This is important in the next stage of the process, where the community will implement the planned program. If they feel they own and feel the benefits of the program, it is hoped that the community can actively supervise the program, so that deviations can be avoided. Cohen and Uphoff (1977) divide participation into several stages, namely as follows: 1) The decision-making stage (planning); 2) The implementation stage is the most important stage in development, because the essence of development is its implementation; 3) The stage of enjoying the results, which can be used as an indicator of the success of community participation in the planning and implementation stages of the project; 4) Evaluation stage, community participation at this stage is considered as feedback that can provide input for improving the implementation of the next project. Amin *et al.* (2018) also revealed that the concept of participation can be measured through the planning stage, implementation stage, and utilization stage. Community activity at each of these stages determines the level of community participation in the program.

According to Pretty & Guijt (1992), there are three primary environmental care should be available when such actions to be implemented toward sustainable development. The three aspects include "(i) the meeting of basic livelihood needs, (ii) the protection and optimal use of the environment and natural resources, and (iii) the empowering groups and communities for self-development." In relation to this, the research by Ankesa *et al.,* (2016) found that a community group consists of women has actively involved to care the environment through 3R. The 3R managed by the group successfully meets the need of the community for the benefits of clean and healthy environment to live.

Community implementation of 3R and sustainability

Waste is something that is not used, not used, not liked or something that is thrown away that comes from human activities and does not happen by itself. Community activities in implementing the 3R include handling household waste and waste, reuse of generated waste, domestic waste processing, processed waste products that can be sold, waste sorting, and waste disposal behavior.

Waste Management Law Number 18 of 2008 states that waste is the residue of human daily activities and/or from natural processes in solid form. According to Law-18/2008, it is explained that the 3R are the basis for handling to reduce waste generation. The 3R in question are:

- Reduce: efforts to reduce the formation of waste, including saving or selecting materials that can reduce the quantity of waste and the hazardous nature of the waste (restriction of waste generation)

- Reuse: efforts made if the waste is reused without undergoing a new process or transformation. - Recycle: residue or waste that is left or cannot be used directly, then processed or processed to be utilized, both as raw materials and as a source of energy (Damanhuri *et al.* 2010)

Hadidi et al., (2020) report that the implementation of 3R to reduce solid waste in municipality has been implemented by engaging the local community. The activities have benefit in terms of reducing waste, save energy, conserving natural resources, limiting pollution, and supporting several sectors of the economy. The approaches used to increase the community initiatives in 3R include awareness raising and education to residents. Similar approaches have been conducted in ecovillage program in West Java Province (Amanah & Kartika, 2021). Behavior in waste processing and management is closely related to knowledge about the use of organic waste, mobilizing the community, and cultivating clean living behavior. The participation of cadres and community leaders in cultivating a clean life really supports the realization of a beautiful environment. In addition, the mobilization of the community to actively participate in the program needs to be intensified so that the Reuse, Reduce, and Recycle programs can be run continuously.

Methods

The research was conducted in three areas of Cikapundung sub-watershed, namely in upstream, middle stream, and downstream areas (Table 1). The research respondents involved the people living along the sub-watershed with a total of 196 respondents.

Table 1 Research respondents in the upstream, middle stream, and downstream Cikapundung Sub-watershed

No	Location	Respondents		Description
		male	female	
A	Sunten Jaya Village			
	RW 09	11	11	▪ Upstream ▪ Rural area
	RW 10	11	11	
	RW 13	11	11	
B	Lebak Siliwangi Village			▪ Middle stream ▪ Urban area
	RW 06	11	11	
	RW 07	10	10	
	RW 08	11	11	
C	Dayeuh Kolot Village			▪ Downstream ▪ Transition of rural-urban
	RW 04	11	11	
	RW 05	11	11	
	RW 09	11	11	
	Sum	98	98	

Note: based on sites used by Amanah *et al*., 2015

The research data covers three aspects, namely: (1) the condition of waste in the upstream, middle, and downstream of the watershed, (2) community activities in 3R as well as the efforts that have been made in river conservation, (3) community characteristics in three sites in relation to handle waste.

Data were obtained through interviews, in depth interviews, observations and secondary data collections from related organizations. Focus group discussions and round table discussion activities were held to learn various perspectives from the informants. The key informants included community leaders in three sites, change agents, representatives from the government and civil society organizations. The researchers analyze the data qualitatively and use a descriptive statistical analysis to show the proportion of the community in 3R practices.

Results and discussions

Community activities and their impact on the environment

The types of waste that are often found in every household include organic and inorganic waste. This waste can cause problems and can also be useful in strengthening the economic life of the community. The results showed that more than half of the households in the three research locations produced 0.5 kg of waste/day (Table 1). However, it was still found that 21.2 percent of

households in Suntenjaya Village and Dayeuh Kolot Village produced more than 1 kg/day of waste. The problem of waste must receive special handling, because the longer the volume increase and the composition becomes more diverse (Haryono and Rohmad, 2013). If not handled properly, these wastes will not only become useless piles, but they will also harm the health of residents.

The types of waste produced by households are quite diverse and all households (100%) in the three research locations produce types of plastic waste. Other types of waste generated are cans, paper, and food scraps. The results of FGDs show that the type of waste that is mostly produced is inorganic waste, especially plastic, even now, glass shards from electronic waste are starting to be found. This is in accordance with the research results of Yeti *et al.,* (2012) that the type of waste that is often found in households is inorganic waste.

Table 2 Household profile by domestic waste handling in three areas of the Cikapundung sub watershed

Description	Category	Location					
		Upstream		Middle stream		Downstream)	
		n	%	n	%	n	%
A lot of household waste is generated	<0.5 Kg	17	51.5	16	51.6	19	57.6
	0.5-01 Kg	9	27.3	9	29	7	21.2
	>1 Kg	7	21.2	6	19.4	7	21.2
	Total	33	100	31	100	33	100
Types of household waste generated	Plastic	33	100	31	100	31	93,9
	Can	2	6,1	2	6,5	2	6,1
	Paper	9	27,3	10	32,3	10	30,3
	Leftovers	14	42,4	12	38,7	12	36,4
	Other	0	0	0	0	0	0
The most waste generated	Plastic	33	100	27	87.1	28	84.8
	Paper	0	0	0	0	5	15.2
	Leftovers	0	0	4	12.9	0	0
	Total	33	100	31	100	33	100
Where do you throw your household trash?	River	1	3	2	6.5	1	3
	Public trash can	2	6.1	24	77.4	13	39.4
	Collected by the Agent	0	0	5	16.1	8	24.2
	Own trash can	30	90.9	0	0	11	33.3
	Total	33	3	31	6.5	33	3

Description	Category	Location					
		Upstream		Middle stream		Downstream)	
		n	%	n	%	n	%
Do you burn household waste?	No	2	6.1	30	96.8	11	33.3
	Yes	31	93.9	1	3.2	22	66.7
	Total	33	100	31	100	33	100
Have you ever thrown out electronic waste?	No	14	42.4	9	29	6	18.2
	Yes	19	57.6	22	71	27	81.8
	Total	33	100	31	100	33	100
Where to throw e-waste?	Never	14	42.4	9	29	6	18.2
	River	5	15.2	2	6.5	0	
	Public Trash Can	5	15.2	11	35.5	20	60.6
	Collected by the Agent	7	21.2	8	25.8	7	21.2
	Others	2	6.1	1	3.2	0	0
	Total	33	100	31	100	33	100
Liquid Domestic Waste							
Liquid waste comes from any activity	Take a bath	33	100	31	100	33	100
	Washing clothes	33	100	30	96.8	33	100
	Washing groceries	28	84.8	24	77.4	25	75.8
	Washing vehicles	9	27.3	9	29.0	17	51.5
Materials used for bathing and washing	Detergent	30	90,9	30	96,8	33	100,0
	Soap	31	93,9	31	100,0	32	97,0
	Shampoo	31	93,9	25	80,6	31	93,9
	Bleach	4	12,1	9	29,0	10	30,3
	Carbolic	4	12,1	13	41,9	15	45,5
Materials used to mop the floor	Detergent	13	39.4	15	48.4	9	27.3
	Carbolic	4	12.1	8	25.8	17	51.5
	Floor Cleaning Fluid	14	42.4	8	25.8	7	21.2
	Others	2	6.1	0	0	0	0
	Total	33	100	31	100	33	100

Description	Category	Location					
		Upstream		Middle stream		Downstream)	
		n	%	n	%	n	%
Where to dispose of the liquid waste?	Liquid waste storage	0	0	0	0	1	3
	River	24	72.7	19	61.3	11	33.3
	Drainage (sewer)	9	27.3	12	38.7	21	63.6
	Total	33	100	31	100	33	100
Ownership of a septic tank	Haven't	14	42.4	27	87.1	12	36.4
	Have	19	57.6	4	12.9	21	63.6
	Total	33	100	31	100	33	100

Source: Authors

Upstream area. Most (90.9%) households in Suntenjaya Village dispose of their waste in their own garbage dump. According to the results of the FGD in Suntenjaya Village, households generally dispose of their garbage in their own yard or in the garden near their house and then burn the waste. The results of quantitative data analysis also show that almost all households (93.9%) stated that they burned household waste. According to Ananda et al. (2013) for rural areas in general, waste can be managed by each family without the need for a TPS or TPA. Rural household waste is generally recycled into fertilizer. In addition, it is necessary to destroy and manage waste by burning it and turning it into fertilizer. The results of Suhardjo's research (2002) show that most of the respondents manage their waste by burning. In the case of Lebak Siliwangi Sub-district, most of the households (77.4%) throw their garbage into the public trash can, even 6.5 percent of the households throw their garbage into the river. Therefore, almost all households (96.8%) in Lebak Siliwangi Village never burn household waste. For households in Dayeuh Kolot Village, they have the habit of throwing garbage into the public trash can (39.4%) and their own trash can (33.3%), so that there are 66.7 percent of households that burn garbage and 33.3 percent who never burn household waste. The results of research by Haryono and Rohmad (2012) state that residents who have large yards, handle waste themselves in the traditional way by making excavations in their yards. Suhardjo's research (2002) states that there are still people who behave less positively in littering, some even throw their garbage into the river, causing flooding during the rainy season.

Most of the households in the three sites reused the generated waste. The households generally use plastic waste to become useful items such as bags, doormats, tissue holders and wallets. In Suntenjaya Village, it was found that as many as 48.5 percent of households never used waste. This number is the highest compared to Lebak Siliwangi Village and Dayeuh Kolot Village. Research

results Riswan *et al.*, (2011) the factors that influence household behavior in waste management are education and income. According to Neolaka in Riswan *et al.*, (2011) low-income households are less concerned about the environment. Poor households still think about basic needs, such as clothing, and food, not yet think of caring for the environment.

Based on the results of the FGD, it is now common to find broken glass which is household electronic waste. The results of data analysis show that most households have disposed of electronic waste, especially in Lebak Siliwangi Village (71%) and Dayeuh Kolot Village (81.8%). The highest percentage of households in Lebak Siliwangi Village (35.5%) and Dayeuh Kolot Village (60.6%) disposed of electronic waste in the public trash can, while in Suntenjaya Village it was picked up by officers (21.2%).

In addition to solid domestic waste, households also produce liquid domestic waste. Most households (more than 75%) produce liquid waste from bathing, washing clothes and washing food. Almost all households (more than 90%) use soap for bathing, detergent for washing, and shampoo for washing hair. Other materials used by a small number of households for washing are bleach and carbolic acid. On the other hand, the materials used for mopping varied considerably between households in the three research locations. The highest percentage (42.4%) of households in Suntenjaya Village used floor cleaner for mopping, and 39.4 percent used detergent. The materials mostly used for mopping by households in Lebak Siliwangi Village are detergent (48.4%), carbolic acid (25.8%) and floor cleaning fluid (25.8%). Carbolic acid is a mopping material that is widely used by households in Dayeun Kolot Village (51.1%), the other ingredients are the same as in other urban villages, namely detergent and floor cleaning fluid. Overall, the materials used for mopping at the three research sites were detergent, carbolic acid and floor cleaning fluid. The highest percentage of households in Suntenjaya Village (72.7%) and Lebak Siliwangi (61.3%) disposed of liquid waste into the river, while in Dayeuh Kolot Village the highest percentage (63.6%) of households disposed of liquid waste into drainage channels (sewers). River water contaminated with detergent waste is bad for animals and plants in the rivers (Evans *et al.,* 2018).

Respondent households in Suntenjaya Village (57.6%) and Dayeuh Kolot (63.3%) have a septic tank, while 87.1% of respondent households in Lebak Siliwangi Village do not have this facility. There are still 42.4 percent of households in Suntenjaya Village and 36.4 percent of households in Dayeuh Kolot that do not have a septic tank. Most of the households that do not have a septic tank dispose their liquid waste into the river.

Sunten Jaya village does not have a final waste disposal site. Domestic waste management is done independently and has not been handled specifically. All types of waste are still combined into one, both plastic waste and glass waste. At the household level, the wife plays a role in

managing domestic waste and cattle farm waste. Domestic waste management is generally burned for cooking. Residents do not have a septic tank, so the liquid domestic waste discharged from the bathroom is directly dumped into the river. The household waste produced is mainly plastic. Used bottles and the like are usually sold, the rest is burned. Some residents still throw garbage into the river. In 1999 there was once a business making handicrafts from plastic waste (coffee wrappers) which were made into bags and wallets, but in terms of marketing, production stopped.

Since the cattle breeding business developed rapidly around the 1990s, the Cikapundung River began to be polluted with cattle manure waste. One cow produces about 15 kg/day of manure. Based on information from informants it's reported that in year 1998, the waste generated by farmers from RW 13 and RW 08 reached 10 tons/day and was discharged into the Cikapundung River, an average of around 400 cows, especially during the rainy season. During the dry season, cow dung is dumped on the grass to keep it green.

The processing of cattle manure is carried out by introducing the manufacture of home biogas and compost (organic fertilizer) from cattle manure. In addition to reducing river pollution, biogas can be used for cooking. This biogas can absorb 25% of the total manure produced, the rest is made organic fertilizer. Few farmers make biogas. Some households that already have biogas buildings near the stables have also not installed pipes to distribute it to their homes due to cost constraints. The estimated cost of constructing a household-scale biogas pipe installation ranges from IDR 2 up to 3 million (early 2000-ies). This shows that community participation in processing cattle manure (waste treatment program) is an effort to overcome river pollution. Community participation is introducing household biogas and compost from manure. Community participation in the implementation is still relatively low because only a small number of farms produce biogas.

To support the processing of manure from cattle farming business, the government then provides infrastructure assistance in the form of a compost house. The areas that received assistance from this compost house were RW 09 and RW 10 @ IDR 300 million, RW 13 and RW 12 @ IDR 200 million. The assistance obtained in relation to the compost house for the management of cow dung waste includes building a compost house, waste treatment equipment, and operational vehicles including fertilizer carriers. The existing government-assisted compost houses are not made from garbage, but as an effort to accommodate livestock manure. There is also an individual composting house that utilizes vegetable scraps mixed with chicken manure. Although the raw materials for making organic fertilizers are abundant, it is not guaranteed from a marketing perspective so that it has not developed properly. So that livestock waste can be handled and the Cikapundung river keeps clean, partnerships with both the government and the private sector are needed for the marketing of organic fertilizers.

Middle stream area. Waste management in Lebak Siliwangi Village has been carried out collectively. For management, there is a garbage officer who takes it to residents' homes to be taken to the TPS. The amount of fees for waste is adjusted to the ability of the residents, which is around IDR 5,000-10,000/month, not all residents pay for it.

Most of liquid domestic waste (bathroom waste) is still discharged into the Cikapundung River. For the disposal of domestic liquid waste, there is a special pipe to channel waste so that it does not enter the river, but it is limited and only a small number of residents have used it.

Processing of waste into a product that has economic value has not been done much. Especially for waste processing, it has been accommodated in the Community Rukun Forum under the Environment section. This RW forum already has a waste counting and processing tool from the P2KP Program, but in its operation, it faces several obstacles, including the lack of citizen participation in sorting waste and the absence of a waste collection site to be processed. The forum has submitted a proposal for a place to Sabuga ITB, but not yet been approved. Domestic waste management programs that have existed are composting, sorting organic and non-organic waste but there has been no follow-up. This shows that community participation in the implementation stage is still low. So that further efforts are needed to be able to mobilize the community to participate in domestic waste management programs.

Downstream area. Population growth and many industries encourage changes in people's lifestyles. This can be seen from the waste generated mostly in the form of plastic waste. The management of household waste in Dayeuh Kolot Village is generally burned and disposed of/brought to the Disposal Site (TPS). The availability of TPS is not evenly distributed in all Community Neighborhood (RW). From the existing TPS, around 30% of the waste is burned and 50% is transported to the TPA by the government. At TPS RW 02, 03, 04, and 05, officers separate plastic waste before it is burned. The problem is that during the rainy season the waste cannot be burned so that the capacity of the TPS is not sufficient. The problem with waste management in industrial areas such as Dayeuh Kolot is the availability of land for Final Disposal Site (TPA).

Each RW has its own policy regarding waste management in its area. Waste management in RW 04 is done independently. Each household is charged a fee of IDR. 5,000.00/month which is used for the operation of waste transport equipment and cleaning staff. In RW 05, some residents pay for cleaning staff, and some do not. Household waste that is not picked up by officers is usually burned. Waste management by cleaning staff is also carried out in RW 14, 03, and 02. Sorting of organic and non-organic waste is only done individually, such as in RW 05. Domestic waste that can still be recycled is usually sold by residents to collectors. In this case, the role of RT/RW in domestic waste management is felt to be lacking.

The waste that flows to the river in Dayeuh Kolot Village also comes from textile factories in this area. There are seven textile companies operating in Dayeuh Kolot Village. The company is a middleclass company which when there is a flood its production capacity decreases. To keep producing, the factory builds ditches and uses a water suction device.

The waste generated by the textile factory is solid waste in the form of cloth residue and liquid waste. Solid waste is released twice per week for sale to reservoirs outside the village. Local people do not have access to be able to use the leftover fabric from the factory. On the other hand, people get liquid waste that is thrown away, especially when it rains heavily. As a result, the water on the highway becomes colorful and during the dry season the river becomes thick due to waste. There have been petitions from district-provincial governments and civil society organizations regarding liquid waste being discharged by factories, but there has been lack of changes occur.

Government programs related to waste management are in the form of sorting waste into 3 parts, namely: organic, plastic, and glassware including iron. The program has not been implemented properly. Sometimes the waste at the household level has been separated, but in handling the garbage at the garbage collector, it is not separated (reassembled). Plastic waste is usually separated because there is a shelter to sell it. So far, there has been no program from the government, NGOs, or the private sector regarding proper waste management for the community. The knowledge that peoples have is that plastic and glass/glassware can be sold.

The information through the media and reliable sources regarding waste management is still lacking. If it is estimated that 1 person disposes of 0.5 kg/day of waste, then the average population of ±14,000 produces about 7 tons/day. This is a potential use of waste as a source of income. In addition, the availability of abundant grass on river embankments during the rainy season also has the potential to be used as compost. With the support of the Family Welfare Program (PKK) and Youth Cadre in the village (Karang Taruna) institutions that have been active in disaster management, this is an opportunity in the management of domestic waste that has economic value. The Dayeuh Kolot Village Government plans to direct Bandung District to propose the Village Fund Budget (ADD) funding for domestic waste to be managed by youth organizations. The Dayeuh Kolot Village Government proposes that the program can be in line with the activities of universities, especially IPB University.

Community programs and institutions for sub-watershed conservation efforts

Environmental conservation efforts are carried out as an effort to adapt and mitigate climate change. Changes that are felt related to climate include a long rainy season, a shorter dry season. Symptoms of climate change include erratic weather conditions, heat, and rain. The consequences are coughs and colds. The impact felt by farmers is a decrease in the quality and quantity of vegetables produced due to erratic weather.

Reforestation of critical land as an environmental conservation effort has been carried out since year 2010, from the 75 hectares target, 25 hectares have been realized on community-owned land by planting coffee trees and wood. The program was implemented by the Air Heaven Group which received assistance from coffee seeds for the Environmental Service Fee activity from PT. Aetra Jakarta. Previously, people considered it taboo to plant large trees in vegetable fields. The reason is that vegetable production can decrease due to lack of sunlight. The benefits that are felt after there is reforestation other than as a source of income, when it rains there are not too many puddles of water and when it is hot it becomes shady. The harvested coffee is then sold to middlemen at a price of IDR 10,000/kg after drying for 4 hours. Dried coffee costs up to IDR 25,000/kg.

The concept of environmental services promoted by the Air Heaven Group is "downstream care, upstream planting and caring". Air Heaven Group has a group of 35 people. This group is also a service provider who receives compensation or payments for environmental services from the use of water in the downstream area. Another group that also exists in Sunten Jaya is the "Hijau Lestari" field school group which teaches waste sorting. Plastic waste is used to make handicrafts (bags), but the activities are discontinued due to problems in product quality and marketing. Table 3 shows some programs related to the environment in Suntenjaya Village.

Table 3 Community empowerment programs related to the environment in Suntenjaya village

Programs name	Source of Funding	Executor	Stakeholder	Outputs
Conservation Village (Water Heaven)	PT Aetra Jakarta	Farmer groups in RW 14 and 05	NGO YPSM (Citarum Care Foundation), West Java Environmental Agency, Farmers	Planting 25,000 coffee trees on 25 hectares of land. Planting 3000 shade trees
Green long-life (*Hijau Lestari)*	Civil Society Organization (CSO) *Jendela Alam*	Village community RW 07 and 16	Village government	environment-based early childhood education, Art, Waste utilization.

Programs name	Source of Funding	Executor	Stakeholder	Outputs
Culture and environmental conservation (*Budaya dan konservasi lingkungan*)	PT. Kalbe and CSO	Masyarakat RW 09, 10	Private sector, Village government, Association of municipal government, Police Chief.	organic fertilizer, reforestation, cultural preservation.
Biogas	Government (Ministry of Energy and Mineral Resources), province) and civil society organizations	Villagers	Community and village government	Utilization of household waste and reduce waste
Clean Friday (*Jumat bersih*)	Self-funding from community	Villagers	Community	The environment becomes clean and healthy
Integrated Healthcare Center	Government	Cadre	Community, village midwifes	80% of parents consult their children's health to the integrated health services unit (*Posyandu*), nutrition milk supply, Program of Clean Living and Healthy, elderly check-up, military service check-up.

Source: Authors

In relation to waste management and waste disposal into the Cikapundung River as an environmental conservation effort, several programs and activities have been carried out by the West Bandung Regency Government, namely from year 2009 to date:

2009: Clean River Program (Prokasih) was implemented, and 10 units of biogas reactor were built for cattle breeders.

2010: construction of 20 biogas reactors.

2011: Clean River Program (Prokasih) in Kayu Ambon area.

2012: Clean River Program (Prokasih) in the Maribaya area, construction of 182 biogas reactors in collaboration with the West Java Provincial Government. West Bandung Regency has also conducted socialization on environmental management, especially cow dung waste in Sunten Jaya, Cibodas, and other cattle breeding areas.

2013-2014 – Government of West Java through Agency for Environment launched Ecovillage Program

2014-2019 – the ecovillage program was implemented in more than 150 villages in West Java with the principle of "nature take care of us, we take care of nature" or "*alam jaga kita, kita jaga alam*"(Indonesian Language)

2019-to date – the communities in various district and cities in West Java Province continually preserve the environment based on community initiatives.

The form of the Cikapundung River conservation effort in Lebak Siliwangi Village is carried out by the formation of communities that care about the Cikapundung River. The activities of the Cikapundung river community began to be active three years ago, which was initiated by former the Deputy Mayor of Bandung, Ayi Vivananda. The various communities that were formed along the Cikapundung River in the city of Bandung are in one container Baraya (meaning: brother). Within 2 weeks, 4 Cikapundung caring communities were formed in Lebak Siliwangi Village, namely: Zero 08, *Kumang*, *Katak*, and *Entog* communities. Community members are voluntary, age and gender are not restricted, open to anyone who is interested. In essence, the community is tasked with supervising the community, so they don't throw them into the river. If there are residents who are found throwing garbage into the river, they will receive a warning. So far, about 80% of the community has complied with the ban. The community had received assistance in the form of Rp 40 million in cash, but the management of the funds was unclear.

Residents along the Cikapundung River in RW 06, 07, and 08 also participated in *papalidan* (rafting) to clean up trash in the river. It was originally scheduled for the first Saturday of every month to clean up trash independently. Furthermore, *papalidan* is carried out by considering the condition of the river, the water is not large and does not recede. However, since the last five

months there has been a vacuum in view of the increasing rainfall and the increasing volume of river water.

Informants assessed that the activities that have been carried out so far have not been successful because the social spirit of the community is still lacking. Only the riverside community really cares. The community in general still joins in if there are activities. The key to successful activities is self-awareness and support from the government. The Clean Cikapundung program has existed since the previous government but was only implemented when Pak Ayi took office. A better Cikapundung River has been a community need for a long time. It is proven that when there are community activities, the community responds immediately, and socialization is quite easy to do informally. The important thing is that the objectives of the activity are clearly communicated to the community.

One of the efforts to overcome flooding is the existence of a 2.5 km Citarum River normalization/dredging program in 2012-2014. Apart from normalization, there is no other program from the government because it is related to the central authority and the state budget. In 2009 it was proposed to build a sluice gate at 2 points of water entry sources which caused annual flooding in Dayeuh Kolot Village, but this has not been realized. It is planned that the construction of the floodgates will be realized after the river normalization program is completed in 2014. With the floodgates, it is hoped that the flood intensity will be reduced. If the Citarum River is overflowing, it can be prevented from entering the village by closing the floodgates. On the other hand, water from the community can be siphoned off and channeled to the Citarum.

"We care and will share" is the motto of Dayeuh Kolot Village, especially in flood prevention. The culverts have been built by the government. River normalization is also needed and more importantly all parties must work together to protect the environment.

Regarding climate change, the informants observed natural phenomena such as weather, floods, heat, and increasingly erratic rains. Knowledge of climate change is understood to be very important for maintaining health such as preventing asthma relapse due to extreme weather and preventing diarrhea during floods. The community understands what can be done in response to climate change, such as protecting their own environment by, among other things, properly disposing of garbage, cleaning gutters, and washing hands with soap. On the other hand, there are still many parties who have not implemented this properly and correctly.

Table 4 Percentage of respondents in 3R practices based on demography factors

Demography Factors	Reuse (%)		Reduce (%)		Recycle (%)	
	No	Yes	No	Yes	No	Yes
Education						
Incomplete primary school	33,3	**66,7**	16,7	**83,3**	33,3	66,7
Elementary school	50,0	50,0	53,1	46,9	59,4	40,6
Junior High school	59,4	40,6	56,3	43,7	53,1	46,9
Senior High School	52,0	48,0	52,0	48,0	48,0	52,0
University/College	50,0	50,0	100,0	0	0,0	**100,0**
Sex						
Male	55,1	44,9	55,1	44,9	49,0	**51,0**
Female	50,0	**50,0**	50,0	**50,0**	54,2	45,8
Expenditure (in 1 year)						
< 12 million	61,9	38,1	66,7	33,3	57,1	42,9
12-24 million	50,0	**50,0**	51,9	48,1	50,0	**50,0**
> 24 million	50,0	**50,0**	41,7	**58,3**	50,0	**50,0**
Age						
< 25 Tahun	50,0	50,0	50,0	50,0	50,0	50,0
25-40 Tahun	60,0	40,0	48,6	**51,4**	48,6	**51,4**
> 40 Tahun	48,2	**51,8**	55,4	44,6	53,6	46,4
Access of Information						
Unable to access	80,0	20,0	60,0	40,0	80,0	20,0
Lack of access	52,5	47,5	50,0	**50,0**	52,5	47,5
Access	50,0	**50,0**	55,8	44,2	48,1	**51,9**

Based on the level of education, most of the people who reused household waste did not finish elementary school (66.7%). Most of the people who reduce and dispose of waste (reduce) are also educated and did not finish elementary school (83.3%). Different things are shown by people who do waste processing/recycle (recycle) where most of the people have tertiary education. People who have higher education tend to be able to seize opportunities for the economic value of waste processing/recycling.

Based on gender, women tend to reuse and reduce waste compared to men, each by (50%). Different things are shown by people who process waste/recycle (recycle) where most of them are men (51.0%). Men tend to recycle waste because there is still a perception that activities that have economic value tend to be carried out by men.

Based on the level of expenditure (within 1 year), the tendency is that the greater the community's expenditure, the community tends to carry out activities related to the 3Rs (reuse, reduce, and recycle). Higher expenses will encourage someone to look for alternative jobs/

businesses to increase income to meet their daily needs. One of the efforts made is by reusing and processing waste/recycling (recycle) so that waste that was initially not valuable becomes valuable (has a selling value).

Based on age, people who carry out 3R activities tend to be people who are over 25 years old. The more mature a person is, the tendency to have more concern for the environment and the tendency to be able to seize economic opportunities from waste.

Based on access to information, the more access a person has to information, the more likely that person is to carry out 3R activities. The 3R information can be obtained through various information media, both printed and electronic. The tendency is that most respondents obtain media information related to the 3Rs, especially waste processing/recycle (recycle) through television media.

Strategies to increase community participation in the conservation environment

The sustainability of the 3R in terms of social, economic, and environmental aspects has the prospect to continue to be implemented and developed. The sustainability of this program is very dependent on the level of community participation and the performance of cadres and the support of community leaders as well as the government and the private sector. Coordination and the role of stakeholders are needed so that the program can run synergistically.

To increase community participation, this can be done by activating 3R actions in a systematic and sustainable manner, with benefits for all elements of society (education, health, income, social security), activating Community Learning Activity Center, Posyandu, Posdaya, and other groups in instilling concern for the community environment through socialization and waste management practices that can be of value to increase people's income (Table 5).

Table 5 Role of Stakeholders to Promote 3R Practices

No.	Stakeholder	Role
1.	Learning Activity Center including Posyandu, PKK, Posdaya	Provide socialization regarding the 3R program (science and practice of waste management
2.	Cadre and environmental change agents	Facilitating programs with the community
3.	Community leaders	Help increase public awareness to get involved and help strengthen programs with support from the government
4.	Government	Assist with program procurement and facilities
5.	Media	Increase public awareness about the importance of waste management and protecting the environment through informative and persuasive information
6	Private sectors	Investing for the better environment, waste processing technology, funding

Community elements, especially cadres and community leaders are very crucial in establishing partnerships both at the site and central levels with local and external supports. All forms of efforts to protect the environment through the 3R can also be intensified through the media information so that it can raise awareness in the community. Based on this, the following mapping analyzes the role of stakeholders in increasing community participation in the 3R.

To preserve environment including the implementation of 3R by the wider community, each institution must develop strategic action plan (from short term to long term plan). The plan should consider the specific characteristics of the community, nature, environment, and socio-economics aspects.

Conclusion and recommendation

The community in three areas of Cikapundung sub-Watershed implement various 3R activities, however majority of the households still produce 0.5 kg of waste/day. The types of waste produced are varied and 100% of households in all locations produce plastic, cans, paper, and food waste. Most households in the central area of the Sub-watershed reuse waste into products that have economic value, such as bags, doormats, tissue holders, and wallets. Greening of critical land as an environmental conservation effort has been carried out since year 2010, from the 75 hectares target, 25 hectares have been realized on community-owned land by planting coffee trees and wood. In addition, the form of the Cikapundung River conservation effort in Lebak Siliwangi Village is carried out by the formation of river care groups.

The application of 3R by the community must be improved so that the community is involved in every stage of participation. To be able to increase community participation, this can be done by activating 3R actions in a systematic and sustainable manner, with benefits for all elements of society (education, health, income, social security), activating Community Learning Activity Centers, Posyandu, Posdaya, and other groups in instilling concern for the community through socialization and also waste management practices that can be of value to increase people's income, and using media to increase the awareness of the community.

Strategy to increase community participation in 3R should be based on community needs. Meaning that the efforts for environmental protection should be started with understanding community needs, problems in the field, and increasing community engagement. In addition, multi-stakeholder support from the site, champion, local level, and support for the procurement of facilities, and infrastructure is urgently needed. The government and the private sectors should ensure availability of facilitators or environmental change agents working with the community in 3R. The 3R has contribute to the quality of environment, however, further synergized actions are needed as mentioned above.

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A review of frameworks for evaluating online corporate sustainability communications

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Abstract

This paper aims to examine whether communication has been considered to be one of the main strategic areas of corporate sustainability by examining recent frameworks for evaluating online corporate sustainability communications. A meta-analysis and a thematic analysis have been conducted on empirical articles that utilize online sustainability communications evaluation frameworks that have been published in journals on the SCOPUS database from 2016 to 2020. Keywords used to obtain relevant articles include "sustainability communication," "sustainable communication," "communicating sustainability," and "sustainability reporting." The scope (industries/countries), theories, dimensions, indicators, research methods, and data analysis methods (scoring of sustainability communications) of the online sustainability communications frameworks in these articles are discussed. The majority of frameworks used the triple bottom line (social, environmental, and economic dimensions) to evaluate corporate sustainability communications along with various additional criteria for assessing information regarding sustainability as well as online features that facilitate stakeholder engagement. Most studies evaluated corporate sustainability by conducting the quantitative content analysis of corporate websites by using binary/dichotomous scoring to identify the presence and absence of each indicator of sustainability communications. After analyzing the findings, this paper conceptualizes the role of sustainability communication as the blood vessel that nourishes all processes of strategic actions of corporate sustainability in a sustainable economic strategy. This review of online sustainability communications evaluation frameworks could provide directions for future research endeavors on analyzing corporate sustainability communications as well as provide implications for sustainability practitioners to acknowledge aspects that influence stakeholders' evaluations of sustainability communications and develop communication strategies accordingly.

Keywords: corporate communication, corporate sustainability, evaluation framework, stakeholders, sustainability communication

Introduction

In the recent decade, significant surges in business sustainability practices and consumer demands for sustainability have been evident. According to the McKinsey & Company Global Survey (2014), the percentage of chief executive officers (CEOs) that strategize sustainability as the top priority doubled from 2012 to 2014. Subsequently, the NYU Stern Center for Sustainable Business found a 29% increase in the sales volume of sustainability-marketed products from 2013 to 2018 (Kronthal-Sacco & Whelan, 2019). Leaders, managers, and entrepreneurs need to meet the expectations of stakeholders by contributing to sustainable development not only at organizational levels but also at societal levels (Schaltegger et al., 2016).

In business contexts, **sustainability** was originally defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environmental Development, 1987, p. 41). At the beginning of the 21st century, the conceptualization of the sustainable marketing era emerged as a holistic approach to creating and communicating sustainability. **Sustainable marketing** was initially defined as "a process of planning, implementing and controlling the development, price-formation, and distribution of a product in a way that guarantees adherence to the following three criteria (1) satisfying consumer needs; (2) guaranteeing the achievement of the organization's goals; (3) the whole process being in harmony with the ecosystem" (Fuller, 2000, as cited in Katrandjiev, 2016) and "to meet the full environmental costs of production and consumption to create a sustainable economy" (Peattie, 2001, as cited in Dangelico & Vocalelli, 2017).

At the present time, contemporary conceptualization and operationalization of **corporate sustainability** across the globe tend to be based on the **triple bottom line** (Basera, 2016; Bittner-Fesseler & Weicht, 2020; Sivarajah et al., 2020). Coined by John Elkington (1994), the triple bottom line (TBL) comprises the 3P's: people (social value), planet (environmental value), and profit (economics value) (Elkington, 2004). For instance, Morioka et al. (2016, p. 659) defined **corporate sustainability** as the "capacity of firms to contribute to global sustainable development and all the challenges regarding economic, social and environmental interconnections together with short, medium and long term aligned and conflicting demands." Based on contemporary explanations of the TBL from several scholars (e.g., Bain et al., 2019; Basera, 2016; Elkington, 2018; Sivarajah et al., 2020; Slaper, 2011), the present paper defines the TBL dimensions as follows. The **people (social)** dimension refers to corporate practices of treating stakeholders well simultaneously with increasing productivity and appealing to sustainable consumers. The **planet (environmental)** dimension refers to implementations that directly tackle environmental issues, including reductions in carbon footprint, energy usage, and resource consumption. The **profit**

(economics) dimension refers to corporate benefits, especially in the long term, including financial returns and loyal customers acquired.

Scholars and organizations have developed frameworks for evaluating **corporate sustainability** performance, many of which are based on (1) the **Triple Bottom Line (TBL)** dimensions (people, planet, and profit) of Elkington (1994) (e.g. the Global Reporting Initiative – GRI since 1997, the Dow Jones Sustainability Indices – DJSI since 1999, Labuschagne et al., 2005; Govindan et al., 2013), (2) the four **Balanced Scorecard (BSC)** perspectives (financial, internal business, innovation & learning, and customer) of Kaplan and Norton (1992) (e.g. Tsai et al., 2009), and (3) the **Sustainability Balanced Scorecard (SBSC)**, which is the integration of the TBL benefits into the original BSC perspectives (e.g. Medel-González et al., 2013; Nicoletti Junior et al., 2018).

Simultaneously, another current phenomenon in the 21st-century digital era is the shift in **sustainability communication** from the traditional passive one-way communication from organizations to stakeholders to the contemporary dialogic two-way communication with stakeholder engagement through interactive online media, especially via corporate websites and social media (Siano et al., 2016; Sivarajah et al., 2020). The conceptualization of **sustainability communication** emphasizes dialogues and discourses regarding sustainable behaviors and sustainable development (Siano et al., 2016, p. 2). Concurrently, stakeholders tend to be skeptical of greenwash, which refers to exaggerated, ambiguous, or untruthful communication about sustainable practices (Dahl, 2010; Dangelico & Vocalelli, 2017; Siano et al., 2016). Consequences of skepticism about greenwash include mistrust, negative brand images, and avoidance of purchases (Khandelwal et al., 2019; Majláth, 2017; Nguyen et al., 2019). This reflects that it is essential for organizations to deliver authentic and effective **communication** regarding **corporate sustainability** since these influence stakeholders' perceptions and evaluations (Dach & Allmendinger, 2014; Peloza et al., 2012). Nevertheless, frameworks for evaluating online sustainability communications are still limited (Siano et al., 2016), while existing frameworks tend to focus on assessing corporate sustainability performance as previously mentioned.

Consequently, to address this research gap, the present paper contributes to the body of knowledge on online sustainability communications by conducting a meta-analysis and a thematic analysis of existing frameworks that aim to evaluate online communications of corporate sustainability. The purpose of this review is to analyze whether communication has been included as one of the main strategic areas of corporate sustainability. Relevant journal articles obtained from the SCOPUS database in the recent five years from 2016 to 2020 have been examined. This review of online sustainability communications evaluation frameworks could provide directions for

future research endeavors on analyzing corporate sustainability communications as well as provide implications for sustainability practitioners to acknowledge aspects that influence stakeholders' evaluations of sustainability communications and develop communication strategies accordingly.

Methodology

The present meta-analysis employs a systematic review to obtain relevant journal articles regarding online sustainability communications frameworks and presents a thematic analysis that identifies common patterns among the scope (industries/countries), dimensions, indicators, research methods, and data analysis methods (scoring of sustainability communications) of the online sustainability communications frameworks in these articles. Systematic reviews have been conducted by recent reviews in the sustainability and CSR contexts (e.g. Dangelico & Vocalelli, 2017; Golob et al., 2013; Hansen & Schaltegger, 2014) by selecting relevant keywords and database to search for articles followed by manually examining the abstracts and full texts of each article to obtain relevant information.

For this paper, relevant journal articles have been obtained from the SCOPUS database in the recent five years from 2016 to 2020. The SCOPUS database was selected due to its high recognition for credibility, and it was accessed through one researcher's institutional account via Chulalongkorn University Reference Database. The search queries, keywords, and inclusion criteria used are displayed in Table 1.

Table 1 SCOPUS document search queries used and number of results as of January 11, 2021

Search in	Article title, Abstract, Keywords
Date range	2016-2020
Source type	Journal
Document type	Article
Language	English
Keywords for sustainability communication	"sustainability communication" OR "sustainable communication" OR "communicating sustainability" OR ("sustainability reporting" AND communicat*)
Keywords for online	"online" OR "website" OR "social media"
Keywords for framework	"framework" OR "model"
Number of results	15
Irrelevant results	4
Total numbers of articles	11

As shown in Table 1, a total of 11 empirical research articles have been examined in this meta-analysis. Initially, after examining the abstracts and full texts of the 15 articles, four articles were excluded because those studies did not evaluate the characteristics and qualities of online sustainability communications. Subsequently, thematic analysis has been conducted to identify common patterns among the scope (industries/countries), theories, dimensions, indicators, research methods, and data analysis methods (scoring of sustainability communications) of the online sustainability communications frameworks in these articles.

Results and discussions

Among the 11 empirical research articles, three articles (An et al., 2020; Esterhuyse, 2019; Siano et al., 2016) **proposed new** conceptual frameworks and operational models for evaluating online sustainability communications, while the other eight studies assessed online sustainability communications **by using existing** conceptual frameworks, operational guidelines, and various theories. The **scopes, theories, and research methods** of these 11 studies are discussed here below. Table 2 displays the scope of industries that were examined in each study.

Additionally, the three recently proposed models, as well as their contributions and limitations, are examined in further detail in the sub-section entitled ***"Online Corporate Sustainability Communications Evaluation Frameworks: Their Contributions and Limitations"*** prior to summarizing common themes across the 11 studies in the sub-section entitled ***"Thematic Analysis of Frameworks and Suggestions for Further Studies"*** in this paper.

Table 2 Scope of industries

Industries	Number of Articles	Authors
Across various industries	3	(Esterhuyse, 2019; Hossain et al., 2019; Jain & Winner, 2016)
Higher education: universities	2	(An et al., 2020; Zutshi & Creed, 2018)
Festivals	1	(Dodds et al., 2020)
Energy and utility	1	(Siano et al., 2016)
Seaports	1	(Santos et al., 2016)
Apparel: luxury and non-luxury fashion	1	(Kong et al., 2020)
Yarn	1	(Viciunaite, 2020)
Self-adhesive labeling: paper production and processing	1	(Tesařová et al., 2020)
Total number of articles	11	

Concerning the **scope of industries and countries** in the studies, as shown in Table 2, three studies (Esterhuyse, 2019; Hossain et al., 2019; Jain & Winner, 2016) utilized frameworks to examine online sustainability communications **across various industries**, and two studies (Siano et al., 2016; Hossain et al., 2019) examined a **global scale** of companies across various continents and countries. Other studies limited the scope of analysis to **specific industries**: seaports (Santos et al., 2016), energy and utility (Siano et al., 2016), higher education – universities (An et al., 2020; Zutshi & Creed, 2018), luxury and non-luxury fashion (Kong et al., 2020), yarn (Viciunaite, 2020), self-adhesive labeling – paper production and processing (Tesařová et al., 2020), and festival (Dodds et al., 2020), as well as **specific countries**: European countries (Santos et al., 2016; Tesařová et al., 2020), Norway (Viciunaite, 2020), Australia (Zutshi & Creed, 2018), Canada (Dodds et al., 2020), India (Jain & Winner, 2016), Hong Kong (An et al., 2020), South Africa (Esterhuyse, 2019), and cross-cultural studies of Germany and Korea (Kong et al., 2020). This reflects that research on online sustainability communications tends to examine developed countries; hence, developing countries could be explored in future studies.

Furthermore, while the **theories and guidelines** that were used as principles for evaluating online sustainability communications varied among the studies, most studies applied the triple bottom line (TBL) in their evaluation frameworks. This includes studies that utilized frameworks that comprised dimensions and/or indicators that correspond to the environmental, social, and economic dimensions of the triple bottom line along with other additional dimensions and indicators (An et al., 2020; Dodds et al., 2020; Hossain et al., 2019; Jain & Winner, 2016; Siano et al., 2016; Tesařová et al., 2020) and those that used various indicators that were related to communications of social and environmental factors of the triple bottom line (Santos et al., 2016; Viciunaite, 2020). Guidelines that were adopted include the Global Reporting Initiative (GRI) guidelines (An et al., 2020; Jain & Winner, 2016) and the Sustainable Development Goals (SDGs) (Tesařová et al., 2020), both of which comprise the TBL dimensions. Theories that were applied include the legitimacy theory (An et al., 2020; Esterhuyse, 2019), stakeholder theory (An et al., 2020), voluntary disclosure theory (Esterhuyse, 2019), institutional theory framework: The Varieties of Capitalism (Santos et al., 2016), signaling theory (Zutshi & Creed, 2018), symbolic convergence theory (SCT) (Hossain et al., 2019), translation theory (Viciunaite, 2020), and cultivation theory (Dodds et al., 2020). This indicates that many theories have merely been applied to a few studies on online sustainability communications and can still be further applied to develop new conceptual frameworks and operational models.

Table 3 provides a summary of the **research methods** used in each study.

Table 3 Research methods

Research methods	Number of Articles	Authors
Quantitative research		
Quantitative content analysis	5	(Esterhuyse, 2019; Jain & Winner, 2016; Santos et al., 2016; Siano et al., 2016; Tesařová et al., 2020)
Experiment	1	(Kong et al., 2020)
Qualitative research		
Qualitative content analysis	2	(Hossain et al., 2019; Zutshi & Creed, 2018)
Thematic analysis and pattern matching	1	(Viciunaite, 2020)
Mixed methods		
Quantitative content analysis and qualitative in-depth interviews	2	(An et al., 2020; Dodds et al., 2020)
Total number of articles	11	

In terms of the **research methods** used to assess online sustainability communications, as shown in Table 3, the majority of studies conducted content analysis except for two. Specifically, Viciunaite (2020) conducted qualitative thematic analysis and pattern matching, while Kong et al. (2020) conducted experiments to examine consumers' responses to different aspects of online sustainability communications. This reflects that only one study (Kong et al., 2020) analyzed the effects of online sustainability communications from the perspectives of the audience, while 10 studies evaluated online sustainability communications by analyzing the content based on predefined criteria and guidelines. Among the nine studies that utilized content analysis, seven studies used content analysis as the only method for collecting and analyzing data on online sustainability communication, while the other two studies (An et al., 2020; Dodds et al., 2020) used mixed methods by conducting interviews to supplement the content analysis.

Concerning the **data analysis methods** used to evaluate online sustainability communication, seven studies that conducted quantitative content analysis used binary/dichotomous scoring methods with a score of 1 for the presence of each indicator and a score of 0 for the absence of each indicator, giving main reasons of simplification and elimination of the prevalence of subjectivities in scale ratings. Only two of these studies (Jain & Winner, 2016; Santos et al., 2016) used ordinal scales for only one indicator, which is the number of pages of sustainability communication on

corporate websites, in addition to using binary/dichotomous scoring methods for all of the other indicators. Meanwhile, two studies (Hossain et al., 2019; Zutshi & Creed, 2018) used qualitative analysis to evaluate online sustainability communications. In contrast, Kong et al. (2020) used 7-point Likert-type scales and 7-point semantic differential scales for consumers to rate their attitudinal and behavioral responses toward the online sustainability communications messages that they are exposed to in the experiments.

Regarding the **types of online media** examined, nine studies analyzed corporate websites, most of which included sustainability reports found on the corporate websites. Two of these nine studies (Dodds et al., 2020; Viciunaite, 2020) analyzed sustainability communications on social media in addition to websites. Two studies did not examine the content on corporate websites. Specifically, Hossain et al. (2019) examined sustainability reports, while Kong et al. (2020) examined consumers' responses toward fictitious Instagram messages (with real brand names) that communicate different areas of sustainability benefits. Further studies could examine online sustainability communications in additional social media channels.

This paper analyzes that the concepts, theories, guidelines, dimensions, and indicators used in each framework/model for evaluating sustainability communications reflect the researchers' perspectives on the **role of corporate communication** as a strategic aspect of business actions in a sustainable economic strategy. Specifically, Tesařová et al. (2020) stated that communication about sustainability performance, especially through the use of digital media, has become an "inherent part of the overall communication throughout companies…" (p. 2119). In addition, the sub-dimensions in the "content" dimension of Siano et al. (2016) placed emphasis on clear and specific communication of sustainability activities that are traceable, verifiable, and meet stakeholders' needs. Jain and Winner (2016) highlighted the importance of the placement of sustainability communications on easily accessible areas of the website, including homepages and company profile pages, and disclosing sustainability information to meet stakeholders' expectations about organizational commitment to environmental, social, and economic sustainability. Esterhuyse (2019) emphasized corporate transparency in the implementations and communications of sustainability to financial stakeholders and non-financial stakeholders. Viciunaite (2020) viewed sustainability communications as the translation (i.e., knowledge transfer across contexts through communication) of sustainable business models, including communications of core corporate sustainability values and conveying meaningful values of sustainability to consumers. Dodds et al. (2020) identified the importance of efficiency, consistency, and sufficiency of sustainability communication in enhancing sustainable brand image and perceived value among stakeholders. Furthermore, the presence of many indicators for evaluating interactive features for stakeholder

engagement in the proposed frameworks of An et al. (2020) and Siano et al. (2016) also indicate the essence of the strategic role of corporate sustainability communications since organizations have to be regular ready to engage in dialogues. Hence, it can be concluded that scholars viewed the role of sustainability communications as essential for the disclosure of all processes of sustainable implementations in ways that are easily accessible to stakeholders to meet their expectations. Consequently, this paper conceptualizes the **role of sustainability communication** as the blood vessel that nourishes all processes of strategic actions of corporate sustainability in a sustainable economic strategy.

Online corporate sustainability communications evaluation frameworks: their contributions and limitations

As previously mentioned, three studies proposed new conceptual frameworks and operational models for evaluating online sustainability communication. This section provides a summary of the dimensions and indicators of each framework and an analysis of their contributions and limitations.

Siano et al. (2016) proposed the OSEC framework, an operational model for evaluating sustainability communication on corporate websites, comprising four main dimensions: (1) **orientation**, (2) **structure**, (3) **ergonomics**, and (4) **content**, along with a separate dimension "**the greenwash penalties**" that deducts points from the total score. Each **dimension** contains ***sub-dimensions***, which are measured by multiple indicators called *items*. The OSEC model consists of 18 sub-dimensions and 64 items. The first dimension, **orientation (O)** refers to the presence of Triple Bottom Line elements in the ***mission*** and ***vision*** statements of the company. Second, **structure (S)** refers to information provided on the corporate website, specifically these four sub-dimensions: (1) "***stakeholder engagement section***," (2) "***stakeholder engagement tools***," (3) "***the governance of sustainability: organizational model***," and (4) "***the governance of sustainability: tools/resources of corporate identity***." Third, **ergonomics (E)** measures the interactive features and user-friendliness of the website with five sub-dimensions: (1) ***accessibility***, (2) ***navigability***, (3) ***usability***, (4) ***interactivity***, and (5) ***multimedia***. Fourth, the **content (C)** dimension aims to evaluate the information and message design regarding corporate sustainability with 7 sub-dimensions. The first sub-dimension, "initiatives of corporate sustainability" consists of three items based on three criteria for assessing the sustainability impact of Porter and Kramer as cited by the authors, which are **content** related to the *core business*, *value chain*, and *general social interest*. The other six dimensions of **content** are based on principles of communication, namely "***visibility***," "***clarity***," "***authenticity***," "***accuracy***," "***consistency***," and "***completeness***." Finally, for "**the greenwash penalties**," the authors identified five types of signals and specific dimensions and sub-dimensions of the OSEC model in that these signals tend to occur. "**The greenwash penalties**" comprise four

of the seven "Sins of Greenwashing" from the Greenwashing Report of TerraChoice Environmental Marketing (UL, 2021), namely "Sin of No Proof" (**orientation** and ***authenticity***), "Sin of Irrelevance" (**orientation**, ***core business***, and ***value chain***), "Sin of Vagueness" (**orientation** and ***accuracy***), and Sin of Worshipping False Labels" (***verifiability***, ***authenticity***, and ***clarity***), and the authors added "unidirectional approach to stakeholder," which refers to the lack of "***stakeholder engagement tools***" and can be checked in both the **orientation** dimension and the "***stakeholder engagement tools"*** sub-dimension.

The OSEC model of Siano et al. (2016) utilizes a quantitative scoring method that treats each of the 64 *items* as dichotomous (dummy) variables by giving a score of 1 for the presence of each *item* and a score of 0 for the lack of each *item* on the corporate website. By using the equipartition criterion, the total score of each corporate website range from 0 to 100, in which the authors consider sustainability communications of corporate websites that score over 60 as acceptable, over 70 as satisfactory, and over 80 as excellent. Moreover, greenwash penalties result in deductions of points from the total score. The authors analyzed that audiences should be skeptical of the truthfulness of any sustainability communications from companies that display signals of greenwashing.

Regarding the scope of selected companies, Siano et al. (2016) explored a global scale. The authors initially analyzed the first 100 websites of organizations from the "Global CSR RepTrack 2015" by the Reputation Institute in order to operationalize the dimensions, sub-dimensions, and indicators (*items*) of the OSEC framework. Ultimately, the authors tested the OSEC model by conducting a pilot study of 37 leading companies in the energy and utility industries from the Dow Jones Sustainability World Index (DJSWI).

Therefore, it can be concluded that the main contributions of the OSEC model proposed by Siano et al. (2016) are the specific criteria for evaluating not only information about sustainability but also the quality of corporate websites, especially the website layout and stakeholder engagement features. A novel contribution of this framework is "the greenwash penalty" which imposes additional deductions to the final score in addition to determining the presence or absence of each indicator of sustainability communication. Concurrently, a limitation is that it might not be clear to some audiences how the dichotomous scores of the 64 items are converted into a total of 100 points. Thus, the authors could specify a formula as well as illustrate an example of the calculation for at least one of the 37 companies included in the pilot test.

An et al. (2020) developed an assessment framework based on GRI sustainability reporting guidelines (G4) and previous studies, including stakeholder theory and legitimacy theory, to examine online sustainability reporting on the official websites of universities in Hong Kong. The framework is structured into three parts: (1) general aspects, (2) specific aspects, and (3) stakeholder participation. First of all, the **"general aspects of sustainability reporting"** indicate the presence

or absence of five ***aspects*** of sustainability communication on the universities' website: (1) "***Web map indicating sustainability-related information***," (2) "***specific section for sustainability reporting***," (3) "***information regarding a specific sustainability office/committee***," (4) "***statement of vision and strategy for sustainability***," and (5) "***regular stand-alone sustainability report***." Next, **"specific online sustainability disclosures"** consist of eight dimensions that contain sub-dimensions (referred to as ***aspects***). The first three dimensions, namely ***economic***, ***environmental***, and ***social***, resemble the **triple bottom line**, followed by the aspects of ***human rights*** and ***society***. The last three dimensions are directly related to education: ***teaching***, ***research***, and ***service***. Finally, "**stakeholder participation**" comprises five aspects: (1) "***identification of stakeholders***," (2) "***particular emails for the contact of sustainability issues***," (3) "***forums for communication of sustainability issues***," (4) "***Web 2.0 technology particularly for sustainability information***," and (5) "***online surveys particularly for sustainability***."

Similar to Siano et al. (2016), the framework of An et al. (2020) used a binary, dichotomous scoring system by giving a score of 1 for the presence of each *aspect* and a score of 0 for the lack of each *aspect* on the universities' website. Moreover, An et al. (2020) also conducted interviews with stakeholders in the higher education sector, specifically the management team of the university, employees who work for the sustainability office, academic researchers, and students, in order to gain supplementary information that supports or contradict the sustainability communication on the universities' website.

Using this framework, all of the eight public universities in Hong Kong were chosen to conduct multiple local case studies because they signed the Hong Kong Declaration and established the Hong Kong Sustainability Campus Consortium (An et al., 2020). This indicates that these universities aim to be strategically involved in sustainability initiatives on campus and in the community. Hence, evaluations of sustainability communication of these universities could provide useful insights, and future studies could utilize this framework to examine private universities and compare the findings.

To sum up, the main contribution of the assessment framework of An et al. (2020) is the specific criteria for evaluating corporate sustainability communication, corporate website structure, and interactive features for stakeholders. Another beneficial contribution is that while some aspects, such as teaching and research, are specific to the education sector, the majority of aspects of this framework could be applied to evaluate sustainability communications on corporate websites in other industries. Meanwhile, a limitation is that the operational definitions of the "number of initiatives" and "number of indicators" for the "specific aspects" were not explicitly stated, which could be ambiguous for some audiences.

Esterhuyse (2019) proposed a framework to operationalize **corporate transparency** by examining corporate communication management (CCM) regarding the disclosure of sustainability information on corporate websites among messages that target two main groups of stakeholders, financial stakeholders, and non-financial stakeholders, among companies with different levels of perceived quality of sustainability communications. The author conceptualized that companies tend to employ different message designs with different underlying motives when communicating about sustainability to these two groups of audiences. CCM that target **non-financial stakeholders** (such as communities, employees, and environmental groups) tend to be managed by the public relations (PR) department and engage in **sustainability reporting** on corporate websites with **message designs** that emphasize the effects of corporate sustainability initiatives on enhancing the quality of life, employment, and environmental issues, and can be explained by the **legitimacy theory**, which indicates the intentions of meeting expectations of the community and gaining social approval. Concurrently, CCM that target **financial stakeholders** (including investors, banks, and creditors) tend to be managed by the investor relations (IR) department that create **corporate IR webpages** to communicate **messages** regarding financial disclosures, social strategy disclosures, and environmental strategy disclosures with the intentions of conveying financial value and trustworthiness in these **voluntary disclosures**. **"Perceived quality of communications"** was determined based on whether the company was included in the Socially Responsible Investment (SRI) Index of the Johannesburg Stock Exchange (JSE) in South Africa. Furthermore, **"IR best practices"** were evaluated by conducting content analysis of corporate IR webpages and used to indicate transparency.

Esterhuyse (2019) examined a total of 196 companies from the JSE from six industries, specifically basic materials, consumer goods, consumer services, financials, industrials, and technology. 69 of these companies were listed on JSE's SRI Index, while 127 companies were not listed on the SRI. Dichotomous scoring was given for indicators of the independent variable **"perceived quality of communications"** and the dependent variable **"IR best practices,"** resembling the quantitative scoring methods used by Siano et al. (2016) and An et al. (2020). The IR disclosure score out of 244 points is then calculated as a percentage (Esterhuyse, 2019).

To conclude, the main contribution of the framework of Esterhuyse (2019) is the new perspective of investor relations practices in the communication of corporate sustainability information by integrating both the legitimacy theory and the voluntary disclosure theory into the same framework. Simultaneously, a limitation is that the author did not include information on the specific dimensions and indicators used for the content analysis of "**IR best practices**." The author stated that the dichotomous indicators used to measure "**IR best practices**" are based on

the guidelines of Loranger and Nielsen (2009) and the Investor Relations Society (2011) cited in the paper, but the specific dimensions and indicators from these sources were not elaborated in this article. It is beneficial to include this information when proposing models so that future researchers who are not familiar with the cited sources could replicate the content analysis with different samples of companies.

Thematic analysis of frameworks and suggestions for further studies

It can be concluded that six themes emerged from reviewing and synthesizing these 11 empirical studies regarding online sustainability communication evaluation frameworks.

First, based on the overall perspective from these studies that online sustainability communications are essential not only for disclosure of information but also for enabling discourse through stakeholder engagement, this paper conceptualizes the role of corporate sustainability communication as the blood vessel that facilitates all strategic processes of corporate sustainability initiatives and implementations by enabling the flow and exchange of information among various internal and external stakeholders.

Second, most frameworks were operationalized by conducting the content analysis of sustainability communications that are publicly available on corporate websites, specifically web pages or sections that contain sustainability communications, interactive features for stakeholder engagement, and files of sustainability reports. This reflects that corporate websites are one of the main online channels that have been examined in detail when analyzing the quality of sustainability communications. Hence, future studies could develop new frameworks for evaluating sustainability communications on social media, including not only corporate communications but also stakeholder engagement and sentiments and corporate responses to them.

Third, dichotomous measurements instead of scale measurements of indicators were used in most models for the main reasons of simplification and elimination of the prevalence of subjectivities in giving scale ratings. Further studies could try operationalizing scale ratings, such as Likert's scale or semantic differential scales, of indicators in the frameworks by creating rubrics for each point in the scale to enable more detailed evaluations of the quality of communications.

Fourth, while many distinctive communication-related theories and conceptual frameworks have been used to develop each model along with components regarding website structure and dialogic stakeholder engagement features, the triple bottom line (TBL) is still widely used as an important component for evaluating sustainability communications in many parts of recent models. This leads to the managerial implication that sustainability practitioners should explicitly implement and communicate social, environmental, and economic benefits.

Fifth, leading companies tend to be selected to empirically test the models. This indicates that future research could attempt to evaluate online sustainability communications of local brands in niche markets that have not been listed on well-recognized sustainability indices.

Finally, while the majority of frameworks were used for industry-specific contexts in specific countries, many dimensions and indicators of each framework could be applied to evaluate organizations in other industries and countries that were not examined by the empirical studies included in this review.

Conclusion

In conclusion, the present paper contributes to the body of knowledge on online sustainability communications by reviewing existing frameworks and theories that have recently been used to evaluate online communications of corporate sustainability within the past five years from 2016 to 2020. The purpose of this review is to analyze whether communication has been included as one of the main strategic areas of corporate sustainability. After analyzing the frameworks in relevant studies, this paper conceptualizes the role of sustainability communication as the blood vessel that flows through all processes of strategic actions of corporate sustainability in a sustainable economic strategy to enable the exchange of sustainability discourse among stakeholders. This review of online sustainability communications evaluation frameworks could provide directions for scholars and practitioners. Future research endeavors could apply the models for evaluating online sustainability communications in unexplored industries and countries or use these models as references for developing and proposing new frameworks. Sustainability practitioners could acknowledge the characteristics of online sustainability communications evaluation frameworks presented in this review in order to determine aspects that influence stakeholders' evaluations of sustainability communications and develop communications strategies for various online media channels accordingly.

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Technology-Based Social Sustainability Transformation

Assessing youth engagement to agricultural activities at Central Luzon Philippines: Basis for the development of infomediary material

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Abstract

This research sought to analyze the youth engagement in agricultural activities at Central Luzon Philippines and its implications to food security with an end view on the development of Infomediary Material to the proposed Magna Carta for Young Farmers. Using the descriptive method of research via a self-made questionnaire employed among the 213 youth respondents from Central Luzon and 10 licensed agriculturists from the Department of Agriculture-Central Office. Frequency Distribution, Percentage Distribution, Weighted Mean, and t-Test were the statistical tools utilized in the study. Further, the researcher used content analysis for the examination of the data based on the interview answers. Results revealed that the majority of the respondents were aged 15 to 20. Most of the potential farmers in Central Luzon were male than female. They were interested to engage in farming and were hindered by their parents to enter into agriculture. The data also showed that three (access to financial services, access to land and engagement to policy dialogues) out four variables were interpreted to be "disagreed" except for access to agricultural-related training. The implications to food security in the deceasing of youth engagement in agriculture showed the following assessment: *availability* -- local food supply will not be sufficient to feed population; thus, people will be an import-dependent country which is normally done to cater between supply and demand for food, *accessibility* -- as the supply decreases, the demand will increase therefore food prices will also be affected and *utilization* -- less supply the higher the price, higher commodity the price less people could afford to have a buying power to more nutritious food. Based on the findings and conclusions, an Infomediary Material is made as a tool that can be used by legislators to prioritize the urgency of ratifying the Magna Carta for Young Farmers.

Keywords: agriculture, food security, Magna Carta of young farmers, young farmers

Introduction

As of 2018, the average age of Filipino farmer is 57 years old and the youth are no longer attracted to agriculture. The food security of the country will be at risk as millions of farmers and fishers are aging and their children are not interested in taking over.

According to the Bureau of Agricultural Statistics (2016), despite being an agricultural country, the data showed that only about 12 million Filipino farmers in a total population of 100 million and despite the increasing population, the existing number of farm workers has been declining over the past years; since 2007 which accounted a rate decline of 1.5% per year. In 2008, Filipinos engaged in the agriculture sector accounted for 35% of the country's total labor force while in 2010, this went down to 33% only. In the year 2016, the sector in agriculture lost the greatest number of workers (624,000) out of the total employment, from 12.47 million in 2015 to 11.84 million in 2016 losing more than half-million farmers in just a year. Notably, farm owners in Central Luzon are reportedly having problems finding farm laborers during the period of production and harvest season. The agricultural liberalization has also caused traditional crops and livestock products to be marginalized by foreign imports.

The Filipino young farmers, who form an integral part of the agriculture sector, are fast becoming a vanishing breed. The prevailing notion of an ordinary youth is not enticed to enter the agriculture sector– their grandfathers remain poor and their families were poor and they will remain poor. The younger generation or "millennials" who are witnessed by their aging parents and remain poor do not appreciate farming as a lucrative way of profession. They are also the direct observer to high costs of agricultural inputs but low prices of produce.

The young people, however, can still be enticed to enter agriculture once they realize its value, the opportunities it has to offer, and the sense of pride inherent in this sector. The House Bill No.1997 or otherwise known as Magna Carta for Young Farmers is an inclusive human rights law to uphold the economic and social well-being of young farmers, improve their capabilities and skills and remove discrimination against them by protecting, recognizing, and promoting their rights, especially the underprivileged and marginalized.

Moreover, the Magna Carta for Young Farmers should provide awareness of the aspirations and situation of young Filipino farmers, address their challenges, enhance their roles, and harmonize existing and proposed policies that affect the dilemma of young farmers.

In view of this bill, it was initially filed as House Bill No. 5657 by Representative Christopher De Vencia of the Fourth District of Pangasinan during the 17th Congress. This version was pending by the Committee on Agriculture and Food and no action since then. The principal author of this bill re-filed it on the 18th Congress as House Bill No. 1997.

Moreover, the bill was submitted to the National Economic and Development Authority (NEDA) to validate for immediate passage. The National Economic Development Authority (NEDA) is mandated for macroeconomic forecasting and policy analysis and research development. Based on the Philippine Development Plan (PDP) 2017-2022, the Magna Carta of Young Farmers is one of the priority legislations for the remaining years of the current administration to boost economic growth.

Hence, the researcher was prompted to conduct this research since the researcher is an employee of the Department of Agriculture-Central Office. The study attempted to assess the engagement of youth in agricultural activities and its implications to food security. The findings of the study will be a basis to develop an Infomediary Material that can be used as a tool for the legislators to prioritize the urgency in the ratification of the Magna Carta for Young Farmers.

Statement of the problem

The study aimed to assess the engagement of youth in agriculture and its implications to the Philippine food security.

Specifically, it sought the following statements:

1. What is the socio-demographic profile of the youth respondents in terms of the following variables:

    1.1 Age;

    1.2 Sex;

    1.3 Educational Status;

    1.4 Personal Interest;

    1.5 Interest in Farming;

    1.6 Farming Experience; and

    1.7 Parental Advice

2. How can the youth engagement in agricultural activities be assessed in terms of the following:

    2.1 Access to Financial Services;

    2.2 Access to Land;

    2.3 Access to Agricultural Related Trainings; and

    2.4 Engagement to Policy Dialogues

3. What are the implications to food security on the decreasing number of young farmers in terms of the following:

3.1 Availability;

3.2 Access; and

3.3 Utilization

4. Based on the assessment, what infomediary material can the researcher develop for the proposed Magna Carta for Young Farmers?

Hypothesis:

There is a significant difference in the assessment of the youth engagement in agricultural activities when grouped according to their cooperatives.

Scope and limitations of the study

The study focused only on assessing the engagement of youth in agricultural activities and its implications to the Philippine food security. Further, the results of processing the data gathered will serve as a basis for the development of an Infomediary Material for the proposed Magna Carta of Young Farmers.

In addition, it tried to assess the engagement of youth to agricultural activities in terms of access to financial services, land, agricultural-related training, and engagement in policy dialogues. Moreover, it also attempted to determine the implications on the decrease of engagement of youth in agriculture to the Philippine food security. It covered the components of food security; availability, access, and utilization.

The study used a descriptive method of research and a self-made questionnaire. The researcher selected five (5) rice farming cooperatives from Central Luzon through the assistance of the Department of Agriculture-Regional Field Office III. The youth respondents were limited only to the son and daughter of the rice farmers aged 15-35. Further, the proposed Magna Carta of Young Farmers is not limited to Central Luzon but applies to the youth sector in the country aged 15-35 although the study focused on Central Luzon.

Review of literature and studies

According to Asian Farmers Association for Sustainable Rural Development (2017), notwithstanding being an agricultural country, there are only 12 million farmers in the Philippines in a total population of about 97 million based on the 2012 data. Filipino farmers are small landholders farming an average of 2.5 ha of land each. In 2008, the 12.03 million Filipinos (75%

men) employed in the agriculture sector accounted for 35% of the country's labor force; in 2010, this went down to 11.96 million (or 33%). The number of children aged 5 to 17 years old working in farms nationwide fell to 1.26 million in 2010.

Several studies attempted to determine the factors contributing to the decline of youth in engagement in agriculture which is an alarming phenomenon.

The attitudinal factor of students toward extrinsic elements in tertiary courses is assumed to be the factor affecting the decreasing trend. The quality of education and facilities/laboratories of agriculture offerings are believed to drive away potential students. In 2014, a study entitled Predisposition Factors of Students' Choice in Agriculture, Fisheries and Natural Resources Course (Luzon Area) posited that extrinsic factors like obsolete or not upgraded facilities and the limited number of instructional or laboratory facilities in universities offering agriculture courses have a significant effect on students' choice of tertiary course.

The same study discovered that only 20% of the respondents preferred an agriculture-related course. The respondents are mostly from rural areas of Luzon.

The study of Philippine Institute for Development Studied (2013) suggests a comprehensive explanation for this issue. The poor quality of education can be outlined as underinvestment both in human resources and facilities. The politically motivated proliferation of state universities and colleges may not be always for the advantage of the students, especially those from the lower economic bracket.

Family factor are another set of influences that can shape the interest or disinterest of the youth in agriculture. Youth growing up in poor farming families will likely look for a substitute for agriculture.

The issue is not just about the declining interest in agriculture. Lasco (2007) observed that half of BSA graduates from UPLB from 2000 to 2005 were employed in non-agricultural-related jobs (Tuquero and Quimbo, 2008).

Although most agriculture graduates were shown to have been employed after finishing tertiary courses, there is still a high desire to get another job, with hopes of getting better pay, permanent positions related to agriculture (De Vera, 2011 as cited in PIDS, 2011 p. 3).

Moreover, the economic landscape changes affect the enrollment of agriculture trends. Decrease trend to be focused among traditional production-oriented courses, such as forestry and agriculture. According to Commission on Higher Education (CHED), Filipino students prefer popular courses such as Industrial Technology, Engineering, Hotel and Restaurant Management and Education.

According to the Food and Agriculture Organization of the United Nations (2014), youth and agriculture key challenges were divided into four major issues: (1) Access to Financial Services; (2) Access to Land; (3) Access to Agricultural Related Trainings; and (4) Engagement to Policy Dialogues.

Talking these four principal challenges will be vital to increasing youth's involvement in the sector of agriculture, and eventually addressing the important untapped potential of this sizeable and growing demographic. In developing countries, the youth facilitation cohort's participation in agriculture has the potential to drive widespread rural poverty decrease among youths. While these challenges are compound, several key conclusions and recommendations can be drawn from the case studies: ensuring that youth have access to the right information and data is crucial; integrated training and capacity building development approaches are required so that youth may respond to the needs of a more modern agricultural sector; modern and advanced information and communications technologies offer potential; there is a distinct need to organize and bring youth collected to improve their abilities for collective action; youth-specific projects and programs can be efficient in providing youth with the extra push needed to enter the agricultural sector; and integrated answer is needed from policymakers, legislators and development practitioners alike to ensure that the central challenges faced by youth are effectively lectured. Indeed, coordinated response to increasing youth's involvement in the agricultural sector is more important than ever, as a rising global population and decreasing agricultural productivity gains mean that youth must play a pivotal role in ensuring a food-secure future for themselves, and future generations.

Access to financial services

According to House Bill 1997 or otherwise known as "Magna Carta of Young Farmers" under Section 9 Access to Technology, Credit and Capital Paragraph C, it is stated that the State shall ensure that young farmers have equal access to formal sources of credit and capital including forms of clean loans and Mortgage, Redemption, and Insurance (MRI).

Access to financial services such as loans and savings is fundamental to start any agricultural and farming activity. Even if youth do have access to land, they still need finance to cover the costs of planting, harvesting and marketing, as well as investments in improved production capacities. Trading services and payment, such as Internet trading and mobile banking, are important tools for selling their produce. Moreover, given that the agricultural sector is often exposed to adverse natural events that negatively affect production (Dalla Valle, 2012), access to insurance schemes is crucial for young farmers.

Access to land

The State shall guarantee young farmers a vital role in food production and food security by prioritizing their rights to land, technical training, and assistance, access to seeds and farm inputs, and assistance for product and market linkage and development (House Bill 1997 or the Magna Carta of Young Young Farmers, 2018).

The importance of access to land for the youth is not only one of the fundamental requirement to start farming, but it is also a source to generate employment, food security in household consumption, and sustainable income. The International Fund for Agricultural Development (IFAD) program described that access to land serves as collateral and security for credit accessing, youth' identity marking, and it will enable the participation in decision-making of community organs and other farmer's organizations.

Young people around the globe would realize access to land protection is an important factor for entering farming, however, they meet greater challenges and trials than adults. In addition, the young men are challenged in land access which is multiplied for young women. The Food and Agriculture Organization reported that young women only establish a small part of all farm tenants, holders, and those typical women which hold a small piece of land than men (Food and Agriculture Organization, 2011). Though the challenges and problems undertook by the youth sector are recognized poorly and it is probable to classify regular issues.

Access to agricultural related trainings

According to House Bill 1997 or otherwise known as the "Magna Carta of Young Farmers" under Section 8 Education and Training, it's stated that the State shall ensure to quality education and training of young farmers and encourage partnership and linkage with State Universities and Colleges (SUCs) on information and technology transfer to young farmer individuals and organizations.

It is documented widely that quality education and training is one of the major keys to advance the issues and challenges in rural areas. Not just only there is a direct linkage between food security and children of children in rural areas, however, it has also been revealed that numeracy skills and basic literacy help develop and improve farmers' livelihoods (FAO, 2007). Access to knowledge, training, and information of the youth are crucial in addressing the major challenges and problems they face in agriculture. For the youth to formulate agricultural laws and policies that affect them directly, in terms of access to market and finance as well as land, there is a need to receive appropriate information and education. Whereas this is true in developed and developing countries, it is often specified worry of the latter, where the youth sector may lack admission to even the most quality and formal education, and where educational institutions and schools are

developed less often. Formal education at the primary and secondary levels can be provided to young people with basic managerial, literacy, business skills and numeracy, and introduce youth to agriculture and its related fields. On the other hand, non-formal education (including extension services and vocational training) and tertiary agricultural-related education can offer youth more specific knowledge and information.

Engagement to policy dialogues

The State shall ensure the representation of young farmers in the policy-making and decision-making process initiated by private entities and government including but not limited to the National and Local Agrarian Reform Councils, National Organic Agricultural Board, National Youth Commission, and the National Anti-Poverty Commission to fully realize their roles as agents and partners for development (House Bill 1997 or the Magna Carta of Young Young Farmers, 2018).

Notably, youth contribution has a critical role in decision making and policy dialogue, and the policy-makers are asserted to work with the youth sector. For an instance, in 2020 the World Programme of Action for Youth and Beyond leads the agenda on the United Nations for Youth, recognized the efficient and effective contribution of youth in the society and policymaking as one of the ten priority parts (UNDESA, 2010). On August 12, 2010, the United Nations General Assembly announced the year initiation as the "International Year of Youth: Dialogue and Mutual Understanding", focusing on three important key result areas, including "engage and mobilize (increase the participation and partnerships in the youth sector)".

Though, to protect the dynamic participation of youth in decision-making and policy

Food security

In 2013, a research study conducted by the Philippine Institute for Development Studies (PIDS) discussed that the agriculture enrollment in related courses and fields quickly dropped in almost all regions in the country, with Region III suffering the highest decline from 1998 to 2008 where the Region III is tagged as the Philippine rice bowl capital.

According to House Bill 1997 or the "Magna Carta of Young Farmers under Section 11 Rights and Resources for Food Production, Paragraph 11.3, the Department of Agriculture (DA) including its attached agencies and corporations, in coordination with the Department of Agrarian Reform (DAR), Department of Environment of Natural Resources (DENR), Department of Trade and Industry (DTI), Department of Science and Technology (DOST), Department of Education (DepEd), National Commission on Indigenous Peoples (NCIP), National Youth Commission (NYC), Philippine Coconut Authority (PCA), Commission on Higher Education (CHED), National

Anti-Poverty Commission (NAPC) and all agricultural-related agencies attached under the Office of the President (OP) shall formulate and implement a National Young Farmers Plan within one hundred and twenty (120) days of the affectivity of this Act. The roadmap shall serve as the convergence program of government line agencies to ensure the maximum role of young farmers in food security.

Obviously, the government is under pressure to answer effectively to what is progressively in a crisis in food production and distribution. The food security issues are not only a local problem but a universal challenge as well, given the Philippines' significant requirement on rice importation. The governance of the Philippine economy is thus progressively focused on the disciplines of multilateral arrangements.

The effort of the Philippine government to push local agricultural productivity enhancement is controlled by governance instability, aggravated by insufficient financial and monetary resources for the serious public goods and services necessary for enhanced productivity. Therefore, there is a need for international funding and financing from institutions such as the Asian Development Bank (ADB). Commonly, the financing institutions need to establish agreed reform paths, with the budget release of contingent financing on the reform implementation.

The issue of food security has become an international concern. According to the Food and Agriculture Organization (FAO), the world's total population is expected to range from 9.3 billion by the year 2050. Improvement in food and agricultural production is a need to assure accessibility of safe and nutritious food. In Asia, it still has the top number of undernourished which accounted for 65% of the world's hunger data population (IRRI, 2010). In the continuous population growth, increasing the demand from changing nutrition, declining water and land resources for agriculture regarding the effects of climate change and unpredictable phenomenon, it has become a challenge to maintain and attain food security. Moreover, the Philippine food security situation is as important as in other countries.

The Autonomous Region in Muslim Mindanao (ARMM) has the top prevalence of food insecurity in the Philippines. In the face of continuous growth and development of the country which is assisted up by the globalization challenges, it is obvious that there is a firm need to understand the situation of food security as well as the factors to stand it. Understanding the causes and factors is important because it will help the legislators and policy makers to keep on the path of the main variables that affect sustaining food security and adequacy. Food insecurity and food security can be inspected at many levels nationwide, household, and individual level. In a broader perspective, a food secure country is when on a stable and continuous basis; the effective demand and food supply can shield the food necessity of its total population. Food requirement fulfillment either by means of local production, food access outside domestic production, or mixture of both

aspects (Aker and Lemtouni, 2000). This concludes that the food security level is determined by the communication and interaction of local and international forces. Relative to this, it is critical to have the data analysis at the national and regional level which covers the concrete food security situation taking into consideration the macroeconomic variables and factors perceived to stand food securities.

Method of research

This research study was designed to obtain information concerning the factors affecting youth engagement in agricultural activities and their implications to the Philippine food security. The data and information gathered were analyzed and interpreted to develop an Infomediary Material to be used for the proposed Magna Carta for Young Farmers.

Descriptive research was applied in this study since the data gathered were very useful to meet the existing problem. It helped the researcher to accomplish the desired purposes in the shortest time possible.

Sample Size, Population and Sampling Technique

The study employed a stratified sampling. This type was employed since the populations of the study were subdivided into several groups or cooperatives. The researcher selected five (5) rice farming cooperatives in Region III which the Department of Agriculture-Agribusiness and Marketing Assistance Service assisted in various market-related activities.

The total number of youth respondents aged 15-35 from the five (5) Rice Cooperatives in Region III based on the data given by the Agribusiness and Marketing Assistance Division of DA Region III was 456. Since the population is too large, the sample size was determined to gather accurate results with a confidence level of 95% (giving a margin of error of 5%). Since there were five (5) cooperatives, the researcher computed for the sample size by using Slovin's Formula of each group by getting the ratio of the population of each group and the total population multiplied by the computed sample size, 213.

$$n = \frac{N}{1 + Ne^2}$$

Where:

n – sample size

N – population size

e – margin of error

n= 456 / 1+ 456 (.0025)

n = 213

For the Hardinero Agricultural Cooperative from Pampanga, (109/456) *213=50, for Sta. Ana Multi-Purpose Cooperative from Pampanga, (72/456) *213=33, for Pulian Rice and Vegetable Producer Cooperative from Bulacan, (88/456) *213=41, for Crusada Farmers Livelihood and Development Association from Bulacan, (124/456)*213=57 and for the Bagong Buhay Mabani MPC, (63/456)*213=29

Table 1 Number of respondents from different rice farming cooperatives in region III

Rice Farming Cooperative	Province	Population	Sample Size
Hardinero Agricultural Cooperative	Pampanga	109	50
Sta. Ana Multi-Purpose Cooperative	Pampanga	72	33
Pulilan Rice and Vegetable Producer Cooperative	Bulacan	88	41
Crusada Farmers Livelihood and Development Association	Bulacan	124	57
Bagong Buhay ng Mabani MPC	Nueva Ecija	63	29
Total		**456**	**213**

Table 2 Number of respondents from department of agriculture

Department of Agriculture	Number of Respondents
Agribusiness and Marketing Assistance Service (AMAS)	5
Field Operation Service (FOS)	5
Total	**10**

Further, Table 2 refers to the respondents that identified the implications on the decrease of youth engagement in agriculture to Philippine food security through an interview, the researcher used ten (10) licensed agriculturists from the Department of Agriculture.

Description of respondents

The respondents shall be 15-35 years old to be classified as Filipino youth in the study. According to the Magna Carta for Young Farmers (2018), Youth Farmer refers to an individual whose primary source of income comes from agriculture, with an age range of 15-35 years old, is owner, worker, tenant, or lessee of the land in which he personally cultivates and tills. The profile of the respondent was described in terms of age, sex, educational background, and marital status.

Research instrument

The tool used in gathering the data is a self-made questionnaire. The questionnaires were divided into two parts. The first part focused on the youth engagement in agricultural activities in terms of access to financial services, access to land, access to agricultural-related training, and engagement in policy dialogues.

Table 3 Questionnaire part I Chronback alpha results reliability statistics

Cronbach's Alpha	N of Items
.960 (Excellent)	17

Legend: Chronbach's Alpha Internal Consistency

$a \geq 0.9$	Excellent
$0.9 > a \geq 0.8$	Good
$0.8 > a \geq 0.7$	Acceptable
$0.7 > a \geq 0.6$	Questionable
$0.6 > a \geq 0.5$	Poor
$0.5 > a$	Unacceptable

Table 3 presents that the Chronback Alpha result of research instrument part I is excellent or acceptable to use for the study.

The second part, an interview questionnaire that identified the implications on the decrease of youth engagement in agriculture to the Philippine food security in terms of food availability, food access, and utilization.

After getting the result, the researcher developed an Infomediary Material which refers to a material that covers the literature and studies of the problems and challenges of young farmers in the Philippines.

Data gathering procedure

The researcher sought first approval from the Department of Agriculture – Regional Field Office III to conduct his study as the preliminary step. This was done after the research instrument was considered valid and reliable through the Chronback Alpha results.

After the permit and the needed data were gathered, copies of the first part validated instrument were distributed and discussed to the children of rice farmers aged 15-35 together with their parents. Each set of questionnaires were accompanied by a cover letter stating the purpose of the study, the importance of the respondent's participant, the assurance of the confidentiality of responses and were personally distributed and administered by the researcher to the respondents and were coupled with detailed instruction of the content to avoid misinterpretation. After a thorough explanation, the researcher requested the group of respondents to answer the questionnaire honestly and sincerely.

Moreover, the copies of the second part validated instrument were discussed and distributed through an interview to the licensed Agriculturists in the Department of Agriculture – Central Office.

In addition, the interview conducted was taped and recorded for analysis. The researcher sought to use content analysis for the analysis of the data. The result of determining the factors affecting youth engagement in agriculture and their implications to Philippine food security were used as a basis for the researcher to propose an Infomediary Material entitled "Batang Magsasaka: Strengthening the Role of Youth towards a Food Secured Philippines".

Results and discussions

Table 4 Assessment of the respondents' engagement in agriculture

Indicators	Weighted Mean	Verbal Interpretation	Ranking
Access to Financial Services	2.25	Disagree	3
Access to Land	2.36	Disagree	2
Access to Agricultural Related Trainings	2.67	Agree	1
Engagement to Policy Dialogues	2.17	Disagree	4
Overall Weighted Mean:	**2.36**	**Disagree**	**-**

Legend: *3.51-4.0= Strongly Agree, 2.51-3.50=Agree, 1.51-2.50= Disagree, 1.0-1.50= Strongly Disagree*

On the overall assessment of the youth engagement in agriculture, based on tabulation, the indicator "Access to Agricultural Related Trainings" obtained the highest weighted mean of 2.67 with a qualitative meaning of "Agree". Followed by the "Access to Land" with a 2.36 weighted mean and "Access to Financial Services" with 2.25, both with the qualitative meaning of "Disagree". Whereas, "Engagement to Policy Dialogues" got the lowest weighted mean of 2.17 with a qualitative meaning of "Disagree".

As shown in the table, the indicator "Access to Agricultural Related Trainings" got the highest weighted mean. Thus, it revealed that some of the respondents already attended the Department of Agriculture-Agricultural Training Institute (ATI) seminars and training provided by their respective schools and institutions. Further, computer-based agricultural modules and related materials are available to the Department of Agriculture-Agricultural Training Institute (ATI) website where the respondents have access. The indicator "Engagement to Policy Dialogues" got the lowest, where most of the respondents are not aware of the pending bills in the Philippine Congress that are related to the protection of young farmers.

As to the "Access to Agricultural Related Trainings", the Department of Agriculture-Agricultural Training Institute (DA-ATI) believes that more young farmers are on their way towards shaping the agricultural sector as a more innovative and business-centric industry after learning different local and international farming practices.

Through its Regional Training Centers (RTCs) nationwide, Agricultural Training Institute (ATI) is offering this scholarship program for deserving and capable young individuals, particularly the smallholder farmers and fisher's children, in pursuing studies and career professions in agriculture and agribusiness. This is in partnership with the Department of Interior and Local Government (DILG) and different State Universities and Colleges (SUCs) in the country.

The program will offer to fund for tertiary education of youth scholars for the completion of their chosen four- or five-year degree course in agriculture, fisheries, and other related fields. It intends to produce agricultural professionals and a new breed of farmers equipped with the appropriate knowledge, skills, and attitude in putting up agribusiness projects.

The "Access to Land", got the second-highest weighted mean with "Disagree" interpretation. The primary problem of every youth farmer is that they cannot acquire and buy their own land. This issue is one of the explanations why many young people are disheartened to enter agriculture.

In rural areas, one of the drivers of poverty has been the lack of land ownership. Preceding the beginning of policies and land reforms in the Philippines, it is accounted that almost 50% of the population in rural areas were landless.

It has been a connected issue that the agriculture sector is facing an immense conversion of agricultural lands to non-agricultural. This is a result of lower food productivity output due to less arable lands. The government shall focus to mitigate these problems and challenges, as landowners and farmers should be the first people who will fight not to sell their lands for commercial and industrial purposes. The farmers should be empowered to continue their farming and production rather than to sell their lands.

Understanding the sector of agriculture is more than just farming and fishing can benefit people give more importance to this career. It is essential to transform the mentality of the youth and make farming sexy.

To discourage land conversion, the total gains from the farm must surpass the supposed potentials gains from conversion. Moreover, by increasing the overall wage of the farmer laborers or by increasing farm productivity where farmer yields and process at minimizing cost outputs.

Incentives will be able to entice young people to do farming. A prolific farm will produce better income which may attract the youth. The additional hindrance that must be broken, aside from income disparity is the discrimination and stigma. Most would say that farm life is connected with an unprofitable form of livelihood and poverty**.**

It can be seen from the assessment of the respondents overall the "Access to Financial Services" received a "Disagree" rating. Young people's attention in farming is however similarly to be absolutely connected to their skills to increase their access to the farm resources. Access to land, finances and viable markets, and other factors are restricting youth participation in agriculture. Access to monetary and financial services such as savings and loans are essential in starting activities in farming.

Strengthening and transforming the value chain analysis advancement processes as well as enticing youth access to finance for this value chain would improve their active participation in the agriculture sector. In addition, the provision of financial services and programs would permit the young people to improve their living and to gain assets in the future. Inclusive and appropriate financial services are essential as they could prepare youth with the support needed and resources to become economically and productive members of the agricultural communities.

While the "Engagement to Policy Dialogues" got the lowest ranking in the overall assessment. The young generation is often excepted from policy forums and dialogues due to their lack of bargaining power and skills. Several mechanisms and approaches have proven efficient for encouraging the participation of the youth in policy processes around the world. These include explaining stakeholders to the importance of youth participation; facilitating organization; and including the youth in the opportunities and challenges in agriculture for the African youth development process.

The first barrier is that youth may be apparent as having little capacity to shape their own intentions and in certain cases are not permissible to voice or speak out their concerns. For agricultural policies to be more favorable to youth, youth representation needs to match the variety of this group, as they may require diverse sets of interventions to simplify their engagement in a different segment of the value chain in agriculture.

3. Test of Significant Difference of the Respondent's Assessment of the Youth Engagement when they are Grouped According to their Cooperatives.

4. Content Analysis in the Implications on Food Security to the Decreasing Number of Young Farmers in the Philippines

4.1 Availability

The following data were taken from the content analysis of the respondents' perception of the implications in "Food Availability "of the decreasing number of farmers in the Philippines.

Generally, question number 3 "Due to the aging number of farmers in the Philippines, what do you think will be its impact on our food production?" and 4 "As we look forward to the future, do you think we will have enough quantity of food for consumption?" Tackle the "Food Availability" variable in the interview questionnaire.

Based on the theory employed in the study, one of the types of human insecurities is food security which causes hunger, famine, and sudden increase in food rates and prices. Due to the decreasing number of farmers in the Philippines, food security is at risk.

Food Availability denotes the quantity of available food that is existing in an area or country through all forms of local production, importation, food aid, and stocks. The word inclines to be practical to food available at a national and regional level rather than at the household level, which can turn into some misunderstanding as the word "availability" occasionally is used at the micro-level (Clay, 2002).

Based on the respondents, in the context of aging Filipino farmers, changes in the working age have a significant impact on agricultural output, without a new generation to take on the job, the food supply production begins to look uncertain. In addition, the older the farmers are, the smaller the opportunity to engage in agriculture but if the younger generation continues to engage in agriculture, food production and availability will be stable.

In the Philippines, which claims large areas of arable lands, establishing food security is a continuing issue, not only because of the many destructive typhoons and unprecedented phenomena but other variables as well and one of these is the aging of the farmers.

The respondents also noted that since there will be no "farming succession", food production will decrease. The local food supply will not be sufficient to feed the population; thus, the country will be import-dependent which is normally done to cater between supply and demand for food.

Moreover, the country will never achieve a sufficient quantity of food because the lands devoted to agriculture are now converted into subdivisions or for industrialization purposes based on the respondents. With the current mushrooming of the Philippine population, conversion of

available lands to industrialized infrastructures, and the decline of the number of farmers as well as the aging generation of farmers, there will be food insufficiency.

The continuous industrialization and urbanization of the areas near the National Capital Region (NCR) have resulted in the frequent decline in the productivity of agricultural land. It was conveyed about by the huge change of agricultural lands to industrial, commercial and residential purposes. In the province of Laguna, rice farms decreased from 2010 to 2015 by more than 50%. It was also associated with a corresponding decrease annually in rice production of about 21%. The statement is in a similar scenario that occurred in the province of Bulacan but on a smaller scale. Farmlands are converted to the above-mentioned purposes which are traditionally planted with crops like rice, sugarcane and coconut. In the last five years, 30% of total accounted land conversion were focused in the province Bulacan and Laguna. The study concluded intending to measure the impact of land-use conversion to agricultural and farm production with emphasis on rice (Masicat, 2015).

According to the respondents, the declining interest of Filipino youth in agriculture will affect its future sustainability. In the upcoming years, with the growing number of populations, the problem of agriculture will be much more challenging, particularly in satisfying the increasing food demand. Thus, the role of the Philippine government, in enticing to increase food production and availability becomes very complex and challenging. For that emerging reason, the willingness of the youth to become future farmers must be fostered.

4.2 Accessibility

According to Clay E. (2002), "Food Accessibility" refers to having access in "physical, economic, and social access". A lot of people only consider access to food within a financial or economic context, specifically after the 2005 Niger crisis on food and the volatility of food prices.

In general, question 5 "Is there a clear connection between higher food prices and the decreasing number of young farmers?" Tackle the "Food Access" variable based on the interview questionnaire.

The respondents viewed that there is a strong relationship between higher food prices and the decreasing number of farmers in the country. As mentioned in "Food Availability" analysis, the decreasing trend of youth engagement in agriculture will result in low production and food supply will be limited. As the supply decreases, the demand will increase, therefore, food prices will also be affected.

In addition, the respondents also noted that food price volatility challenges accessibility and affordability, and increases risks to food producers, retailers, and consumers. Price hike of a food commodity is normally favorable to the producer of that commodity. But, when food prices

increase, then return to usual levels – frequently in a random way – farmer-producers are usually unable to make well-timed planting and input choices to take advantage of such price increase.

Food price movements are also being more unstable rather than the general price level due to decreasing numbers of farmer population. Because of this instance, the marginalized households face greater problems and challenges in boosting nutritious diversity paralleled to higher-income households for numerous reasons, one of those is that vegetable and fruit retail prices have enhanced the fastest linked to other food items. Also, marginalized households normally do not have preservation access, thus cannot stock the supply of fresh and nutritious foods.

Further, the respondents also emphasized that failure to keep young people in farming could result in higher food prices to the consumer and the takeover of agriculture by big corporations that could monopolize the market. The government shall focus to influence the youth to enter into agriculture and provide them access and control over production resources (land, capital and market) and adequate skills and knowledge on production, processing, and agribusiness.

4.3 Utilization

Based on the interview questionnaire, question 6 "Do you think that the decreasing number of young farmers will result in hunger and malnutrition?" tackle the "Utilization" variable.

Food utilization through clean water, suitable diet, sanitation, and health care to reach a state of dietary and nutritional well-being where all physical and physiological needs are met. This takes out the situation of non-food inputs in the security of food (Clay, 2002).

According to the respondents' perception, there is a clear connection between decreasing number of farmers and the possibility of hunger and malnutrition. It is also associated with the law of supply and demand, less supply the higher the price, the higher commodity the price less people could afford to have a buying power to more nutritious food.

The areas that are the most affected by food insecurity and hunger are rural. This situation is particularly in conflict-affected parts of Central Mindanao and disaster-affected groups, mostly in the part of Visayas. These are also areas where poverty incidence is much higher than the national average.

Further, the increase in population and the decline in food production and agricultural activity in the past years equate to the persistent food insecurity and hunger in the country.

Moreover, hunger in the country is caused by various factors according to the respondents. One factor is inflation. The increase of retail food prices makes food commodity excessive and obstructs the ability of poor and marginalized households to meet their daily their dietary needs.

Laborers in the agriculture sector and its related fields are more likely connected with hunger due to low income (whether as farmers or farm workers), absence of access to productive properties

such as land and capital, and the susceptibility of the sector to several shocks such as infestation, climate change, and disease.

In addition, the respondents also highlighted that the nonappearance of effective land redistribution projects and programs spells fate for Filipinos relying on agriculture for a living and weakens their capability to feed the nation.

Conclusions

From the findings of the study, the following conclusions were drawn:

1. Socio-Demographic Profile of the Respondents

Potential rice farmers in Central Luzon are male than female. The youth are focusing on obtaining a high degree of educational attainment to find more lucrative jobs rather than engaging in agriculture and tilling the soil. Computer and cellular gaming are the interest of the youth that might affect their choices in life. Parental advice affects the interest and choices of their children to enter agriculture. Engaging in any agricultural activity was never perceived as a profitable form of livelihood.

2. *Assessment on Youth Engagement to Agricultural Activities*

On Financial Services, when the youth try to apply for credit and financial services of the government, the youth are guarded with the legal and regulatory environment, due to lack of specific tailored financial service and limited financial capacities. Incentives, financial grants and capital for encouraging rural youth agripreneurship are instruments of serious importance. Mentoring programs provide appropriate opportunities, as these prefer to see the government mentoring the youth to assist them to deal with fast trade markets. The Department of Agriculture – Agricultural Credit and Policy Council (DA-ACPC) was unsuccessful to disseminate the information to the youth on their programs such as Production Loan Easy Access (PLEA) and Farm Machinery Loan Easy Access (FMLEA).

On Access to Land, the majority of the children of rice farmers in Central Luzon have their own land to start farming. There are no intensified and sustained efforts in the execution of the Comprehensive Agrarian Reform Program. The openings for off-farm employment to the youth are not intensified.

Access to Agricultural Related Trainings, the Department of Agriculture-Agricultural Training Institute (ATI) seminars and trainings are provided to the youth in Central Luzon. Knowledge and information to agricultural commodity production and value-adding techniques and the relative technical know-how are of importance. Access to quality tertiary education related to agriculture is provided by the Department of Agriculture through scholarship grants.

Engagement to Policy Dialogues, according to the respondents, the Philippine Congress failed to conduct policy dialogues to the youth from Central Luzon that will explain the proposed Magna Carta of Young Farmers. The respondents emphasized that the legislative sector shall conduct policy dialogues and assessments that will collect all of their suggestions and recommendations. Equal engagement of the youth in the decision-making process at the local, regional and national levels is not facilitated by the legislature.

3. *Implications to Food Security*

Availability. The local food supply will not be sufficient to feed the population; thus, the country will be import-dependent which is normally done to cater between supply and demand for food. The country will never achieve a sufficient quantity of food because the lands devoted to agriculture are now converted into subdivisions or for industrialization purposes. The cumulative population will burden the agriculture sector predominantly in fulfilling the increasing food demand.

Accessibility. The decreasing trend of youth engagement in agriculture will result in low production and food supply will be limited. As the supply decreases, the demand will increase therefore food prices will also be affected. Unstable food prices destabilize accessibility and affordability and challenge the food producers and consumers. Failure to keep young people in farming could result in higher food prices to the consumer and the takeover of agriculture by big corporations that could monopolize the market.

Utilization. Utilization can be associated with the law of supply and demand, less supply the higher the price, the higher commodity the price less people could afford to have a buying power to more nutritious food. The increasing population and decline in food production greatly contribute to food insufficiency.

Recommendations

From the findings and conclusions, the following recommendations are advanced for the improvement of the study:

1. Socio-demographic profile of the respondents

1.1 Several policies and mechanisms to close the country's gender discrimination in agricultural works are vital to be institutionalized and enacted.

1.2 Parent engagement is a possible way to entice the youth to pursue professions and careers in agriculture. Information dissemination through government interventions such as seminars and symposia will help to impart knowledge on the value and importance of agriculture for the parents to engage their children in agriculture and farming.

1.3 To attract the youth in agriculture rather than indulging in computer games, the government may opt to develop and use of Information Communication Technologies (ICTs) in tackling the importance of agriculture. Adjusting can be difficult for some rural youth therefore it is vital to advance Information Communication Technologies (ICTs) platforms that are easy to use and simple.

2. Assessment on the youth engagement to agricultural activities

Financial Services

2.1 There is a necessity to create collateral-free systems that offer incentives anchored to the financial and monetary needs of young farmers. The Department of Agriculture-Agricultural Policy Credit Council (DA-ACPC) may consider to develop agriculture financial packages, loans and credit products that targeted the youth.

2.2 All government financial service programs are important to be available on government portals. These will create better consciousness among concerned youth to the type of programs they can possibly apply.

Access to Land

2.3 The Philippine government specifically the Department of Agrarian Reform (DAR) is mandated to secure and enhance land rights of the youth through the strengthening of information and access to laws and tools, the regulation of large-scale land investment to make sure that local land rights are appreciated and other business models. If this mandate will be amplified and institutionalized, it will enable to the young farmers to start and continue their agricultural activities and initiatives.

2.4 Moreover, land programs and projects for youth is salient to be directed with a systemic view and included in a broader strategy of rural development. A generational change approach is a part of a long-term strategy of transformation and competitiveness of the territory of a social fabric that forms the basis of rurality and producer organizations and civil society.

2.5 A program for land access is crucial to be deliberated by the national government for a complementary financial services and credit for productive assets (inputs, infrastructure, and assets) and capacity building. Land access is important to be tailored to rural youth. This means that financial services consider the features of the entrepreneurship productive cycle, consider grace periods until commercialization, low rates and flexibility in terms.

Access to Agricultural Related Trainings

2.6 Invest in training and education of the youth to enter agriculture is an utmosr priority. The Philippine Department of Education may include in their school curricula of the agricultural field and related subjects.

2.7 Appropriate trainings and capability buildings for the youth is essential to acquire skills in agriculture.

2.8 Modules in agriculture for primary and secondary levels, from production to marketing of agricultural commodities is essential. These could give attention to young people appreciating agriculture as a potential career and profession.

Engagement to Policy Dialogues

2.9 Enabling national policies on farming and food security are needed to address and identify the matters faced by young people. The youth is vital to be part of policy deliberations at the national and local levels.

2.10 It is therefore recommended that the youths' opinions are in utmost importance to be included when policy judgments are being in process and their suggestions is paramount in the policy-making process.

3. Implications to Food Security

3.1 In terms of the availability of land, young farmers must be protected access to land for them to farm to achieve sustainable food security. Appropriate education and agricultural advance technology will be more effective as long-term solutions.

3.2 To maintain food security at the household level, youth need jobs that produce income.

Though, they still need the necessary information and education.

4. Further research is also practical to gain appreciation of youth education levels related to Philippine food security.

5. Moreover, it is also recommended for future researchers to assess the aspect of food security and youth by emerging variables for monitoring and evaluation, both in the areas of youth participation in economic development and food security.

Research output: infomediary material

(https://drive.google.com/file/d/1uCPNFwhWil_7TQtkbh4rqOdoUXnsanzd/view?usp=sharing)

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Development of healthy food through organic farming based on bio-cyclo technology in Peri-Urban communities

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Abstract

The rapid development of peri-urban communities requires the transformation of healthy food development through organic farming and challenges to achievement for the SDGs. Increasing the urban population in Indonesia from 30.9% of Indonesia's population in 1990 to 49.8% in 2010 and is estimated to reach 70% in 2035. This is in line with the shift from rural to urban communities. As a result, the need for community readiness is strengthened to apply organic farming based on bio-cyclo technology in peri-urban areas. This study aims to analyze the transformation of conventional food agriculture to sustainable organic urban farming. The method used is Participatory Rural Communication Appraisal (PRCA) by placing researchers at the research location. Collecting data for decision-making and implementation of the community development by participatory technique through the involvement of local. The results showed that the self-social engineering approach, by placing the community as the subject, really effectively strengthened creative social energy, namely ideals, ideas, and friendships, in developing organic urban farming. In addition, there has been a transformation in the fulfillment of healthy food for the community and the realization of several aspects of the SDGs.

Keywords: bio-cyclo technology, healthy food, organic urban-farming, peri-urban society

Introduction

The development of infrastructure has an impact on the rapid development of peri-urban communities. The condition requires the transformation of healthy food development through

organic farming and challenges to achievement for the SDGs. Increasing the urban population in Indonesia from 55.4 million people (30.9%) of Indonesia's population in 1990 to 118.3 million people (49.8%) in 2010 and is estimated to reach 200 million people (70%) in 2035 (Mardiansjah et al., 2018). Between 1990-2010, there were about 63 million new urban residents, 40 million of whom were in urban Java. The urban population in Java Island was around 38.3 million people in 1990 to 79.9 million people in 2010. This shows that Indonesia's urban population is concentrated on Java Island. SUPAS 2015 estimates that 62.63% of Java's 145.0 million population belongs to the urban population or 66.97% of Indonesia's entire urban population.

This is in line with the shift from rural to urban communities, which has implications for land conversion for priority developing industrial and service infrastructure in Java. As a result, the need for community readiness is strengthened to apply organic farming based on bio-cyclo technology in peri-urban areas. This research purpose to analyze the transformation of conventional food agriculture to sustainable organic urban farming for future food.

The transformation occurs from conventional food farming in rural communities to urban farming in peri-urban communities. This transformation occurred due to the conversion of agricultural land to non-agriculture. The land is used for developing public transportation infrastructure and industrial supporting infrastructure. Conventional agriculture is agriculture in rural areas utilizing paddy fields or dry land using chemical fertilizers and pesticides. This condition is transformed towards sustainable organic urban farming, namely agriculture on yards and unused land around settlements using non-chemical fertilizers and pesticides. In the peri-urban community using bio-cyclo farming technology. The transformation that occurs from agriculture that is not environmentally friendly and unhealthy to agriculture that is environmentally friendly, healthier, and has prospects for sustainability in the future.

In relation to the transformation of healthy food and future food in peri-urban communities, bio-cyclo farming technology is applied. The development of organic agriculture has the potential to shift the high use of fertilizers and chemical drugs for agricultural cultivation among farmers. The community does not utilize the domestic waste. The urgency of this research, besides the importance of implementing bio-cyclo and urban farming innovations to optimize the use of yardland, also considers food crisis, self social engineering, and creative social energy for food sustainability in community empowerment.

Literature review

The innovation of using yards with urban-farming turns out to be an alternative solution to the threat of household food security (Sumardjo et al., 2020, 2019). The substitution of fulfilling

the need for vegetable food can actually be met by implementing urban farming. Even for certain commodities from the innovation, the results can be sold to meet the needs of animal side dishes. Bio-cyclo farming is an agricultural system that converts the land area and various forms of cultivation into an integrated farming system (Sholichah & Wahyuni, 2019). Besides being able to take advantage of the problem of organic waste, bio-cyclo farming technology is also an innovative solution in meeting the need for organic fertilizers for urban farming to produce healthy food.

The primary purpose of using land yards in urban areas is to provide affordable and healthy food for the families living there. By using bio-cyclo farming innovations, these yards economically can provide substitution for food needs. Management of urban yards can function as living barns, living stalls, and living pharmacies. The role of using yards in urban farming, in addition to functioning as an economic source, is also a medium of social cohesion for the community (Sumardjo et al., 2021; Sumardjo, Firmansyah, & Manikharda, 2019).

Community empowerment through waste management integrated with home gardening is designed to reduce the amount of waste produced from households, and support family food security. Considering the threat of increasing domestic waste, Indonesia needs to take measures to address the problem. In 2020, Indonesia generated 67.8 million tons of waste. This number is predicted to increase to 70.8 million tons by 2025. The biggest waste contributor is household activities, which account for 42.1 percent of all waste. Research conducted by Sustainable Waste Indonesia (SWI) has shown that, as much as 24% of waste in Indonesia is not managed effectively (CNN Indonesia, 2018b; KLHK, 2021a, 2021b). The waste problem is one of the major challenges the government will need to overcome in order to reach the SDG target by 2030.

Indonesia faces a number of serious threats related to food insecurity problems, including the waste problem and the conversion of agricultural land to non-agricultural purposes. Satellite imagery from 2013 shows that 7.75 million hectares of paddy fields were converted to 7.1 million hectares in 2018 (CNN Indonesia, 2018a). This is equivalent to an average of 130,000 hectares being converted each year. To anticipate these two problems, applying bio-cyclo farming innovation that integrates household waste management and farming activities in the yard is the right choice. It is in line with the paradigm shift in sustainable agriculture that applies environmentally friendly production principles (Zulvera et al., 2014).

Bio-cyclo farming is an agricultural system that utilizes biological cycles, namely combining and utilizing recycled household waste and livestock and fish waste produced by the community to become inputs for agricultural activities (Agus et al., 2020; Dwikoranto et al., 2015; Sholichah & Wahyuni, 2019) . This is also called an integrated organic farming system (Dwikoranto et al., 2015). The application of bio-cyclo farming is very useful in managing household waste and supporting food security through agriculture in the yard. Organic urban farming with bio-cyclo

innovation produces economic and environmental benefits (Sumardjo et al., 2022; Sumardjo, Firmansyah, & Manikharda, 2020). Bio-cyclo farming innovation is an effort to realize a reduce, reuse, recycle (3R)-based waste management system to create a clean and free area from waste while increasing family food security (Sumardjo, Firmansyah, & Manikharda, 2020). The form of yard farming activities can include production, processing, marketing, and biofuels, especially to meet the daily needs of urban communities (Kaufman & Bailkey, 2000; Linwattana, 2013; Sumardjo, Firmansyah, & Manikharda, 2020).

To strengthen Creative Social Energy (CSE) in peri-urban communities, a concept known as organic urban agriculture is used to help them become self-sufficient in food production. According to Sumardjo et al., (2019) and Sumardjo et al., (2020), CSE is a process of developing the potential and abilities of individuals/communities to be able to solve problems and fulfill their daily needs. The ultimate goal of community empowerment is to help people become self-suficence, prosperous, and dignified (Sumardjo et al., 2014).

Transformation or paradigm change in empowerment is very necessary in order to achieve the goal of empowerment, namely community independence (Sumardjo et al., 2022). The transformation in question is a change from the old model, which emphasizes technology transfer, to a new model that prioritizes human resources, known as the farmer first approach (Chambers et al., 1994). Regarding the transformation of the empowerment paradigm, formulate a shift in the level of empowerment from (1) empowering, (2) empowering, and (3) independent. Furthermore, the findings of (Sumardjo et al., 2014, 2022) state that there are 13 aspects to see the level of empowerment, namely approach, social process, initiative, condition, competence, inner mood, communication, relationship status, nature of the intervention, agent capacity, development, adoption, and salient attitude. The determinants of community empowerment are the quality of program implementation, environmental support, farmer characteristics, and the accuracy of the learning process (Aminah et al., 2015). Community empowerment affects the application of agricultural technology (Suryani et al., 2017), business sustainability (Sudarko et al., 2020), and food security (Indah et al., 2020; Sumardjo, Firmansyah, & Dharmawan, 2020; Sumardjo et al., 2016; Sumardjo, Firmansyah, & Manikharda, 2019; Syarief et al., 2014)

The new target of this research is the transformation of the paradigm of community empowerment in the domestic waste management program through the application of bio-cycle farming to support food security. Research that examines the application of bio-cycle farming innovations as a result of the empowerment process, which is then linked to household food security, has not been widely carried out. Most of the studies conducted separate studies on aspects of applying their innovations or aspects of food security.

Method

The research method used is Participatory Rural Communication Appraisal (PRCA), where the researcher lives in the research location. This method is a technique for gathering information by involving local communities in decision making, and implementing community development. PRCA is designed to assist communication between communities and their stakeholders. These methods and techniques are useful for identifying, analyzing and understanding community problems. This approach can reveal the conditions before and after the implementation of a community development program. As a result, community participation in community empowerment is an effective process as well as the goal of community empowerment. The facilitator helps develop community participation in decision-making in planning.

PRCA was chosen because of its advantages in using visualization techniques, interviews, and field-based work groups to produce objective, actual, and in-depth information. This participatory approach combines ideas and techniques from a logical framework approach, process and planning in goal-oriented community empowerment (Anyaegbunam et al., 2004). The various transformations that occur are analyzed from the application of the empowerment method as shown in **Table 1.**

The study location is Karanganyar Village, Kandanghaur District, Indramayu Regency, West Java Province. The study location was chosen because this location is one of the villages with problems in managing household waste. In addition, this village is one of the operational ring 1 villages of PT Pertamina EP, which received assistance from an organic farming-based empowerment program. Mentoring activities are carried out by private extension workers who the company finances.

Table 1 Implementation of the organic household waste utilization program for integrated Agriculture bio cyclo farming in Karanganyar village

Activity	Indicator	Time	Target
Socialization/ Awareness Program	There are 30 people who attended the activity	October 2018	The community and officials of Karanganyar Village
Formation of Women Farmers Group in Karanganyar Village	There are 15 women who are willing to become members of the KWT and the formation of a decree for the Women Farmers Group in Karanganyar Village	January 2019	The community and officials of Karanganyar Village

Activity	Indicator	Time	Target
Training on Making MOL and organic fertilizer	There are 30 trainees who can make MOL, POC, compost and plant cultivation	January 2019	Ampel Bereri Women's Group and Karanganyar Village Environmental Cadres
Procurement of Supporting Facilities and Infrastructure	Availability of demonstration plots and agricultural production infrastructure	January – March 2019	Radiant Ampel Farmer Women's Group
Group Capacity Building (Comparative Study to KT Cai Mulang Jaya)	There are 15 members of the Ampel Berseri KWT as participants in the comparative study	June 2019	Radiant Ampel Farmer Women's Group
Horticultural Cultivation Assistance in Group Demonstration, and KWT members' home yards	- Existence of demonstration plot garden as a model for organic horticulture cultivation. - Utilization of yard land	January 2019 – February 2021	Radiant Ampel Farmer Women's Group
Farmer's Lecture	Increased knowledge capacity of Farmer Group members	Jan 2019 -Feb 2021	Radiant Ampel Farmer Women's Group
Manufacture of Processed Food	Harvest results from the group demonstration plots and yards are processed into processed food products	Jan 2019 - Feb 2021	Radiant Ampel Farmer Women's Group
PIRT Registration of Processed Food Products to the Health Office	Tomato Dates Processed Food Products are registered with the PIRT at the Health Office	December 2019	Radiant Ampel Farmer Women's Group
Biocyclo Farming Cultivation Training	There are 30 trainees who have insight into biocyclo farming budidaya	February 2020	Ampel Bereri Women's Group and Karanganyar Village Environmental Cadres
Green Karanganyar Competition	There are 10 areas that implement integrated waste management	March – June 2020	Karanganyar Village Community

Result and discussion

The analysis of this study includes four transformations, namely: healthy food, organic urban farming, bio-cyclo technology, peri-urban community, and self-social engineering. In addition, it explains the impact of self-social engineering in empowering peri-urban communities through strengthening Creative social energy on the achievement of several SDGs. This transformation coincides so that it requires the intervention of external parties but is committed to placing the internal community as the subject of the changes that occur. Following are the results of the analysis of the ongoing transformation in society.

1. Healthy food transformation through bio-cyclo farming innovation for organic food products

Conventional food is a non-organic agricultural product using chemical fertilizers and pesticides. At the same time, organic urban farming is a household product that uses a production process with the input of bio-cyclo farming innovation that utilizes domestic organic waste. The positive impact of this shift is that people consume organic urban farming products in the form of vegetables, such as kale, spinach, mustard greens, and chilies. There are types of fruit plants such as mango, crystal guava, blueberries, oranges, srikaya, mulberry, and star fruit. Besides fruits and vegetables, there are also medicinal plants, such as bitter, mint, red ginger, white ginger, and lemongrass. Some of the products are sold for around 30%, and the sales proceeds are used to buy animal food from the market, such as fish, eggs, and meat.

2. Transformation of organic urban-farming by bio-cyclo technology innovation in the yard.

The transformation occurs in the form of yards that are not productive and are threatened with the pollution because they are not used for food products, shifting to organic food products resulting from the application of bio-cyclo farming innovations. This innovation applies domestic household waste in the form of organic waste, such as rice washing water and waste from consuming vegetables, fruit, and rice. The benefit obtained is the availability of clean air in the form of oxygen from organic plant products in the yard/non-productive lands around the settlements. The description of group activities in the yard use is shown in **Figures 1 and 2.**

Figure 1 Preparation of planting media by farmer groups

Figure 2 Mutual cooperation activities for plant maintenance by members of farmer groups

The bio-cyclo farming innovation was applied at the study site to manufacture Liquid Organic Fertilizer (POC). POC is a liquid fertilizer derived from organic materials such as fruit peels, fruits, vegetables, a mixture of bran/flour, fertilizer materials, compost, and microorganisms produced through a fermentation process for 7-14 days. The role of POC as fertilizer is to fertilize plants and improve soil structure. The method of making POC is: (1) Put water into the bucket up to 1/3 volume + rice washing water/coconut water; (2) Put the solids into the Bucket and Make Sure to Sink; Dissolve molasses, bran, and bio activator/EM4/MOL into a measuring cup/bottle; (3) Put Solid Fertilizer / or Manure in the Bag + POC / NPK Tightly Tie and Immerse in the fertilizer bucket; (4) Stir until smooth and make sure everything is dissolved. If all the ingredients have been entered, then add water up to 90-95% of the water volume. (5) Close the Bucket Tightly and Sealed. Make sure every 3 days it is opened and closed again (gas exhaust). (6) Fertilizer can be used / So if there is no gas and the smell of tape smells good, it is estimated around 7-14 days; longer, up to 30 days, is better. (7) Harvesting: filter the POC solid waste (which can be composted), then use a t-shirt or cloth to filter the POC solution, put the POC solution into a bottle and store it in a place that is not exposed to direct sunlight.

3. Peri-urban community transformation

Rapid urban development has an impact on the transformation of agricultural land in rural areas to non-agricultural ones to meet the needs of industrial infrastructure and services. This transformation is marked by a shift in society from rural to peri-urban, namely from conventional non-organic farming community culture to modern organic agriculture. From a society characterized by gemeinschaft leading to gesellschaft. Society has shifted from having a "guyub (friendly)" character and prioritizing togetherness in feelings (emotional solidarity) to a society characterized by society (rational solidarity), namely "patembayan" (Gesellschaft) and "self-interested" or rational. However, this shift creates an imbalance process in solidarity between people who are innovative toward bio-cyclo farming and people who are slow in adapting to organic urban farming. People who are more adaptive to innovation occur in posyandu cadres, who are cosmopolitan and visually have experience outside the social system of the local community. Apart from being a *Posyandu* cadre, the figure in question also works as a tour guide so that they have the confidence to dig up wider information related to changes in society.

4. Self-social engineering transformation for CSE improvement.

If organic urban farming is currently in the process of sustainable transformation, then this is the future provision of healthy food for the community. The success of the transformation of conventional food consumption to healthy food products is determined by the effectiveness of communication in changing people's behavior through integrated service posts (Posyandu) activities which become a medium for changing people's behavior, especially the occurrence

of awareness among Posyandu cadres. Between Posyandu cadres and the community, there is a dialogue process so that there is a process of change from, by, and for the community itself. The process of changing food consumption behavior in this community illustrates the occurrence of self-social engineering (SCE) as Sumardjo et al. 2021 on the concept of sodality in community empowerment. This self-social engineering occurs through the determination of ideals, ideas, and friendships by the community itself in the process of community empowerment. It is in line with what (Sumardjo et al, 2020) meant as CSE. The ideals or ideal conditions that the community in Karanganyar Village want to realize are in the form of an anticipatory adaptive attitude towards changes in the conventional farming environment to organic farming. The women farmer group members agreed on ways (ideas) for the community to realize ideals by implementing an integrated farming system through bio-cyclo farming innovations and integrative agribusiness systems. The clarity of these ideals and ideas has guided the community to strengthen internal social capital (friendships) in the form of internal cohesiveness and strengthen cooperation networks (social capital) with external parties, especially in marketing organic urban farming products. An overview of group activities in community empowerment with a self-social engineering (SCE) approach is presented in **Figure 3**

The application of the CSE concept in community empowerment seems to be inspired by the Creative Social-Culture Energy (CSCE) concept from (Cohen & Uphoff, 1980; Uphoff, 1992) and the results of a study by (Sumardjo, 1994) in poor areas of East Nusa Tenggara. When CSE has become entrenched in the peri-urban community, it is possible to become CSCE.

Figure 3 Sharing knowledge among farmer group members

The impact of self social engineering on the achievement of the SDGs

Various transformation processes that occur in community empowerment have placed self-social engineering as the main paradigm. The effectiveness of the empowerment process is influenced by the ability of the empowered to apply convergent communication or known as participatory communication, which prioritizes "dialogue" among community empowerment participants. It is a synthesis of Kincaid and Rogers's (2003) communication theory and the concept of the dynamics of social development in realizing people's welfare (Sumardjo et al., 2021).

The application of self social engineering in community empowerment in Bongas Wetan Village has shown a tendency to impact the achievement of several aspects of the SDGs positively. In this study, there are 9 aspects of the 17 aspects of the achievement of the SDGs. More details can be seen in **Table 2.** The shift from rural to peri-urban communities is influenced by changing from conventional agriculture to an urban organic farming system with a choice of commodities that are not foreign to people's food consumption. This approach seems to be the community's choice for future food security for peri-urban communities.

Conclusion

- The results showed that the self-social engineering approach, by placing the community as the subject, really effectively strengthened creative social energy, namely ideals, ideas, and friendships, in developing organic urban farming. In addition, there has been a transformation in the fulfillment of healthy food for the community and the realization of several aspects of the SDGs.
- The importance of self-social engineering in the development of creative social energy for community empowerment as a solution to the problem of healthy food and future food in peri-urban communities.

Recomendation

Alternatives for future food health and food sustainability in peri-urban communities are suggested to use a creative social energy strengthening approach developed through participatory self-social engineering. In the future, the study of the sustainability of peri-urban community empowerment is mainly related to the economic value of choices, especially market-oriented commodities.

Table 2 Achievement of SDGs on the impact of organic urban farming community empowerment in Karanglayung village, Kandanghaur district, Indramayu

SDGs Number	SDGs Indicator	Empowerment Impact Indicator	Description
1	No poverty:	Efforts to eradicate poverty	15% increase in income
2	Zero hunger	Efforts to achieve food security and nutrition improvement, and promote sustainable agriculture	Improvement of organic farming production: • 21,75 kg/household/month of fresh organic vegetables, • 14,20 liters/household/month of local micro-organisms for seed fertilizer, and • 25 kg/household/month of solid organic fertilizer
3	Good health and wellbeing	Promote healthy lifestyle and support welfare for all ages	• Application of organic farming with biocyclo farming innovation • Produce healthy (organic) food
8	Decent work and economic growth	Produce products needed by the market	Additional member income Rp 31.000/household/months
11	Sustainable cities and communities	Utilization of the yard to produce products for market needs	Organic urban farming that environmentally friendly
12	Responsible cosumption and production	The product is safe because it is applied organic farming	Free from harmful chemical input and healthy food product
13	Climate Action	The air in the home environment is cooler	Increased oxygen
15	Life on Land	*Zero waste* by bio-cyclo farming	Integrated farming system and free organic waste
17	Partnerships for the Goals	Synergi internal and external partnership	Improving internal and external social capital

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Conflict of interest statement

This research is basic research science and does not contain any conflict of interest.

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E-government adoption of local government units in one Province in the Philippines

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Abstract

E-government offers several opportunities and benefits in local governance. The primary goal of e-government is to promote efficient, responsive, ethical, accountable, and transparent government service. This descriptive study aimed to determine the readiness for e-government adoption of the municipalities, the city, and the provincial government unit of Sorsogon in the Philippines. Structured interviews and documentary analysis were conducted to assess the e-government adoption readiness of these local government units (LGUs) along with the three variables namely technology, organization, and environment. Sixteen key informants participated in the study, comprising LGU's planning and development coordinators and IT Focal Persons. The findings show that the LGUs in Sorsogon are ready to adopt e-government along with technology, but not ready along with organization and environment. Unavailability of an IT office, lack of technical and maintenance teams, and inadequacy of IT personnel are some of the factors that must be addressed for these LGUs to become ready for e-government adoption. In addition, local governments need to develop policies to promote the use of ICT in local governance and strengthen linkages with the private sector and other government agencies to adopt e-government.

Keywords: e-government adoption, e-government, local government units, Sorsogon, ICT

Introduction

Information and communication through the use of modern technologies promote growth and development. Article II, Section 24 of the 1987 Philippine Constitution provides: "The State recognizes the vital role of communication and information in nation-building." It is through

communication that people are informed of the services, policies, and activities of the government through the use of televisions, newspapers, computers, and other modern information and communication technologies (ICT). ICT is an umbrella term that includes any communication device or application, including radio, television, cellular phones, computer and network hardware and software, satellite systems, and so on (Taher, 2015). It is the totality of electronic means to access, create, collect, store, process, receive, transmit, present, and disseminate information (Department of Information and Communications Technology, 2016).

The developments in ICT have created opportunities for government to deliver greater efficiency (National Audit Office, 2011). Several authors have affirmed the usefulness of ICT in governance. Morse (2011) mentioned that government is knowledge extensive and effective information and sound ICT strategies go hand in hand. According to Patel et. al (2017), big data analytics in e-governance can give rise for effective services and can provide more effective ideas. Similarly, Iglesias (2010) stated that ICT has the potential to improve the interaction among government, business, and citizens. ICT can help improve the delivery of public services, allow greater public access to information, and play an important role in public administration reforms in many countries in Asia and the Pacific (Asian Development Bank,2018). Furthermore, the government uses ICT to make public administration more efficient and effective by cutting red tape (Mukherjee & Roy, 2016). ICTs can also remove unnecessary human involvement during the public service delivery processes from the government thus promoting efficiency and transparency (Mukherjee & Roy, 2016).

The realization of the role and importance of ICT in government paved the way for electronic government or e-government. Section 3 of Republic Act No. 1044 or the Department of Information and Communications Technology (DICT) Act of 2015, defined e-government as the "use of ICT by the government and the public to enhance access and delivery of government services to bring about efficient, responsive, ethical, accountable and transparent government service". The beginnings of e-government in the country can be traced to the creation of the National Computer Center in 1971 to start automating the processes of the Philippine Government (Macapagal and Peralta, 2016). Since then, more laws and policies were promulgated to further promote the use of ICT in governance. Through Republic Act 8792 or the Electronic Commerce Act of 2000, all government agencies were mandated to use electronic data messages, electronic documents and electronic signatures to facilitate online transactions with the public (Official Gazette, 2000).

However, some studies revealed the slow adoption of e-government. Nguyen (2016) mentioned that the adoption rate of e-government initiatives over the world is far from expectations despite of huge resource. Siar (2005) revealed the minimal adoption of e-governance by the majority of the city governments in the Philippines and the underutilization of their websites as

e-governance tools. Cruz (2014) revealed that e-government in local government units (LGUs) in the country can be considered as still on its infant stage.

Arpaci et. al (2012) stated that the adoption of information technologies is a crucial decision for the growth, productivity, competitiveness and survival of organizations. In addition, the authors affirmed that in studying the adoption of ICT, the technological, organizational and environmental contexts must be considered. With this, the researchers anchored this study on the Technology-Organization-Environment (TOE) framework by Tornatzky and Fleischer in 1990.

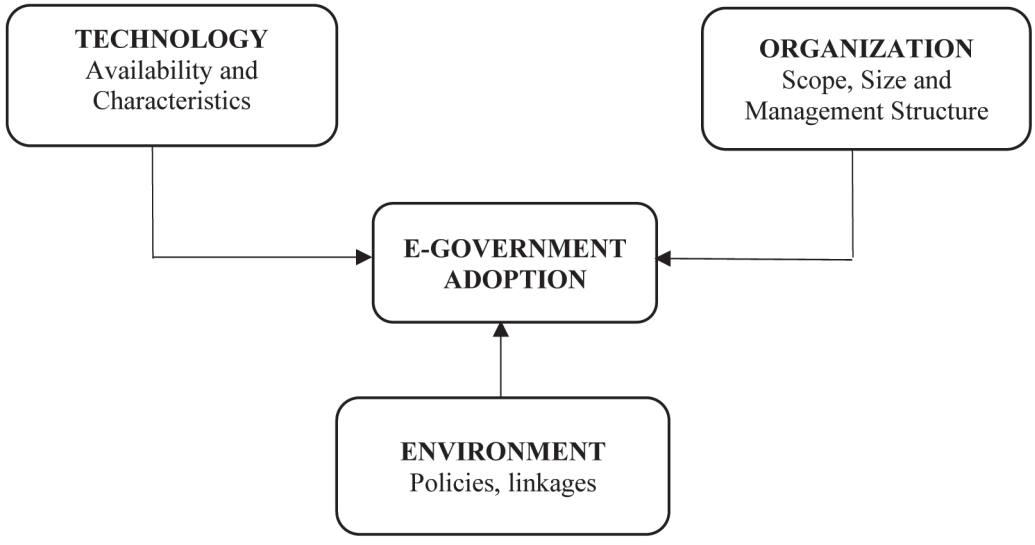

Figure 1 TOE framework adopted from Tornatzky and Fleischer (1990)

In the TOE framework, the process by which a firm adopts and implements technological innovations is influenced by the technological, organizational and environmental contexts. The technological context describes the availability and characteristics of the technologies in the organization. The organizational context refers to descriptive measures about the organization such as scope, size, and managerial structure. The environmental context includes the size and structure of the industry, the firm's competitors, the macroeconomic context, and the regulatory environment.

The TOE framework has been used successfully in the study of IT adoption within organizations. The said framework provides a useful analytical framework that can be used for studying the adoption and assimilation of different types of IT innovation (Oliveira & Martin, 2014). They also mentioned that the TOE framework has a solid theoretical basis and consistent empirical support. The TOE framework can be used as a method to study adoption of e-government

and contribute a new understanding and model enhancement for academics as well as practitioners and policy maker (Alqahtani, 2016). Moreover, Muhamad (2021) stated that the TOE framework can serve as a strong theory for understanding the degree to which technology is adopted. With these, the researchers chose the TOE framework as guide in evaluating the e-government adoption readiness of the LGUs in the Province of Sorsogon, Philippines. The researchers also believed that before any government unit implement an innovation, certain factors in the technology, organization and environment context needs to be addressed. Therefore, the need to conduct a study on e-government adoption readiness was deemed necessary.

Sorsogon is a province in the Philippines located in the Bicol Region. It is the southernmost province in Luzon and is subdivided into fourteen municipalities and one city. The municipalities include the following: Barcelona, Bulan, Bulusan, Casiguran, Castilla, Donsol, Gubat, Irosin, Juban, Magallanes, Matnog, Pilar, Prieto Diaz, and Sta. Magdalena. Its capital is Sorsogon City and borders the province of Albay to the north (Local Government Academy, 2021). As Sorsogueños, the researchers observed that most of the transactions in the LGUs of Sorsogon were done manually. As constituents who availed of their service, the researchers also observed that some of the processes in the offices were aided with computers but majority of these processes were not automated. In addition, not all LGUs in the province have their official websites which was mandated by RA 8792 making it more difficult for the constituents to know about their programs and services especially during disrupted times like this pandemic. With this, the researchers looked into the e-government adoption readiness of the LGUs in Sorsogon along technology, organization and environment.

Methods

This descriptive research study employed structured interview and documentary analysis to gather the needed data. Structured interview was conducted to determine the e-government adoption readiness of the LGUs along with technology, organization, and environment. To verify the accuracy of data, documentary analysis was conducted for triangulation purposes.

Participants

Sixteen key informants (KIs) comprised of the Planning and Development Coordinators and the IT focal persons of LGUs were involved in the study. Based on Article 6, Section 476 of the Local Government Code of the Philippines, the Planning and Development Coordinators are involved in the formulation, implementation, monitoring, and evaluation of the different developmental programs, projects, and activities in the LGU. The Local Government Operations

Officer of the Department of Interior and Local Government (DILG) - Sorsogon Provincial Office and the Provincial Team Lead of the Department of Information and Communications Technology (DICT) in Sorsogon also affirmed that these KIs were the people who could provide significant inputs regarding e-government implementation in the LGUs. Thus, the researchers chose them as KIs of the study because they were the knowledgeable persons who could provide the much-needed data. The majority of them were male and had served significant years of service in their respective LGUs.

Data Collection

The instrument of the study was an interview guide which was utilized to assess the readiness of LGUs for e-government adoption. A review of relevant literature and related studies and consultation with the DICT Provincial Team Lead was conducted in the preparation of the instrument. The interview guide was shown to some experts and the DICT Provincial Team Lead for their suggestions and validation purposes.

The first part of the interview guide tackled the KI's profile. Questions regarding the name of the interviewee, department/unit where he/she belongs, his/her position or designation, number of years in the LGU, contact number, and email address were included. The second part of the interview guide dealt with the KI's knowledge of e-government. Questions regarding their familiarity and definition of e-government, the role, and importance of e-government in the LGUs, and the plans and programs of the LGU regarding ICT and its utilization in local governance were also included. The third part dealt with the e-government adoption readiness of LGUs along with technology, organization, and environment. It consisted of closed-ended questions on LGUs' capacity and capability to implement e-government along the variables mentioned. The last part of the instrument consisted of questions on the issues and challenges affecting e-government adoption and their suggestions to ensure effective implementation.

Letters requesting permission to conduct the studies in said LGUs were prepared and forwarded to the offices of the Local Chief Executives. Upon their approval, interviews and documentary analysis were conducted from June to September 2018. The face-to-face interviews with KIs from Casiguran, Gubat and Sorsogon City were conducted on June 21, 2018 at their respective offices. Interview with KI from the Provincial Government (PG) of Sorsogon was conducted on July 10, 2018. While the interviews with KIs from Bulan and Irosin were conducted on July 12 and 20, 2018 respectively.

The interview with KI from Sta. Magdalena was conducted on August 1, 2018. While the interviews with KIs from Castilla, Donsol and Pilar were done on August 2, 2018. The other

schedules of interview with KIs were conducted on the following dates: August 4, 2018 for Juban; August 9, 2019 for Matnog; August 16, 2008 for Barcelona and Bulusan; and August 23, 2018 for Prieto Diaz and Magallanes. To validate the data provided by the KIs, the researchers reviewed documents, communication letters, memorandum of agreements, resolutions, certificates and other relevant records.

Data Analysis

A scoring system was utilized to interpret the results on the e-government adoption readiness of LGUs. It is a system of classifying according to merit. A scoring system may also be used to appraise the qualitative and quantitative components of mixed methods research (Pluye et. al, 2009). Along with technology, the adjectival description "very much ready" was used to interpret scores of 6 to 8. Adjectival description "ready" was used to interpret scores of 3 to 5. While scores 0 to 2 mean "not ready" for e-government adoption. Along with organization, scores 4 to 5 and 2 to 3 mean "very much ready" and "ready", respectively. The 0 to 1 score along organization means "not ready". For e-government adoption along with the environment, a score of 4 means "very much ready". While scores 2 to 3 and 0 to1 mean "ready" and "not ready", respectively.

Discussion (Results and Discussion)

E-government Adoption Readiness along Technology

Technology, as used in this study, refers to the hardware, software, methods, system, and other technologies in support of e-government activities of the LGUs. Table 1 shows the LGUs' e-government adoption readiness along with technology. The average score of 4.06 indicates that LGUs were ready for e-government adoption along with technology.

Individual scores revealed that Castilla and Gubat were very much ready. Both obtained a score of 7. Except for ICT Strategic Plan, they have most of the indicators along with technology. Meanwhile, Sorsogon City, Barcelona, Bulan, Bulusan, Donsol, Irosin, Juban, Magallanes, Pilar, Prieto Diaz, Sta. Magdalena and the Provincial Government of Sorsogon were described as ready for e-government adoption along with technology. Regarding their scores, they still need ICT Strategic Plan, LAN, computer or network servers, and sufficient funds to become very much ready for e-government. On the other hand, Casiguran and Matnog were not ready for e-government adoption along with technology. Based on their scores, these LGUs do not have the identified indicators such as ICT Strategic Plan, e-government fund, LAN, servers, internet connection with enough bandwidth capacity, and online/offline tools or programs.

Table 1 E-government adoption readiness of LGUs along technology

LGUs	E-Government Adoption Indicators								Score	Adjectival Description
	A	B	C	D	E	F	G	H		
Sorsogon City									5	Ready
Barcelona									3	Ready
Bulan									4	Ready
Bulusan									5	Ready
Casiguran									2	Not ready
Castilla									7	Very much ready
Donsol									4	Ready
Gubat									7	Very much ready
Irosin									4	Ready
Juban									3	Ready
Magallanes									3	Ready
Matnog									2	Not ready
Pilar									4	Ready
Prieto Diaz									3	Ready
Sta. Magdalena									3	Ready
Provincial Govt. of Sorsogon									6	Ready
								Average Score	4.06	Ready
								Standard Deviation		1.57
								Range		2.49-5.63

E - Government Adoption Indicators:

A - The LGU has an ICT strategic plan that is duly approved and is being implemented.

B - There is sufficient fund for e-government projects

C - There is a stable internet connection with enough bandwidth capacity per office.

D - Local area network (LAN) is available in the offices.

E - There are sufficient number of computer units and other ICT devices such as printer, scanner and other ICT devices per office.

F - Computer/network servers are available and secured

G - Online and offline tools and programs are available.

H - Telecommunication providers are available in the LGU

Legend: Indicator present in LGU Indicator not present in LGU

The findings showed that Bulan and Sta. Magdalena has an equivalent plan for e-government. KI from Bulan discussed that the LGU has had an e-government program for five years in partnership with Sorsogon State University. The LGU considered that as their guide in establishing frontline application systems. The hardware, software, and other technical requirements to implement e-government were specified in the plan. KI from Sta. Magdalena mentioned that the Comprehensive Development Plan of LGU specifically under the Institutional Development Sector includes the following ICT plans: Municipal GIS database, revenue generation program, and computerized tax revenue and collection system. The KI mentioned that these were slowly being implemented due to budget constraints.

Section 2, of Executive Order No. 265, Series of 2000 mandated all government agencies including LGUs to align their respective computerization projects with the priorities identified in the Government Information System Plan (Official Gazette, 2000). As a result, the National Computer Center last 2003 mandated all government agencies to come up with an Information Systems Strategic Plan (ISSP) through NCC Memorandum Circular No. 2003-02 entitled "Prescribing a Standard Template for the Information Systems Strategic Plan." The ICT Strategic Plan or Information Systems Strategic Plan (ISSP) presents the overall strategic plan for the development and implementation of information systems, the use of ICT, as well as the corresponding resource requirements over a fixed long-term period (MITHI, 2003). Likewise, the ISSP is considered a tool to ensure ICT application in strategic areas of government concern (MITHI, 2003). The results imply that most of LGUs in the province does not have an ISSP. KIs revealed that ICT programs were not yet included in the executive and legislative agenda of the LGUs. These were not yet their priorities hence there was no funding allotted for the moment. Delivery of basic services remains as the LGUs' top priority according to KIs.

This study also disclosed that Bulusan, Castilla, Donsol, Gubat, Irosin, and Pilar have funds for e-government according to KIs. Of the 14 municipalities, only Bulan and Pilar were considered first-class by income classification. Irosin and Gubat are considered second-class municipalities. Castilla, Donsol, Magallanes, and Matnog are considered third-class municipalities. Casiguran, Bulusan, and Juban were classified as fourth-class municipalities. While LGUs Barcelona, Prieto Diaz, and Sta. Magdalena are classified as fifth-class municipalities. Sorsogon City is considered a third-class city while the Province of Sorsogon is a second-class province by income classification in the Philippines.

The results signify that majority of the LGUs do not have sufficient funds for e-government projects. In an interview, KIs stated that there was no specific fund for e-government. But each department has a fund that can be utilized for training of employees and the purchase of computers

and other devices. KIs from Bulusan, Castilla, Donsol, Gubat, and Irosin mentioned that their respective LGUs can provide funds for e-government projects especially if included in the priority lists of the administration. Only the priority programs and projects of the LGUs were allotted with budget or funds.

On the other hand, based on secondary data and interviews with KI, Bulan had Sangguniang Bayan resolutions that supported the provision of funding for LGU's e-government program with Sorsogon State University. However, since there was no fund appropriation yet, the program was not yet implemented. Teresa and Camba (2004) affirmed that the lack of funds to finance technological initiatives was considered the perennial stumbling block to ICT development programs. Similarly, Warf (2014) stated that governments in low-income countries, are the least likely to adopt e-government. Therefore, LGUs may consider including e-government as one of their priority programs and ensure to allocate budget for its implementation.

This study also revealed that Barcelona, Bulusan, Castilla, Donsol, Gubat, Magallanes, Pilar, Prieto Diaz, and the Provincial Government of Sorsogon have a stable internet connection with enough bandwidth capacity per office. According to KIs, the Wi-Fi services in the offices of these LGUs were provided by different Internet Service Providers. They also disclosed that although the Internet was available, the speed is very slow, thus hampering the online activities of these LGUs. DILG affirms the findings of this study. In 2017, during the National LGU IT Summit in Pasay City, Philippines, it was revealed that low bandwidth subscription and slow internet connectivity were some of the challenges in using ICT in local government processes (Department of Interior and Local Government, 2017).

It was also found that Sorsogon City, Gubat, Castilla, and the Provincial Government of Sorsogon installed local area networks or LAN. A LAN is a group of computers and other devices that are connected over a network and are all in the same location, typically within a single building like an office or home (Gavin, 2018). It offers several advantages to an organization including LGUs. Through LAN, costly ICT resources can be shared by all of the computers, the central backing store can be provided in one place so all work is saved together, the software can be shared, and upgrading is easier too (Revision World, 2018). In government offices, LAN may speed up processes thus promoting efficiency in the delivery of services. As observed by the researcher, most of the office transactions in LGUs were still done manually. Some were aided with computers but most of the processes were not yet automated. Thus, the installation of local area networks seems to be not yet needed by the LGUs.

This study also found out that except for Barcelona, the majority of LGUs have a sufficient number of computer units, printers, scanners, and other ICT devices per office. According to KIs, these computers were used for simple office transactions, encoding, the printing of documents, and other clerical tasks. The KI from Bulan revealed that although there were enough computers in the offices, the hardware specifications were below the standard required for the implementation of LGUs' e-government program. Hence, there is a need to upgrade the existing computers of LGUs to suit the demands for e-government implementation.

This study also revealed that only Sorsogon City, Castilla, Gubat, and the Provincial Government of Sorsogon have available and secured network servers in the LGU offices. As observed, since LANs were not yet available in most of the offices, computer servers seem to be not needed yet in most of the LGUs. However, if these LGUs will automate some of their frontline services soon, LANs including the computer servers will have to be installed and secured.

Sorsogon City, Barcelona, Bulan, Bulusan, Castilla, Gubat, Irosin, Juban, and the Provincial Government of Sorsogon have offline and online tools and programs. These online tools were the web-based programs introduced by other government agencies which were adopted by these LGUs. This study also disclosed that telecommunication service providers are available in all LGUs. According to KIs, the companies such as SMART, GLOBE, PLDT, and DCTV provide telecommunication services in their respective LGUs. Their presence could offer good opportunities for these LGUs to embark on online e-government projects if they so desire.

The results imply that although the average score of these LGUs was interpreted as ready for e-government adoption along with technology, some issues and challenges need to be addressed to ensure the successful implementation of e-government. These include the availability of ICT strategic plan, provision of e-government fund, installation of local area networks and setting-up of secured computer networks and servers. Barker cited in Makau et. al (2015) confirmed that ICT infrastructure in form of computers and other telecommunication hardware and software plays a bedrock role in developing e-government systems. Lallana et. al (2002) affirmed that adequate resources including money must be made available to help achieve the goal of e-government, particularly in its initial stages. Hence, it is recommended for LGUs to be creative in securing the necessary funding so they could acquire the other resources needed to implement their ICT projects.

E-government Adoption Readiness along Organization

As used in this study, the variable organization refers to the organizational set-up of LGUs, human support systems, and capability development programs for e-government. Table 2 shows the e-government adoption readiness of LGUs along with organization. The average score of 1.44 indicates that along with organization, LGUs were not ready for e-government adoption. Only Castilla was found to be very much ready obtaining a score of 5. All of the identified indicators were true to Castilla. Only Gubat and the Provincial Government of Sorsogon were ready for e-government along with the organization. Barcelona, Bulan, Bulusan, Donsol, Irosin, Juban, Magallanes, Matnog, Pilar, Prieto Diaz and Sta. Magdalena were not ready for e-government along with organization. Unavailability of IT office, lack of maintenance and technical teams, and inadequacy of IT personnel were the observed challenges.

This study revealed that Sorsogon City, Bulan, Castilla, Donsol, Gubat, Irosin, Magallanes, and the Provincial Government of Sorsogon have IT experts that can provide theoretical and technical specifications to implement e-government. KIs mentioned that some employees in LGUs were given designations as focal persons for IT developments. But it is only in Castilla where an IT Unit Head manages the IT Unit of the LGU. Based on the interviews conducted, it was found out that there was no plantilla position for IT Personnel or staff in the LGUs. In Sorsogon City, there was an ICT In-Charge from the City Planning and Development Office who can assist in the implementation of computerization projects but he was on job order status. The IT Unit head of Castilla is also under job order status. On the other hand, the designated IT In-charge or focal persons in Bulan and Gubat were permanent employees of said LGUs. In Bulan, the Sangguniang Bayan Secretary is the focal person for e-government. While the Supply Officer in Gubat was the designated focal person for IT developments in said LGU.

In the case of Donsol, an employee who holds a permanent position as Internal Auditor was tapped to give technical assistance for IT-related activities. In Irosin, a permanent employee who was assigned to the Municipal Planning and Development Officer as a computer operator was identified to have the skills needed for ICT projects. In Magallanes, a permanent employee in the Mayor's Office was assigned to help in the implementation of ICT-related projects. Similarly, the ICT designate in the Provincial Government of Sorsogon was assigned to the Provincial Planning and Development Office as an economic researcher under the Research Division. She is a permanent employee.

Table 2 E-government adoption readiness of LGUs along organization

LGUs	E-Government Adoption Indicators					Score	Adjectival Description
	A	B	C	D	E		
Sorsogon City	■				■	2	Ready
Barcelona						0	Not ready
Bulan	■					1	Not ready
Bulusan					■	1	Not ready
Casiguran				■	■	2	Ready
Castilla	■	■	■	■	■	5	Very much ready
Donsol	■					1	Not ready
Gubat	■		■		■	3	Ready
Irosin	■					1	Not ready
Juban						0	Not ready
Magallanes	■			■		2	Not ready
Matnog						0	Not ready
Pilar						0	Not ready
Prieto Diaz					■	1	Not ready
Sta. Magdalena					■	1	Not ready
Provincial Govt. of Sorsogon	■		■		■	3	Ready
					Average Score	1.44	Not ready
					Standard Deviation		1.36
					Range		2.8-3.80

E - Government Adoption Indicators:

A - The LGU has an IT expert capable of providing the theoretical and technical specifications to implement e-government.

B - The LGU has an IT office equipped with the necessary equipment to implement processes in support of e-government.

C - There is a maintenance and technical team who will help maintain the functionality of computers.

D - There is adequate number of IT personnel.

E - ICT Trainings and seminars are provided to officials and employees

Legend: ■ Indicator present in LGU ■ Indicator not present in LGU

Lallana et. al (2002) emphasized the importance of IT champions in the realization of e-government projects. According to the authors, the IT champions will have to set goals and targets for their respective agencies, determine the types of applications they feel their constituents need and find creative means to deploy resources. However, Satyanarayana (2006) cited the shortage of champions or experts as one of the challenges in e-government. Likewise, DILG (2017) confirmed that the unavailability of plantilla items for ICT staff impedes the implementation of ICT projects in local government units. With this, the researcher recommends that LGUs hire and create plantilla positions for employees who are experts in the field of ICT to start implementation and ensure the sustainability of e-government projects.

This study also revealed that only Castilla has an IT office. According to KI, the office was established in December 2016 under the Office of the Mayor. Said office facilitated ICT developments in Castilla. The results signify that there must be an IT office that will spearhead ICT projects. Pederson (2016) lends support to the findings of the study. He revealed that insufficient structures for IT management were one of the barriers to e-government along the organizational level in local government. Hence, LGUs may consider looking into this issue and provide or set up a unit whose tasks are primarily focused on implementing ICT projects.

This study also found out that only Castilla, Gubat, and the Provincial Government of Sorsogon have maintenance and technical teams. KIs revealed that the teams that will help maintain the functionality of computers in their respective LGUs were not yet organized. However, in case of technical problems, the office concerned would ask for assistance from the identified expert. Other employees who know basic troubleshooting was tapped for minor computer problems. If the problem was not addressed or solved, they do outsource by paying technicians from computer shops within or outside their municipalities. Hence, this study confirms that the lack of workforce (Magno & Serafica, 2001) and the inadequacy of IT personnel (Pederson, 2016) were barriers to e-government. Therefore, if LGUs in the province will embark on e-government projects, they must ensure that they have enough manpower particularly the maintenance and technical team who will see to it that computers are working properly as expected. It was also disclosed in this study that only Casiguran, Castilla and Magallanes have adequate number of IT personnel. Magno and Serafica (2001) also revealed the inadequacy of IT personnel in national line agencies and some local government units in the Philippines. They also confirmed the difficulty in attracting qualified people and retaining highly skilled government IT staff who are lured by private companies or work abroad (Magno and Serafica, 2001). With this, LGU officials may consider looking into this issue especially if they will implement e-government projects.

This study found out that Sorsogon City, Bulusan, Casiguran, Castilla, Gubat, Prieto Diaz, Sta. Magdalena and PG-Sorsogon have provided ICT training and seminars to their officials and employees. KIs disclosed that some employees were sent to training and seminars related to ICT. Most of this training was initiated by other agencies. KIs also mentioned that only very few were given the chance to attend training related to ICT. In addition, they observed that LGUs seldom conduct in-house training that will help develop or improve the computer skills of the officials and employees.

Magno and Serafica (2001), in their study, also revealed the lack of literacy training and lack of advanced skills by the IT section in some national line agencies and some LGUs in the Philippines. Khan (2014) also disclosed that training has a positive impact on e-government adoption. Likewise, Alshehri and Drew (2010), recommended that government should train its employees and citizens in basic skills of dealing with the computer and the Internet in order to let them participate in e-government development applications. Thus, the researchers of this study recommend for LGUs in the province to consider conducting an ICT training needs analysis so that they would have a solid grasp of the knowledge and skills needed by their officials and employees for e-government adoption and implementation. In addition, more in-house training may be conducted to provide an avenue for the capacity development of all its employees and officials.

The results imply that the local governments are not ready for e-government adoption along organization. Several issues need to be addressed such as the lack of ICT office with enough manpower and equipped with necessary equipment to implement processes in support of e-government. Pederson (2016) affirmed that the lack of structures for IT management is one of the barriers for e-government along organizational level in local government. An office dedicated to focus on ICT developments in the LGU will greatly contribute to successful e-government implementation.

E-government Adoption Readiness along Environment

The term environment refers to the elements within or outside the organization that has the potential to affect all or part of the organization (Stewart, 2016). In this study, the variable environment refers to legislative support and linkages of LGUs to implement e-government. Table 3 presents the e-government adoption readiness of LGUs along with environment. The average score of 1.56 indicates that LGUs were not ready for e-government adoption along with environment. Individual scores revealed that only Sorsogon City, Bulan, Bulusan, Castilla, Gubat, Sta. Magdalena and PG-Sorsogon were ready for e-government adoption along with environment. But the majority of LGUs including Barcelona, Casiguran, Donsol, Irosin, Juban, Magallanes,

Matnog, Pilar, and Prieto Diaz were not ready for e-government adoption along with this variable. As shown in the tabular data, most of these LGUs do not have policies related to the use of ICT in local governance, do not have policies on computer security, and did not collaborate with private agencies for e-government.

Table 3 E-government adoption readiness of LGUs along environment

LGUs	E-Government Adoption Indicators				Score	Adjectival Description
	A	B	C	D		
Sorsogon City	■		■	■	3	Ready
Barcelona			■		1	Not ready
Bulan	■	■	■		3	Ready
Bulusan			■	■	2	Ready
Casiguran			■		1	Not ready
Castilla	■		■		2	Ready
Donsol			■		1	Not ready
Gubat	■		■		2	Ready
Irosin			■		1	Not ready
Juban			■		1	Not ready
Magallanes			■		1	Not ready
Matnog			■		1	Not ready
Pilar			■		1	Not ready
Prieto Diaz			■		1	Not ready
Sta. Magdalena			■	■	2	Ready
Provincial Govt. of Sorsogon			■	■	2	Ready
				Average Score	1.56	Not ready
				Standard Deviation		0.73
				Range		0.83-2.29

E - Government Adoption Indicators:

A - Policies are crafted and implemented to promote the use of ICT in local governance.

B - Local government officials have written regulations/ policies on computer/data security.

C - The LGU collaborates with other government agencies to implement e-government.

D - The LGU collaborates with private agencies to implement e-government.

Legend: ■ Indicator present in LGU ■ Indicator not present in LGU

This study found out that only Sorsogon City, Bulan, Castilla, and Gubat have policies on the use of ICT in local governance. Based on reviewed documents, there were approved resolutions on the use of the Enhanced Tax Revenue and Collection System in Sorsogon City and Castilla. In Bulan, e-government was included in the executive and legislative agenda of the present administration. That's why Sangguniang Bayan (SB) resolutions and Memorandum of Agreement (MOA) were approved to implement e-government. The results imply that legislative support is needed for e-government to be effectively implemented in LGUs.

A policy within the local government level must be available to ensure compliance and implementation. In one of the cities in the Philippines, the local government officials of Makati City have approved an ordinance such as Public-Private Partnership (PPP) Contract between the City Government of Makati and Neo-Connect ICT Solutions, Inc. for the Makati City Automation Project (Makati City, 2021). Furthermore, the officials approved a contract with Neo-Converge ICT Solutions, Inc. for the project titled Makati City Public Wi-Fi system to deliver managed internet services to the constituents and transients of Makati City. Gichoya (2005) revealed that ICT policy was one of the factors that prevent advancement and restrict successful implementation and sustainability of e-government projects. With this, the researcher encourages the LGU officials in the province to consider formulating policies that will promote the utilization of ICT in local governance.

Meanwhile, KI from Gubat mentioned that memos were written to implement various information systems developed by the IT Focal Person. KIs from other LGUs mentioned that although there were approved SB resolutions, these were mostly to forge MOA with DICT for the implementation of the Technology for Education (Tech4Ed) project and the Free Wi-fi Project in the Philippines (FWPP). The DICT is the primary policy, planning, coordinating, implementing, and administrative entity of the Executive Branch of the government that will plan, develop, and promote the national ICT development agenda (DICT, 2016). DICT plays an important role in the local e-government development. Through the Free Wi-fi Project, it has provided free wi-fi services in public places such as parks, public libraries, schools, government hospitals, train stations, airports, and seaports. This is turn could help more local people to access government services wherever they are.

This study also found out that only Bulan has a policy related to computer and data security. The KI mentioned that part of the e-government program they have conceptualized with Sorsogon State University included the policy on security and restrictions or control when said program is implemented. The results imply that almost all of the LGUs do not have policies related to data or computer security. Whitman et al. cited in Bulgurcu et. al (2001) stated that "organizations create security policies to provide employees with guidelines on how to ensure information security while they utilize information systems in the course of performing their jobs".

The researchers observed that LGUs were not yet computerized so LGUs did not consider yet formulating policies for computer security. However, since computer data security is one of the factors that pose a challenge to the implementation of e-government initiatives (Nkohkwo & Islam, 2013), LGUs in the province must look into this when they embark on e-government projects in the future.

Meanwhile, all of the LGUs collaborated with other government agencies to implement e-government-related projects. LGUs in the province collaborated with other government agencies for their ICT projects such as the following: City Government of Legazpi, Department of Information and Communications Technology, Department of Interior and Local Government, National Anti-Poverty Commission, Government Service Insurance System, Pag-Ibig Fund, Bureau of Fisheries and Aquatic Resources, Department of Health, Department of Budget and Management, Bureau of Local Government Finance, and Department of Agriculture – Agricultural Training Institute. Pederson (2016) cited that the lack of collaboration or partnership with other local governments and other public sectors was one of the barriers to e-government implementation. Hence, the LGUs in the province of Sorsogon may continue working with other government agencies and strengthen linkages to implement e-government projects.

Sorsogon City, Bulusan, Sta. Magdalena and PG-Sorsogon forged a partnership with private agencies for the implementation of e-government projects. Sorsogon City collaborated with GeoData for Geographical Information System. Bulusan partnered with iCreative Services for their website and the Provincial Government of Sorsogon with Smart Communications Inc. for its SoSorsogon Digital Tourism App. Avis (2016) mentioned that the private sector is a key stakeholder in both urban and economic development. He also emphasized that in order to foster partnerships, the municipalities need to build relations with local and foreign private sectors by involving them in strategic planning processes. Likewise, Moatshe (2014) disclosed that the lack of public-private partnership was one of the barriers to e-government projects. Hence, considering the important role of private sectors in development, the LGUs in the province may consider establishing or strengthening partnerships with private sectors for their e-government projects.

The results imply that the local governments in Sorsogon are not ready for e-government along environment. The lack of policies and local legislations to promote ICT in local governance and the lack of partnership between local governments and private sector are observed as barriers for e-government adoption in Sorsogon.

Conclusions and recommendations

Based on the findings, the LGUs in the Province of Sorsogon were ready for e-government adoption along with technology but not ready along with organization and environment. Most of the LGUs in the province do not have an ICT Strategic Plan. ICT programs were not yet included in the executive and legislative agenda of the LGUs. These were not yet their priorities hence there was no funding allotted for the meantime. Also, local area networks and computer servers were not yet available in the LGUs because most of the processes are done offline. Also, most of the LGUs do not have an IT Office and they lack maintenance team and IT personnel. There were very few policies crafted to promote the use of ICT in local governance and there was lack of partnership with private agencies for e-government projects and activities. Recognizing the importance of ICT in terms of efficiency and transparency in local government services, the LGUs may consider the following success factors for e-government adoption:

Technological Factors

ICT strategic plan and ICT infrastructure coupled with sufficient funding play an important role in successful e-government adoption at the local level. LGUs need to come up with a strategic plan for the development and implementation of information systems. Fitriani et al. (2016) identified the development of an overall vision and strategy as one of the factors associated with successful e-government implementation. Local governments also need to consider allocating budgets for the implementation of the identified e-government projects. Funding is the factor that promotes the success of e-government (Khan, 2014). More importantly, the software, hardware, internet connectivity, and data security must be looked into for successful e-government adoption. According to Baeuo et. al (2017), the successful implementation of e-government relies on assessing the readiness of technical aspects such as software, hardware, internet, communication, operations, security, and others in order to realize the benefits of e-government.

Organizational Factors

Leadership and skilled human resources are also success factors for e-government adoption. LGUs need to have an IT expert that will take the lead in realizing the e-government programs. Leadership is one of the important factors for e-government success (Khan, 2014). An IT office manned by a competent and strong leader could spearhead ICT developments in the LGU. Ke and Wei (2004) affirmed that strong leadership with vision is a crucial factor for e-government success. In addition, LGUs need to have IT skilled employees that can help in the development and implementation of e-government projects. According to Manoharan & Ingrams (2018), many

local governments are facing a shortage of employees with relevant IT skills. Thus, there is also a need to provide an avenue where all employees can attend seminars/training to further develop their knowledge and skills in IT.

Environmental Factors

The support of local officials through ICT policies and legislations and the collaboration among government and private agencies are considered significant success factors for e-government adoption. LGUs need to develop and implement policies to promote ICT utilization while ensuring computer and data security. Also, a partnership among local public administrators can enhance effective resource allocation in diffusing e-government (Ferro & Sorrentino, 2010). Similarly, private agencies are also factors in successful e-government adoption. According to Moatshe (2014), the lack of public-private partnership was one of the barriers to e-government projects. Thus, LGUs may also consider building partnerships with private sectors for e-government and collaborate with the academe sector for e-government.

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