

The Effect of Seaweed Aquaculture Cooperatives on Sustainable Livelihoods in Malaysia

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Have you ever notice?



Colgate®

Fluoride Toothpaste

NET WT 2.8 OZ (79 g)

Mint Zing Paste
SPARKLING WHITE®
with Baking Soda & Peroxide
WHITENS & PROTECTS TEETH FROM STAINS

Fluoride Toothpaste
SPARKLING®
WHITE Mint Zing

Active Ingredient

Sodium monofluorophosphate 0.76% (0.14% w/v fluoride ion)

Use helps protect against cavities

Purpose

Anticavity

Warnings Keep out of reach of children under 6 years of age.

If more than used for brushing is accidentally swallowed, get medical help or contact a Poison Control Center right away.

Directions

- Adults and children 2 years of age and older: Brush teeth thoroughly, preferably after each meal or at least twice a day, or as directed by a dentist or physician.
- Children 2 to 6 years: Use only a pea sized amount and supervise child's brushing and rinsing (to minimize swallowing).
- Children under 2 years: Ask a dentist or physician.

Inactive Ingredients glycerin, hydrated silica, water, sodium bicarbonate, PEG-12, sodium lauryl sulfate, flavor, sodium hydroxide, cellulose gum, carrageenan, sodium-saccharin, calcium peroxide, titanium dioxide, FD&C green no. 3

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Ingredients:
 Turkey, Chicken, Chicken Broth, Brown Rice, Potato, Carrot, Herring, Natural Flavor, Whole Egg, Guar Gum, Apple, Alfalfa Sprouts, Cottage Cheese, Herring Oil, Carrageenan, L-ascorbyl-2-polyphosphate (Source of Vitamin C), Minerals (Iron Amino Acid Chelate, Zinc Amino Acid Chelate, Cobalt Amino Acid Chelate, Copper Amino Acid Chelate, Manganese Amino Acid Chelate, Selenium Yeast, Potassium Iodide), Potassium Chloride, Vitamins (Vitamin E, A, B12, D3 Supplements, Thiamine Mononitrate, Biotin, Riboflavin Supplement), Sunflower Oil, Pumpkin, Sodium Phosphate, Inulin, Salt, Choline Chloride, Beta Carotene

Guaranteed Analysis:

Protein (Min)	9.0%	Calorie Content
Fat (Min)	8.5%	(Metabolizable)
Fiber (Max)	1.5%	

Introduction

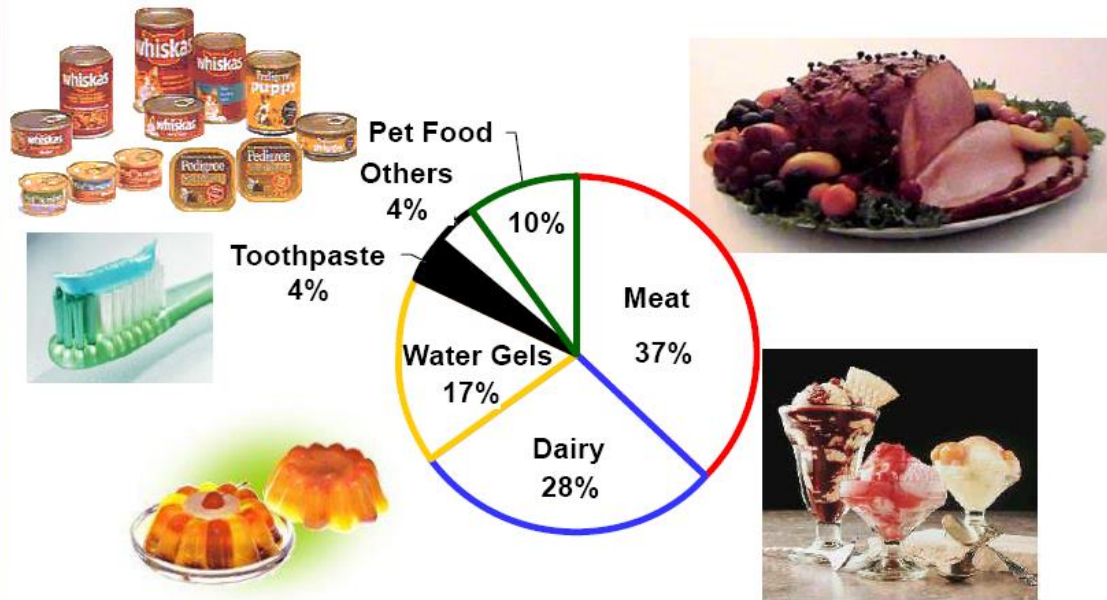
- First empirical study on the effectiveness of a seaweed aquaculture cooperative initiative – the ‘Seaweed Cluster Project’ (SCP), focusing on the sustainability of seaweed commercialisation and livelihood impacts



Carrageenan seaweed value chain

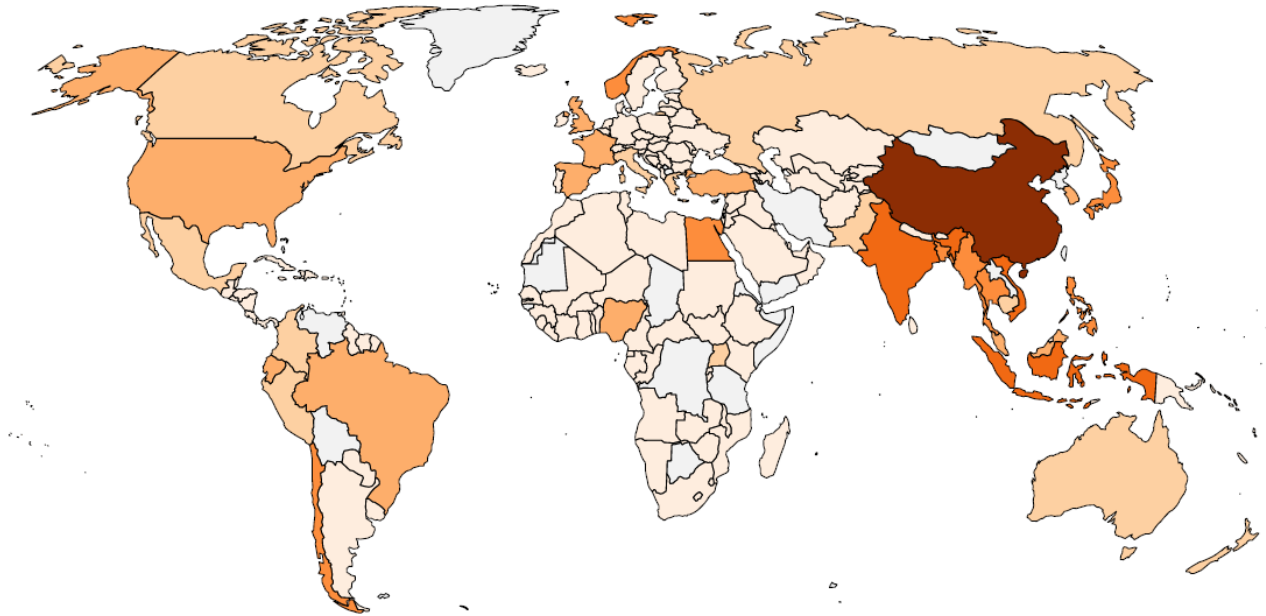


Carrageenan market share % by application as of 2009 – meat applications growing



Data source: Bixler, H. J. & Hans Porse, 2010, A Decade of Change in the Seaweed Hydrocolloids Industry. Paper presented at XX ISS in Mexico.

Global aquaculture production highlighting regional context for case-study



Percentage of global aquaculture production 2010–2012



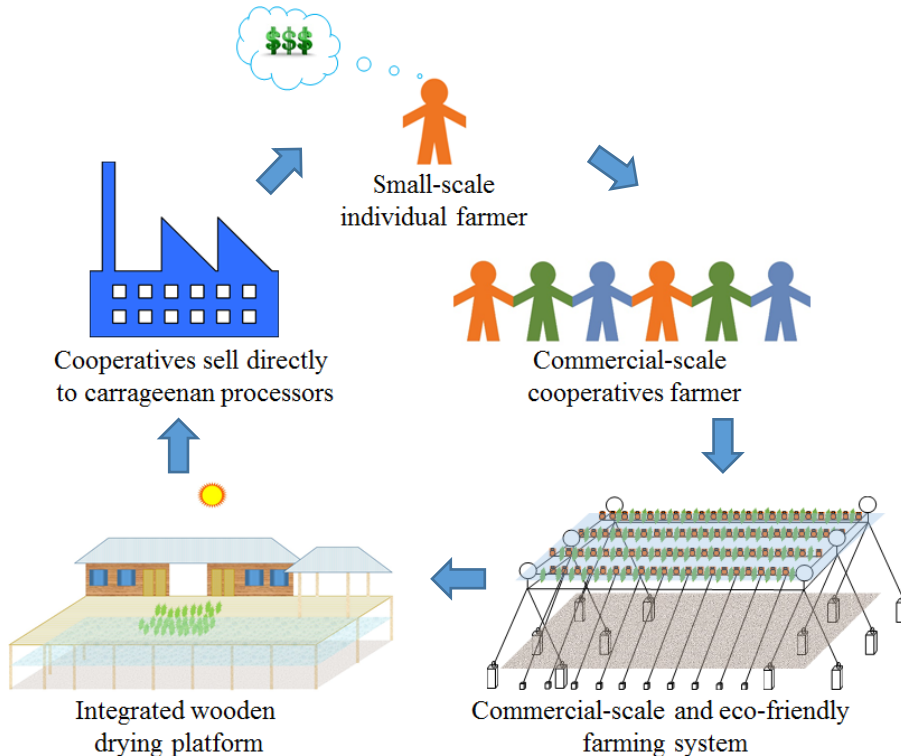
**Asia: 88.7%; Americas: 4.5%; Europe: 4.3%;
Africa: 2.2%; Oceania: 0.3%**

Case-study Rationale for Country

- Total people involved with aquaculture in the world: 19.3 million or 32% of 59.6 million fishers in 2016
 - 80% of aquaculturists in the world are considered small scale (FAO, 2018)
- Seaweed farming in Malaysia is a small scale aquaculture (SSA) sector (Nor et al., 2016; Sade et al., 2006)
- SSA seaweed farming issues in Malaysia (in relation to Sustainable Development Goals) – poverty, environmental sustainability, low productivity & quality



Case-study Rationale for the Seaweed Cluster Project (SCP)

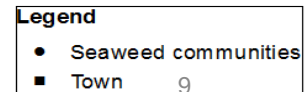
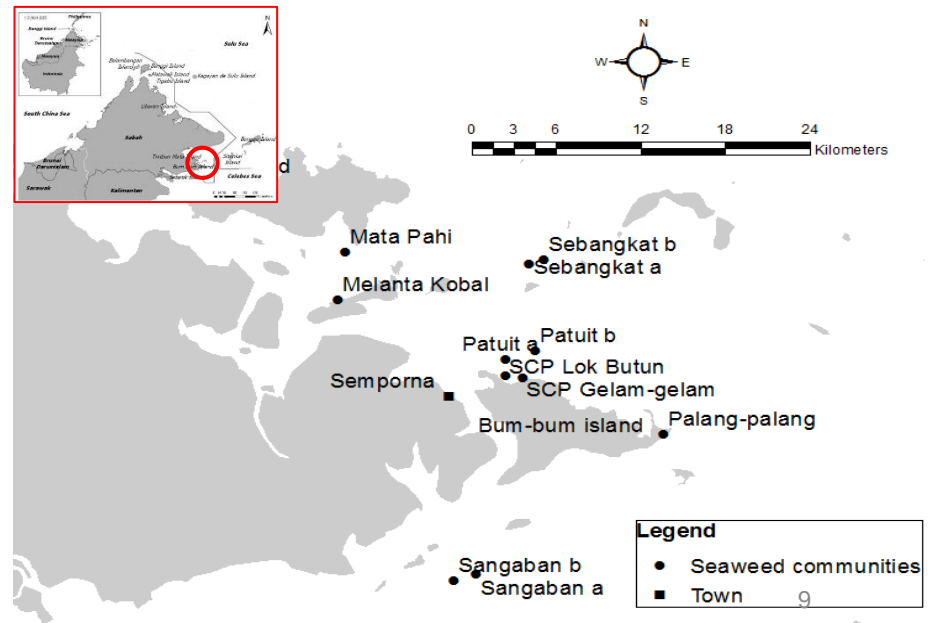


Study sites

- Semporna, Sabah: major producing area (80%)
- SCP: Two sites
 - Lok Butun & Gelam-gelam
- Non-SCP: Five sites
 - Palang-palang, Sebangkat, Patuit, Sangaban, Melanta Kobal

SCP – National Agrofood Policy (2011 – 2020)

- Ensure food security and safety
- Increase competitiveness and sustainability
- Increase the income level

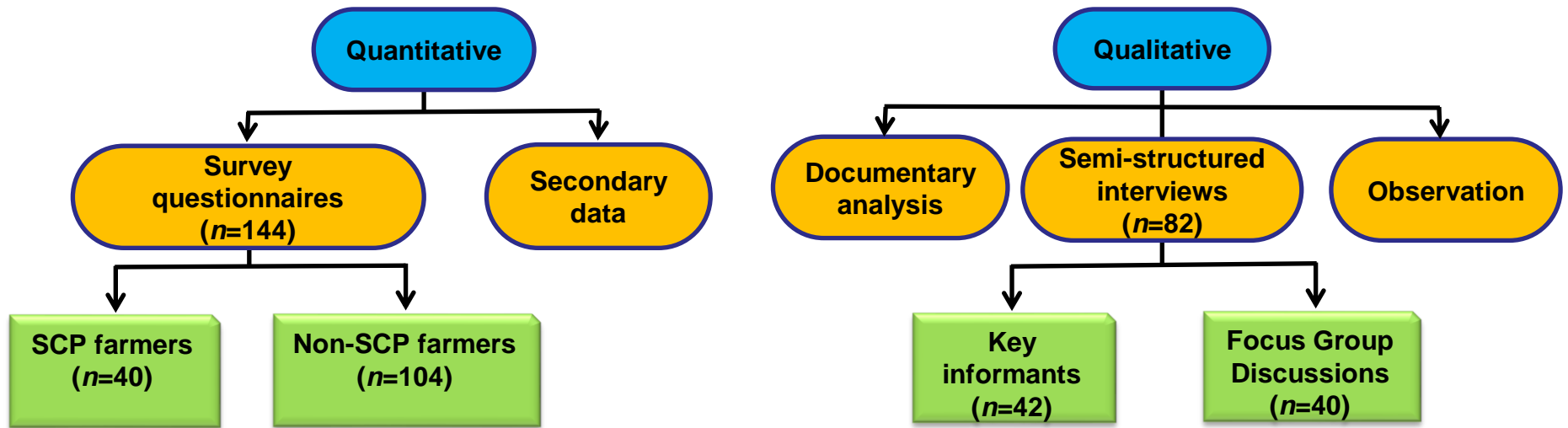


Research aim

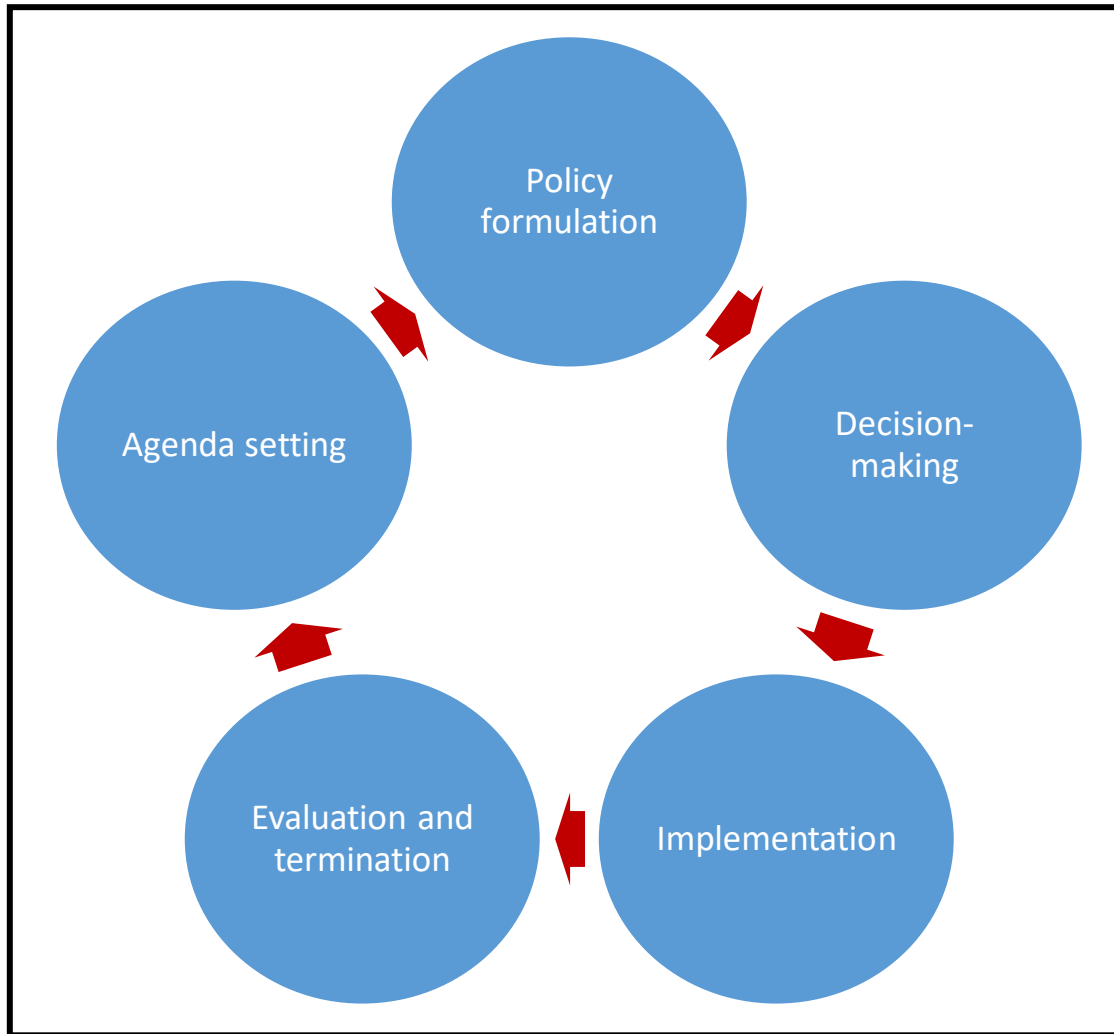
To evaluate the effectiveness of the SCP in delivering sustainable development and improving people's livelihoods by alleviating poverty, increasing farming efficiency and productivity, and improving seaweed quality and environmental conditions.



Methods



Main results - Policy cycle framework (PCF)

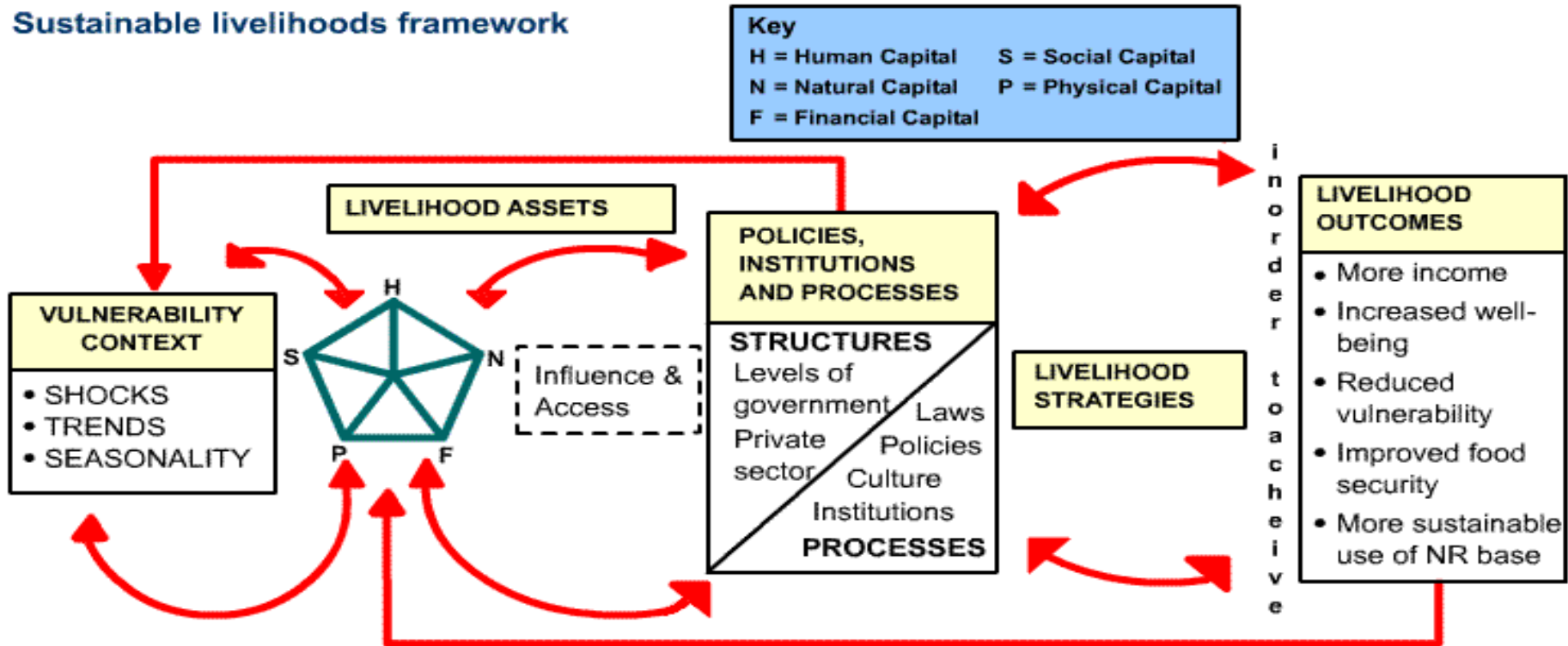


Fischer and Miller (2006)

- PCF – Seaweed Intervention Programmes (SIP)
- Poor analysis and inclusiveness
- Committee – report spending and official event only
- Lack of coordination and integration
- Poor monitoring and evaluation
- Poor data and information

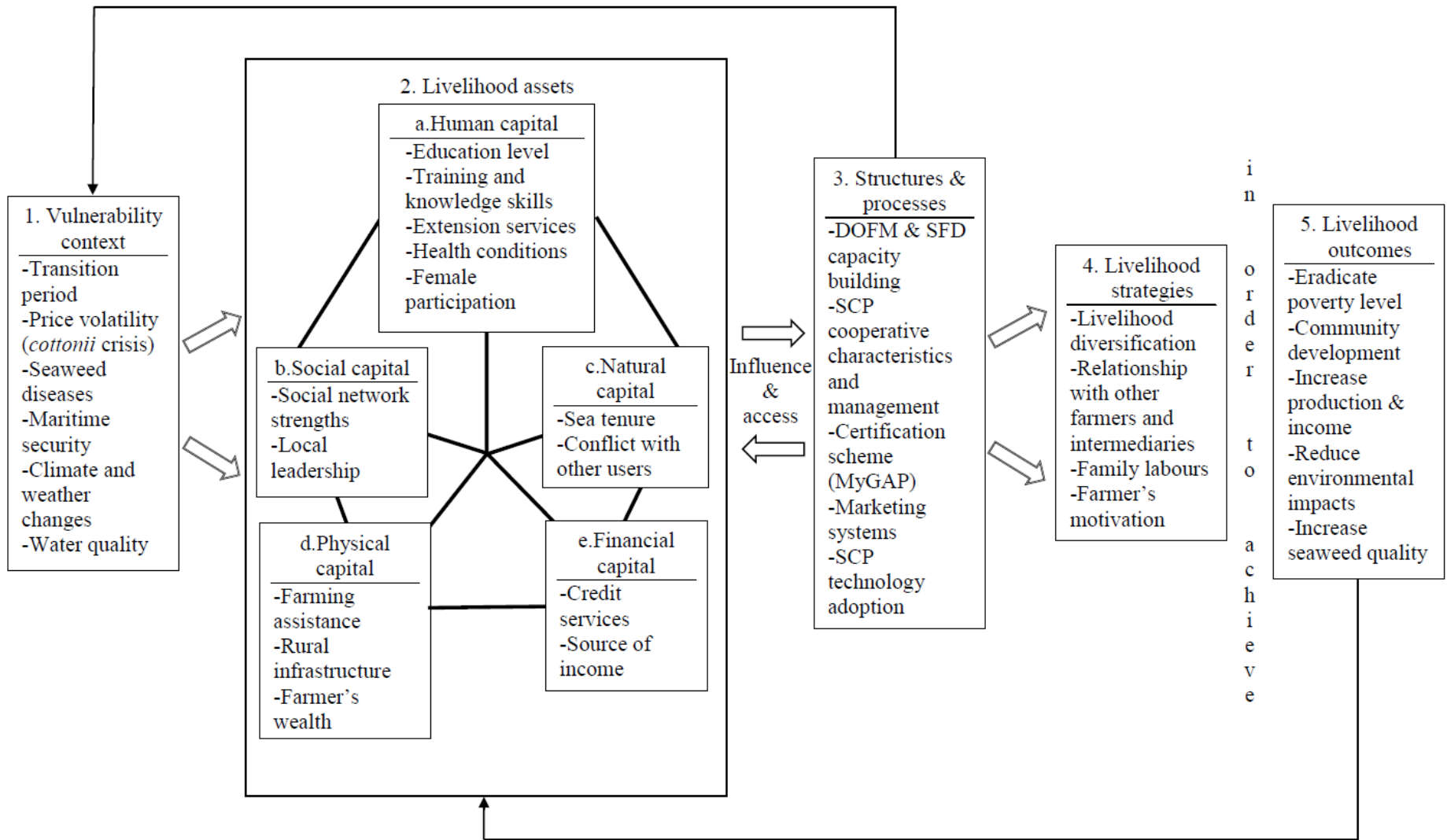
Sustainable Livelihoods Framework (SLF)

Sustainable livelihoods framework



DFID (2001)

Main results - SCP SLF



Main results – Ranking of innovation introduced in terms of participants' appraisal

1: Eco-Friendly Long line (EFL)



2: Certification scheme
3: Drying platform



4: Boats
5: Seedlings table
6: Cement anchoring system



Innovations	Rating
Polyfloat EFL	1 st
Detachable EFL	2 nd
Certification scheme	3 rd
Boats	4 th
Cement anchoring system	5 th
Drying platform	6 th
Tie-tie polyethylene EFL	7 th
Seedling table	8 th

Overall results based on research questions

What are the main barriers to maximising the potential growth of the seaweed industry in Malaysia?

A. Governance

- 1) Institutional capability
- 2) Capacity building
- 3) Maritime security
- 4) Migrant farmers
- 5) Sea tenure

B. Economics

- 6) Price volatility
- 7) Seaweed quality
- 8) Intermediaries

C. Environmental and technological

- 9) Technology

D. Sociocultural

- 10) Indigenous' lack of interest
- 11) Social capital
- 12) Local leadership
- 13) Gender

How does the SCP set out to overcome these barriers, and what is the likelihood of success?

Increase farmers' income above poverty level (SDG1)

- 87.5% of **SCP farmers** earned **less than** US\$10 per day per farmer.
- 56.7% of **non-SCP** farmers earned **more than** US\$10 per day per farmer.
- Jobs multiplicity increased daily income to **more than** US\$10 per SCP farmer (55%).

Improve farming efficiency and productivity (SDG12)

- 90% of **SCP farmers** produced **less than** 1 mt per ha per year.
- 96.2% of **non-SCP** farmers produced **more than** 1 mt per ha per year.
- Absence of Local Ecological Knowledge (LEK) in developing farming technology.

Increase competitiveness and safety [good seaweed quality] (SDG12)

- Unable to replace the intermediaries' role in providing services.
- Weak market mechanisms.

Environmental sustainability (SDG14)

- Seasonality, diseases and predation issues.
- Seaweed Aquaculture Industry Zone (SAIZ) was poorly implemented in the marine spatial planning process.

Main Conclusions

This study determined that the establishment of seaweed aquaculture cooperatives – SCP – could meet their central objectives to some extent; however, the critical features of effective governance, market mechanisms, sustainable marine development, acceptable technology, and sustainable livelihoods approaches were often poor or lacking.

Recommendations

- Increase the participation of indigenous people in the SCP;
- Confer legal status upon the existing migrant farmers;
- Need to strengthen seaweed aquaculture cooperative organisations;
- Provide entrepreneurship skills to enhance profits; and,
- Promote stakeholder engagement to influence decision-making.

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Achievements



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MAST PGR Conference 2016

The 2016 Newcastle University MAST PGR Conference provided a forum for the presentation, discussion and dissemination of the work of our postgraduate research students. It provided an environment for students to present their research, answer questions and receive feedback from other students and scholars from a broad range of fields in the study of Marine Science and Technology at Newcastle University.

To reflect the diverse range of topics that our students research, there is no specific conference theme. Instead, the conference will present a range of papers within the overarching field of Marine Science and Technology. Presentations will either be in the form of a specific paper, research findings from the thesis, discussing of a thesis chapter, or an introduction to a broad theoretical framework and methodology.

Prizes were awarded to students from each stage of study for Best Presentation, as well as a Best Published Paper prize (accepted for a journal paper or international conference) being awarded to one student from each of Marine Science and Marine Technology.

Postgraduate Conference 2016 prize winners are:

Marine Technology:

Best Stage 1 Presentation – Arlene Arias Coronado
Best Stage 2 Presentation – Alessandro Carchen
Best Stage 3 Presentation – Sudheesh Ramadasan
Honorary Mention – Federico Prini
Best Published Paper Prize – Weichao Shi

Marine Science:

Best Stage 1 Presentation – Emily Paige O'Hara
Best Stage 2 Presentation – Andrew Temple
Best Stage 3 Presentation – Paula Lightfoot
Honorary Mention 1 – Georgina Robinson
Honorary Mention 2 - Adibi Rahiman Bin Md Nor
Honorary Mention 3 – Bitu Sabbaghzadeh
Best Published Paper Prize – Georgina Robinson

Achievements (cont'd)

- British Psychological Society Student Bursary Award (2017)
- The Paul C. Silva Student Grants Award (2017)
- One ISI & Scopus Index (2016) + one coming soon (2019)
- Four international oral presentation (2017 – 2019)
- Two posters presentation (2016)
- Reviewer for Journal of Southeast Asian Studies, University of Malaya (2018)

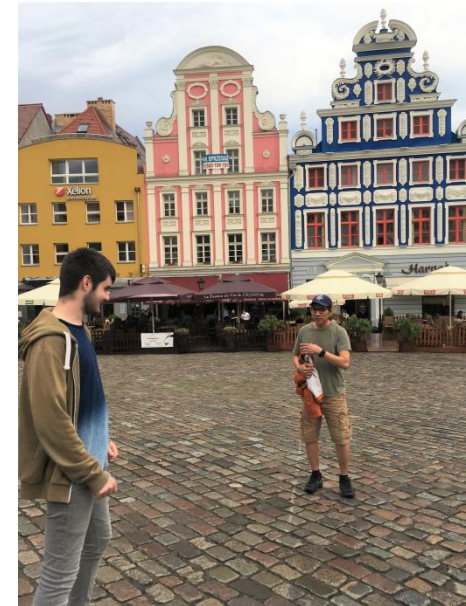
PhD @campus life



PhD @academic life



PhD @social life



PhD @family life



Our last day in Ncl ☹️



Post PhD life

- Senior Lecturer @the International Institute of Public Policy & Management, UM
- Early Career Researchers (ECR) for the Global Seaweed Star research grant amounted to £6 mil from 2019 until 2021
- Ncl alumni gathering

UK Research and Innovation



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Acknowledgements

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Thank you for listening



Any questions?