INTEGRATING SUSTAINABILITY FACTOR INTO UNIVERSITY-BASED AGRICULTURE EXTENSION SERVICES: A CASE STUDY FROM INDONESIA

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OUTLINE

1. Introduction.
2. Perspective.
3. Key points related to sustainability science.
4. Agriculture extension in Indonesia:Roles of universities and issues.
5. Integrating sustainability factor into university-based agriculture extension (Focus on integrating livelihood improvement and rehabilitation of degraded land and forest).
6. Conclusion.

INTRODUCTION

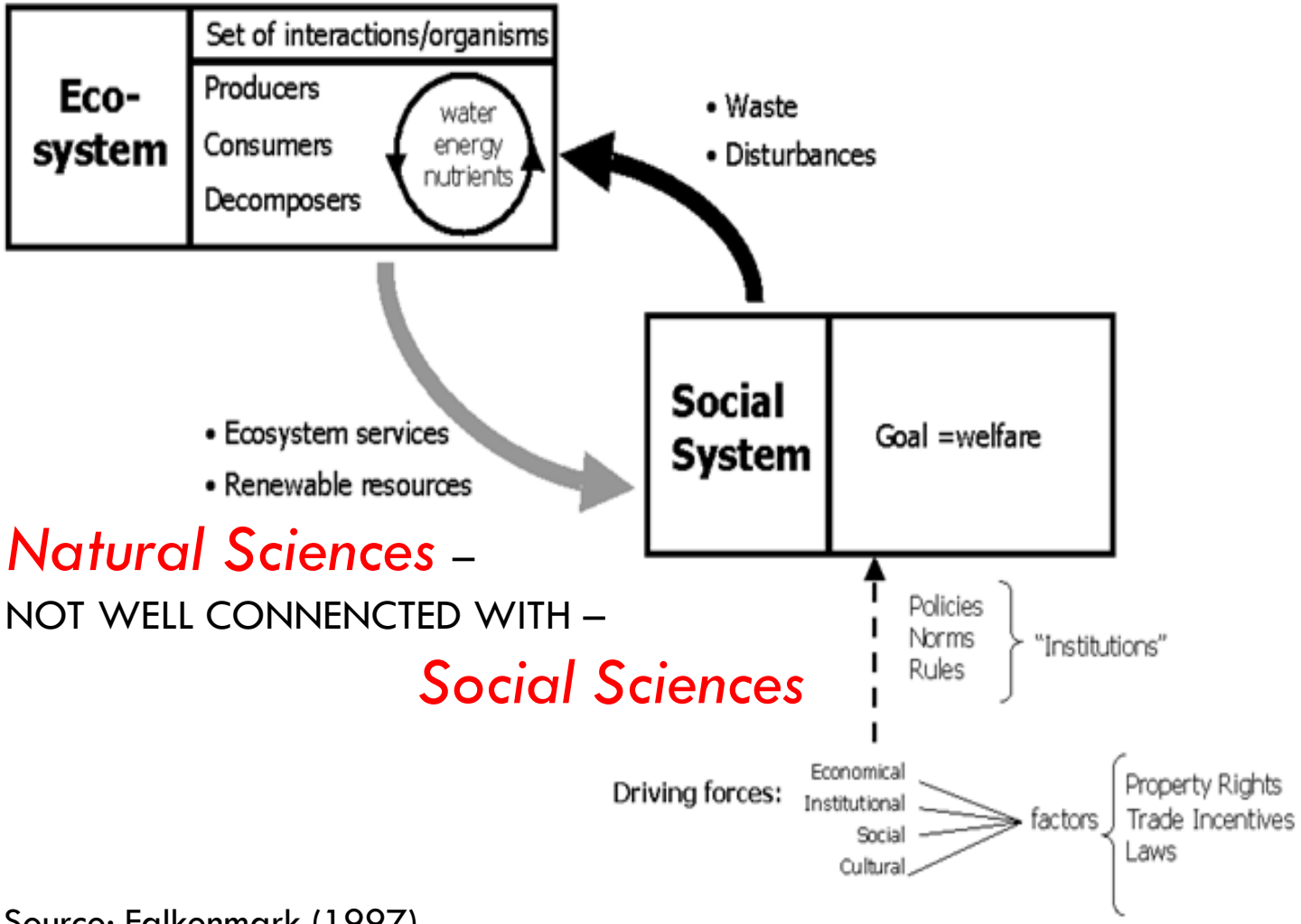
1. In Indonesia, universities is one of the major actors in agricultural extension → related to three tasks: (agriculture) education, research and development, and community engagement.
2. Historically, universities have a significant role in agriculture development in Indonesia, among others in implementation of rice intensification program started in 1970s.
3. Evolution → The government continue to provide supports for development and application of technologies and innovation in the context of community development to foster impact of science on society.
4. However, the results in term of sustainability of benefits were mix, some were achieving promising results but some were stop short of expectation → there is a need to look into the sustainability factor in the university-based agriculture extension in Indonesia.

Post 2015-Sustainable Development Goals (*SDGs*)

SUSTAINABLE AGRICULTURE AS ONE OF PRIORITY GLOBAL AGENDA IN SDGs

- **Goal 1. End poverty in all its forms everywhere.**
- **Goal 2.** End hunger, achieve food security and improved nutrition and **promote sustainable agriculture.**
- Goal 3. Ensure healthy lives and promote well-being for all at all ages.
- Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
- Goal 5. Achieve gender equality and empower all women and girls.
- Goal 6. Ensure availability **and sustainable management of water and sanitation** for all.
- Goal 7. Ensure access to **affordable, reliable, sustainable and modern energy** for all.
- Goal 8. Promote **sustained, inclusive and sustainable economic growth, full and productive employment and decent work** for all.
- Goal 9. Build resilient infrastructure, promote inclusive and **sustainable industrialization and foster innovation.**
- Goal 10. Reduce inequality within and among countries.
- Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable.
- Goal 12. Ensure **sustainable consumption and production patterns.**
- Goal 13. Take urgent action to **combat climate change and its impacts.***
- Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
- **Goal 15**. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and **halt and reverse land degradation** and halt biodiversity loss.
- Goal 16. Promote **peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.**
- Goal 17. Strengthen the means of implementation and revitalize the global partnership for sustainable development.

KNOWLEDGE AND INNOVATION GENERATION: *PERSPECTIVE, REVIEW OF CURRENT PRACTICES AND THE NEED FOR SUSTAINABILITY SCIENCE.*



Natural Sciences –

NOT WELL CONNENCTED WITH –

Social Sciences

Source: Falkenmark (1997).

- Physics, chemistry, biology and the environmental sciences can deliver wonderful solutions to some of the challenges facing individuals and societies, but whether those solutions will gain traction depends on factors beyond their discoverers' ken. ***If social , economic and/or cultural factors are not included in the framing of the questions, a great deal of creativity can be wasted*** (p.5).

- If you want science to deliver for society, through commerce, government or philanthropy, you need to support a capacity to understand that society that is as deep as your capacity to understand the science (p.5).

- The need to establish multidisciplinary projects – and ***integrate natural sciences, social sciences and humanities from the outset.***

Source: Nature, Journal of Science, Vol 517, 1 January 2015

KEY POINTS RELATED TO SUSTAINABILITY SCIENCE --- 1

First, ***un-sustainability partly caused by the divided domain of natural and social sciences*** and increasingly fragmented disciplines and tended to be un-connected each other and become less relevant to help addressing the complex problems of sustainability (Spangenberg, 2002; Komiyama and Takeuchi, 2006; Benneth, 2013).

Second, the aim of sustainability science is ***to formulate science-based innovative solutions to the sustainability problems*** → related to interface between nature and society, an interdisciplinary arena to satisfy society's need within the limit of nature carrying capacity (Bennet, 2013).

Third, there is a ***need for participatory approach in dealing with sustainability problems***, not only by scientists (from both natural and social sciences), but involving affected society/community, practitioners from government, and related stakeholders to solve the problems (Miller, Wiek, Sarewitz, Robinson, Olsson, Kriebel, and Loorbach, 2014).

KEY POINTS RELATED TO SUSTAINABILITY SCIENCE --- 2

Sustainability science "is an ***attempt to bridge the natural an social sciences for seeking creative solutions*** to the complex problems" (Jerneck, Olsson, Ness, Anderberg, Baier, Clark, Hickler, Hornborg, Kronsell, Lovbrand, and Person, 2011: 69).

The ***objectives*** of sustainability science are: "(a) understanding the fundamental interaction between nature and society; (b) guiding these interactions along sustainable trajectories; and (3) promoting social learning necessary to navigate the transition to sustainability" (Miller, Wiek, Sarewitz, Robinson, Olsson, Kriebel, and Loorbach, 2014: 239).

→ Sustainability science ***required a new approach in setting the boundary of analysis, assessing the impact of the interface between society and nature, formulating innovative solutions and its implementation***. Therefore, the ***co-production of knowledge***, reciprocal learning, and the applied aspects of science are very important in this context (Spangenberg, 2002; Benneth, 2013).

AGRICULTURE EXTENSION IN INDONESIA:
FRAMEWORK, ROLES OF UNIVERSITY AND ISSUES --- 1

Law 16/2006 on agriculture extension system → change the landscape of agriculture extension in Indonesia:

Three types of agriculture extension service provisions:

> by government agencies, bureaucratically driven; tended to be office-based planning; and sectoral/partial approach;

> by private sectorrelated to marketing of companies products such as; extension workers assigned by the companies with target on sales; almost no (or very limited) formal coordination with local government's agriculture/extension agencies (provincial/district/sub-district); and build demonstration plots as part of product promotion;

> by self-help or voluntary by farmers organization, having limited resources to support their activities, and civil society (NGOs) which usually working with farmers organization, project based and involvement has time limitation.

AGRICULTURE EXTENSION IN INDONESIA:
FRAMEWORK, ROLES OF UNIVERSITY AND ISSUES --- 2

Overall agriculture extension approach characterized by: considering specific crop/product (no or less concern about multifunctionality of agriculture); less consideration on area/resources/clustering management (consider as separate task; limited synergy and concerted efforts among the extension actors.

University and its researcher, with its mandates, is a position to develop synergy and complimentin those other three agriculture extension services. University can contribute in co-production of technology and innovation generation, co-implementation of solutions for problems related to sustinable agriculture, co-sharing of resources with other extension actors. All aiming at solving the problems of sustainable agriculture faced by the farmers and the sector. However, this position was not yet well tried and applied in a wider scale.

A rapid assessment of the university-community engagement has been conducted at Andalas University. Rapid assessment was conducted in 45 university - community engagement activities in the last 2014 - 2016.

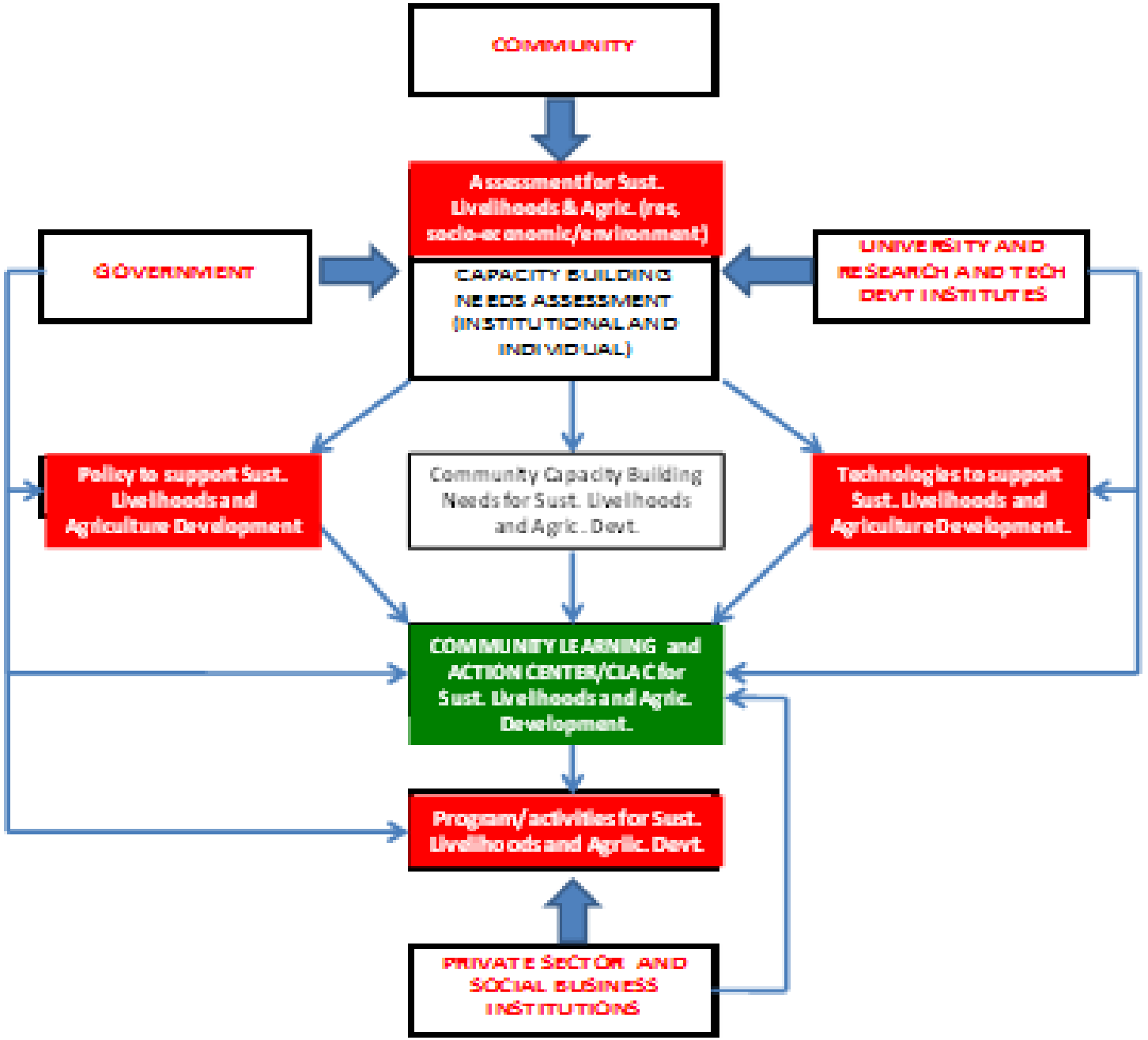
ITEMS OF ACTIVITY AND IMPLEMENTATION APPROACH OF UNIVERSITY - COMMUNITY ENGAGEMENT AT ANDALAS UNIVERSITY 2014 - 2016.

No.	Item of Activity	Implementation Approach	Percentage
1	Extension need assessment.	Using participatory approach in identifying problems and needs.	84.4%
		Researcher decision.	15.6%
2	Identification of solutions options.	Using participatory approach in formulating solution.	62.2%
		Researcher decision.	37.8%
3	Implementation strategy.	By researcher and team.	97.7%
		In synergy and partnership with other actors.	2.3%
4	Having component of local institution strengthening for managing continuation of activities.	Yes	13.3%
		No	86.7%

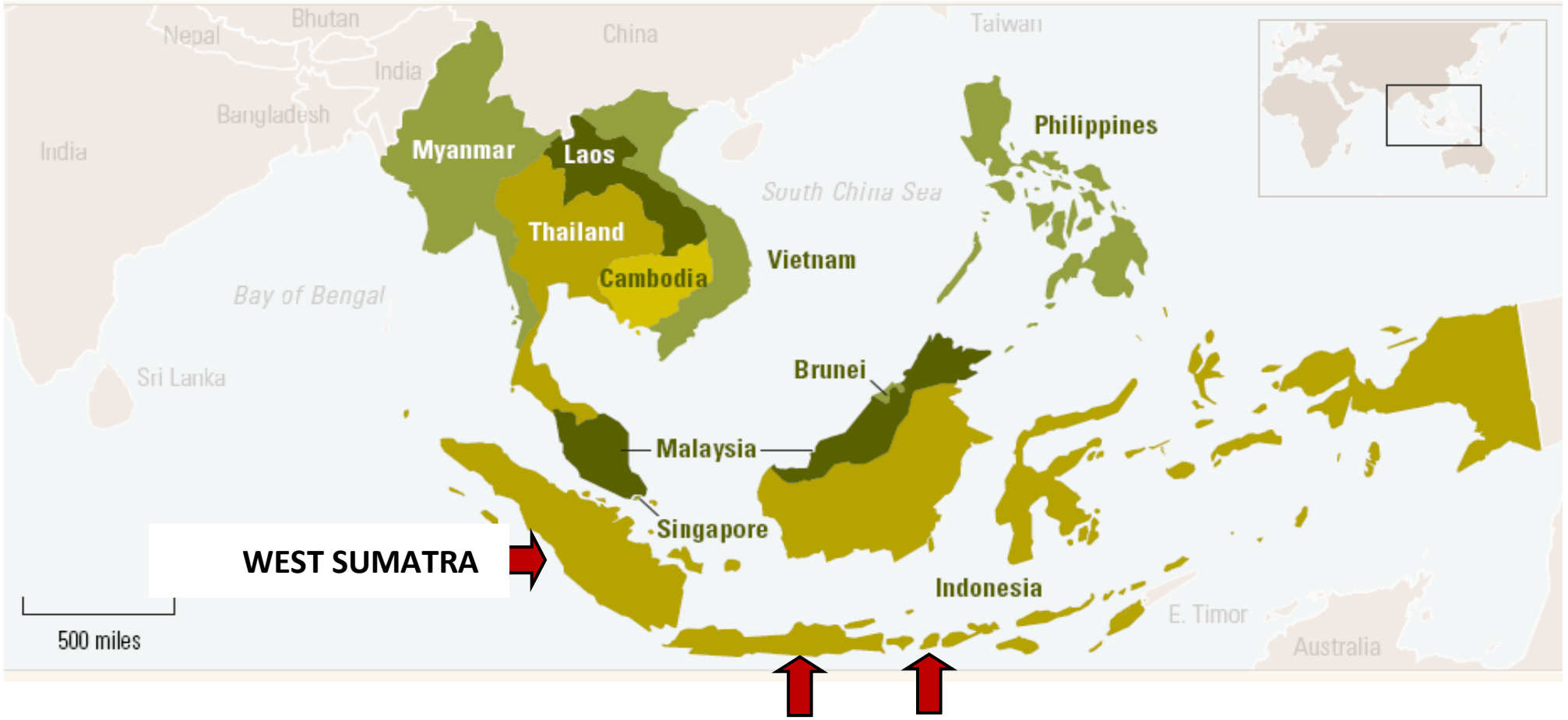
INTEGRATING SUSTAINABILITY FACTOR INTO UNIVERSITY-BASED AGRICULTURE EXTENSION:

AN EXPERIENCE FROM INDONESIA.

Focus → Integrating Livelihood Improvement and Rehabilitation of Degraded Lanad and Forest



Map 1: Research sites.



Note: ➡ Research site.

YOGYAKARTA

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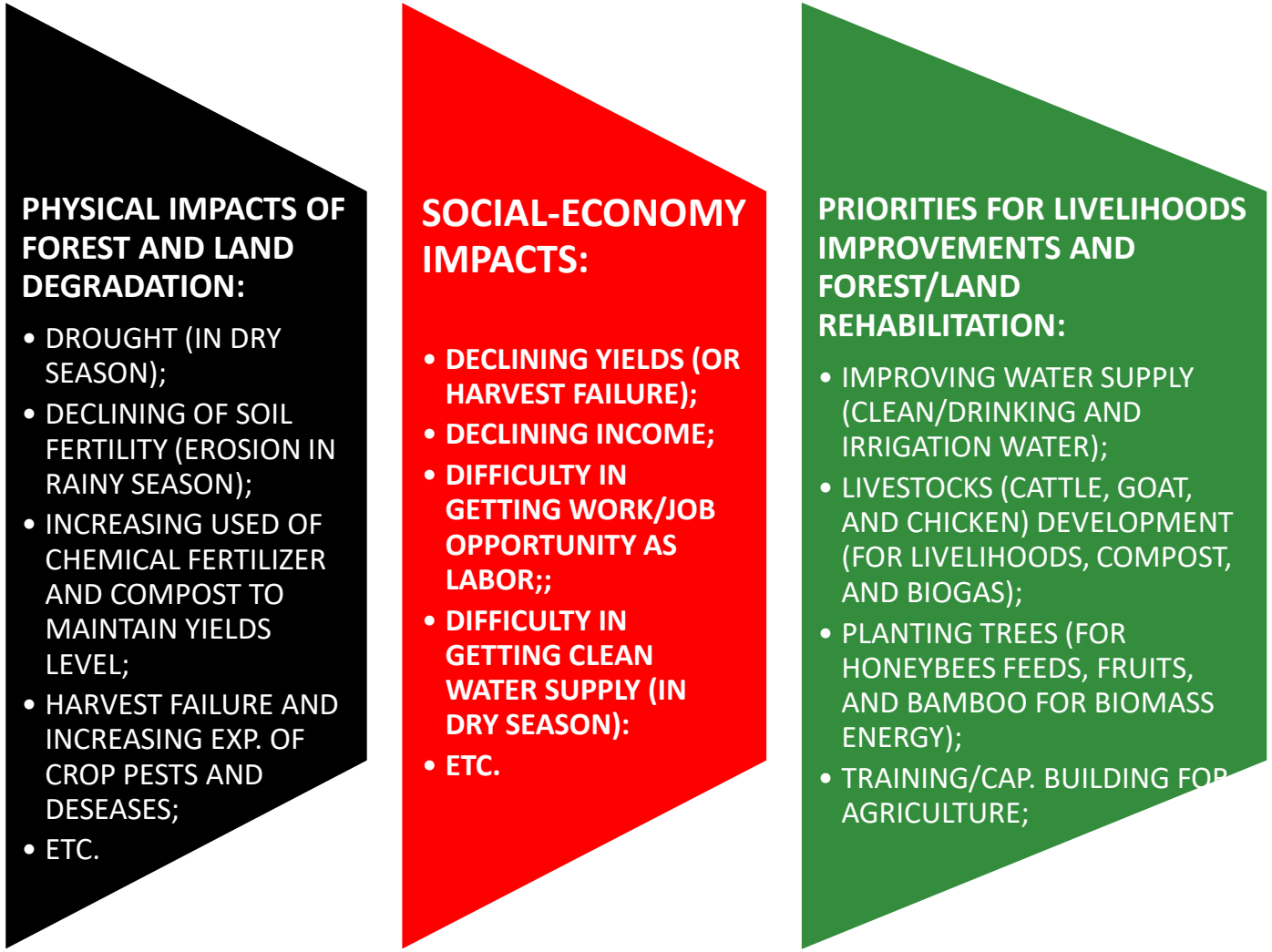
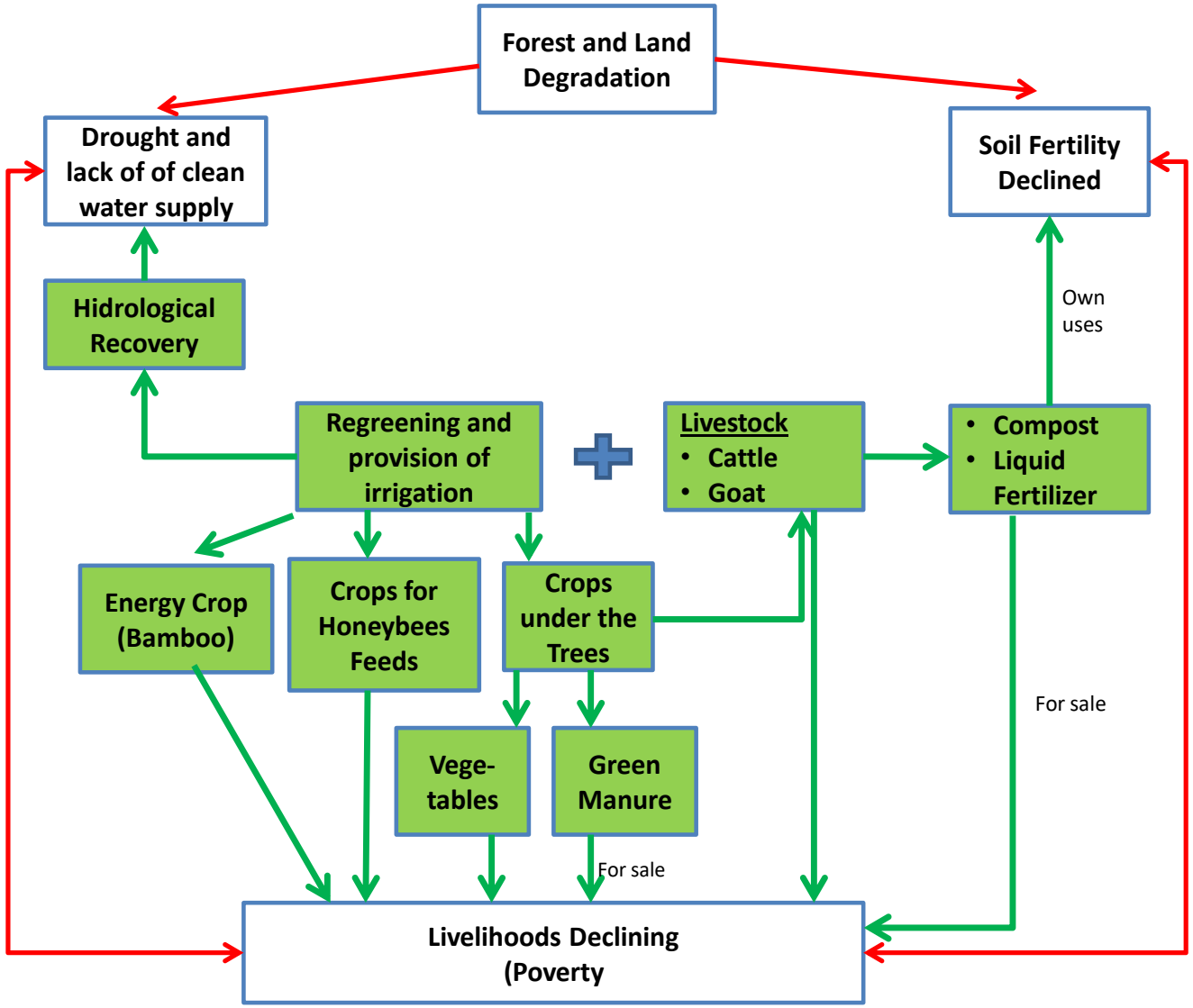
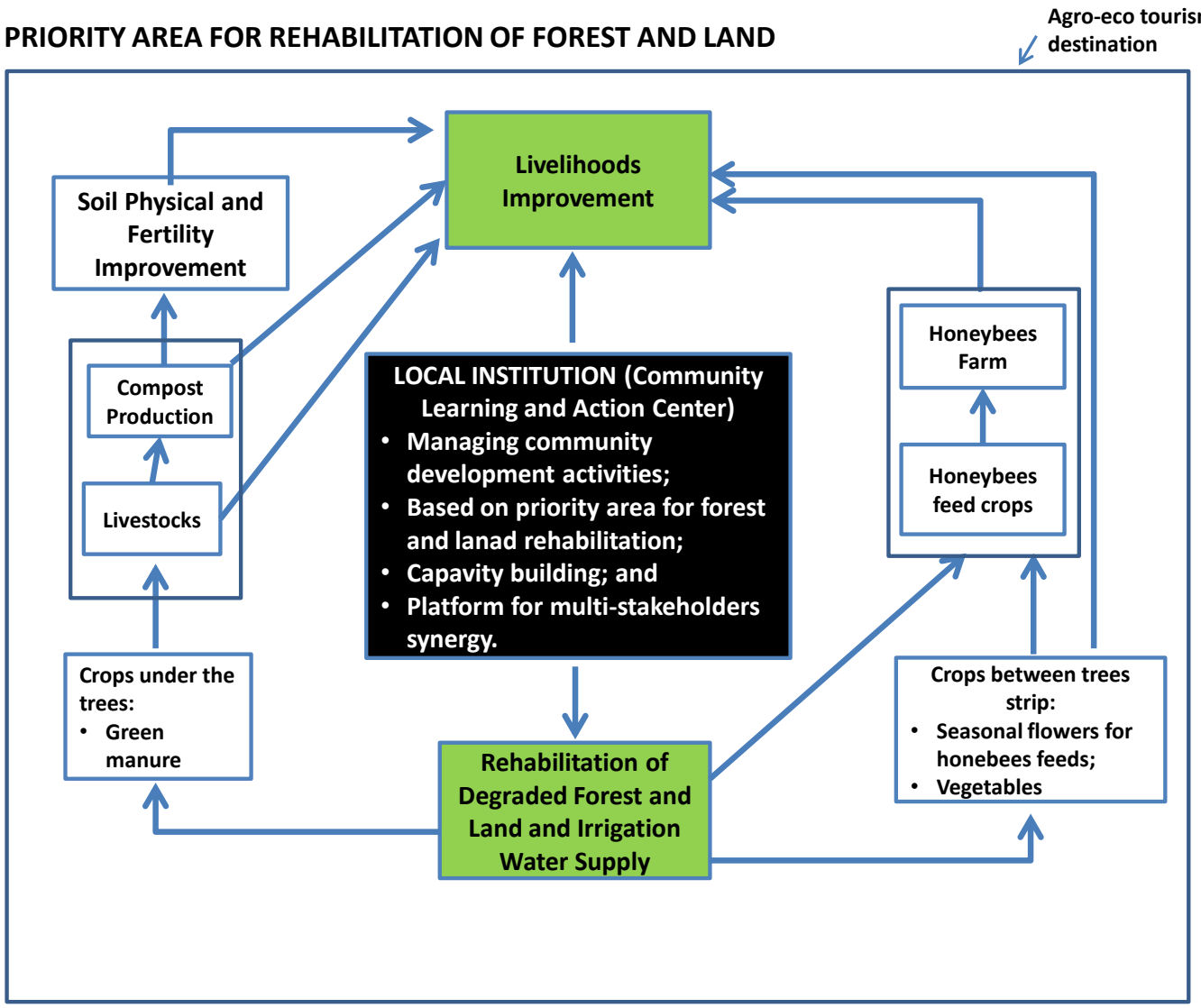
Physical and social impacts of DLD and associated priorities for integrated livelihood improvement and forest and land rehabilitation.



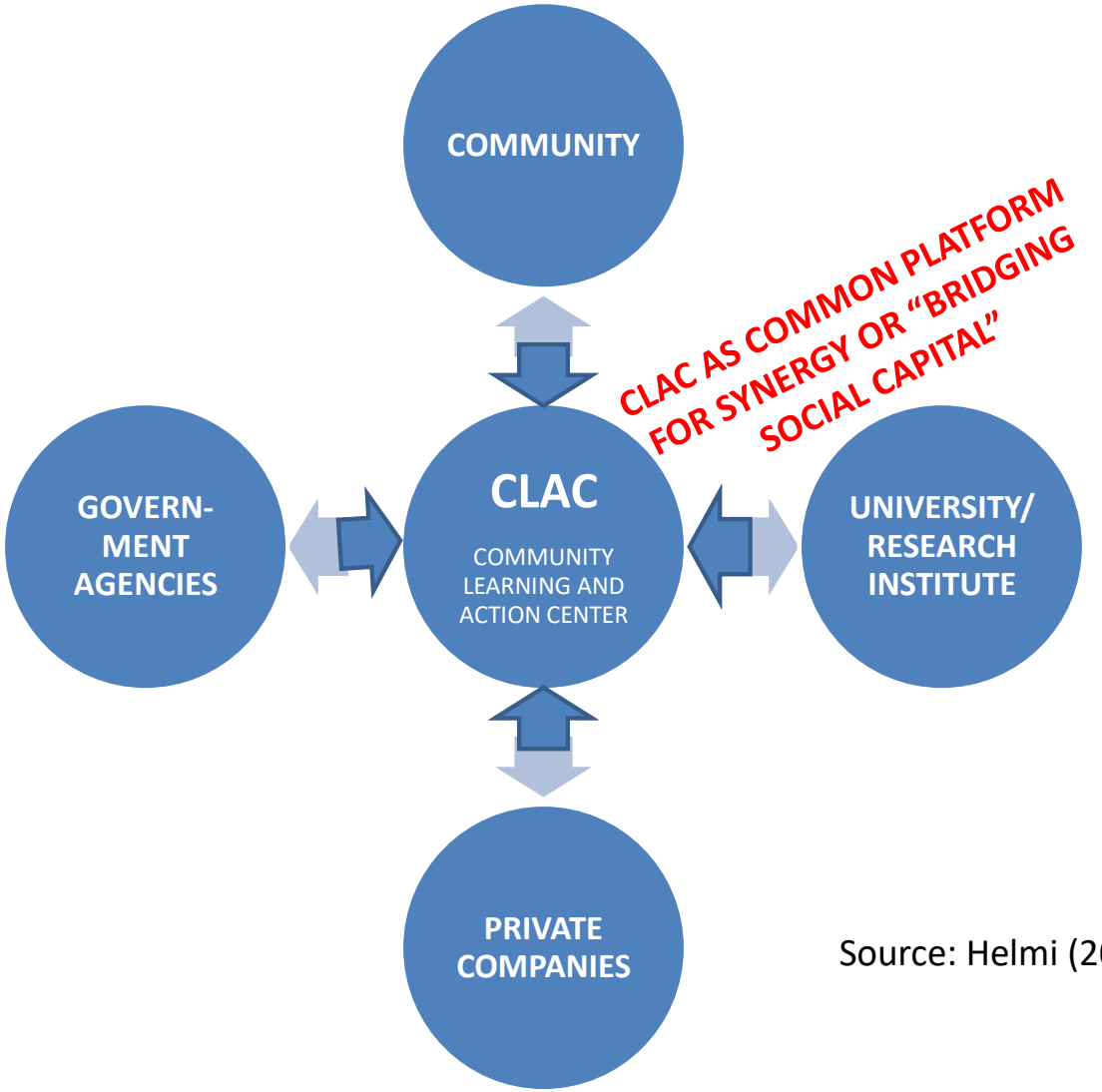
A model to integrate efforts for livelihoods improvement and rehabilitation of degraded forest and land.



A framework integrating livelihoods improvement and rehabilitation of degraded forest and land with local institution as the engine for social development.

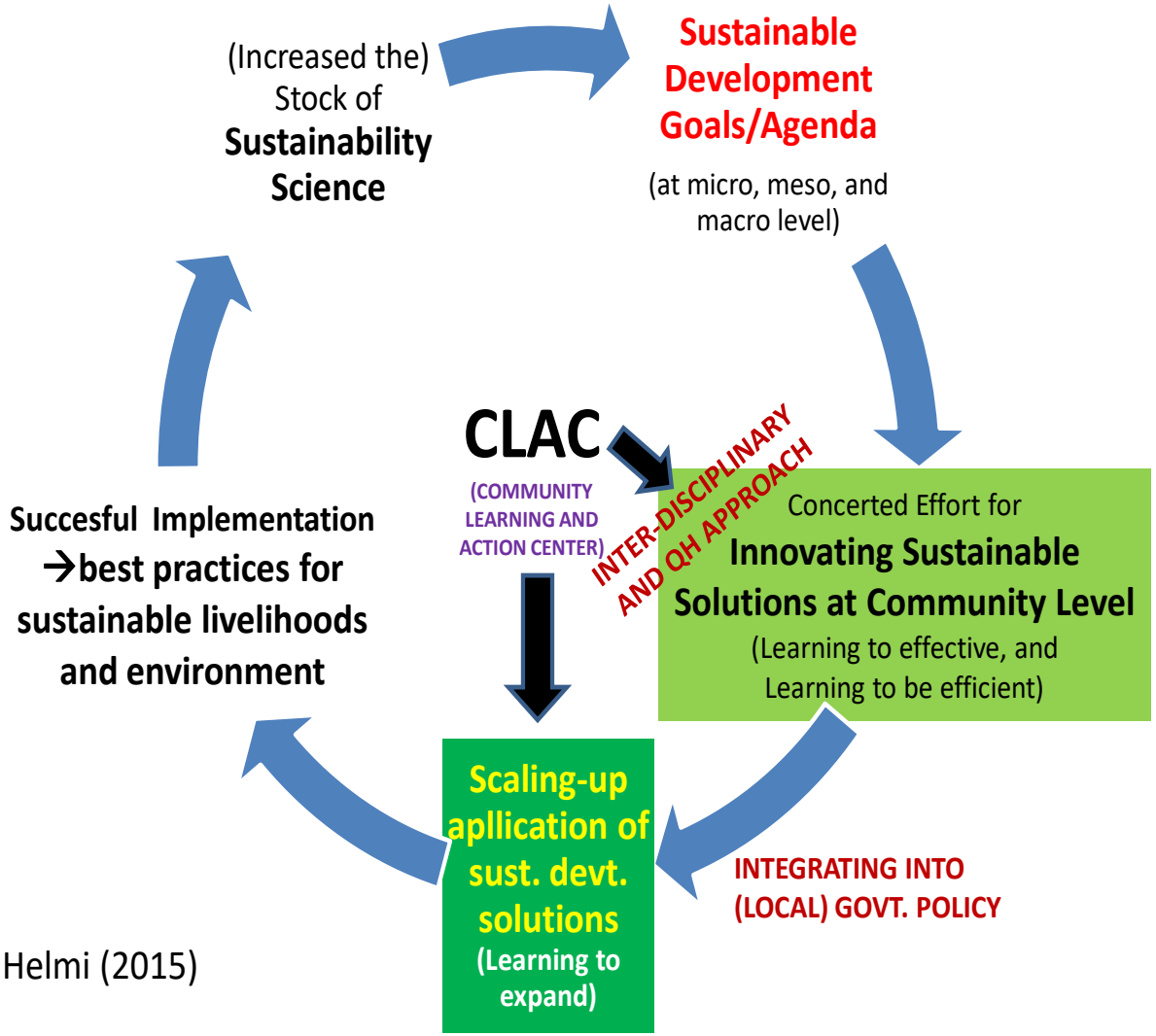


A model for quadruple helix sysnergy with CLAC as prime mover in integrating livelihood improvement and rehabilitation of degraded forest and land.



Source: Helmi (2015).

ROLES OF CLAC IN PRACTICING SUSTAINABILITY SCIENCE AT COMMUNITY LEVEL AND CONTRIBUTING TO ACHIEVEMENT OF SDGs



Source: Helmi (2015)

CONCLUSION: *KEY FACTORS CONTRIBUTE TO INTEGRATION OF SUSTAINABILITY FACTOR INTO UNIVERSITY-BASED EXTENSION*

First, is developed and implement a framework for synergy and partnership among major sustainable development actors in a Quadruple Helix Approach, and positioned university as the hub. Further, strengthening local institution as the prime mover at the field level for the integrated livelihood improvement and rehabilitation of degraded forest and land, and play roles as platform for the synergy and partnership.

Second, is stengthening integrated forest and land based livelihood improvement. The important factor here is livelihoods improvement activities are tailored with rehabilitation of forest and land. By doing so, activities on livelihood improvement would also enhance rehabilitation forest and land because one is required the other.

Third, is mobilizing facilitation and support from major stakeholders (in quadruple helix approach): government agencies (national and local through their programs/projects), private sector organizations (through corporate social responsibility/CSR), universities/research institute (through improving application of appropriate technologies and innovations), and the community themselves (local initiatives, participation, local resources mobilization). Mobilizing facilitation and support is framing in the form of local government policy guidelines for synergy in development.

Fourth, is support from international organizations committed to achievement sustainable development goals to support policy advocacy and piloting innovative model for integrating livelihood improvement and rehabilitation of degraded forest and land. In addition to that, is support to develop sustainability science and capacity to implement sustainable development solutions both at community level and government agencies.

THANK YOU