A Systematic Review on Community Forest Management in Southeast Asia: Current Practices and Impacts on Biodiversity Conservation and Livelihood Quality of Local Communities

Wahyu Diansyah, Azlan Abas and Zaini Sakawi
Center for Research in Development, Social and Environment (SEEDS), Faculty of Social Sciences and Humanities, Universiti Kebangsaan Malaysia, Selangor, Malaysia

Abstract

The failure of centralized forest management at conserving forests and their biodiversity has made a decentralized forest management approach such as community forest management (CFM) preferable in many parts of the world. In Southeast Asia, however, CFM is relatively new. The aim of this systematic review is to examine current studies of CFM in Southeast Asia pertaining to the impacts on biodiversity conservation and livelihood quality of local communities. The data for this research were taken from citation and scientific literature databases within the 2000–2020 timeframe. Results indicate that research studies on CFM and its impacts are increasing in Southeast Asia in terms of numbers, yet there is a lack of a common terminology throughout the region. This study suggests that knowledge exchange is made possible through CFM, which will empower local communities and increase their awareness of conservation values compatible with their traditional knowledge and their subsistence needs.

Keywords: biodiversity, community forest management, community well-being, forest ecosystem, local knowledge

Recommended citation (APA 7th ed.)

Diansyah, W., Abas, A., & Sakawi, Z. (2021). A systematic review on community forest management in Southeast Asia: Current practices and impacts on biodiversity conservation and livelihood quality of local communities. Human Ecology Review, 27(1), 3–21. doi.org/10.22459/HER.27.01.2021.01
1. Introduction

Many countries have nationalized the ownership and management of their forestland in the past, expecting to have more control over their natural resources for increased revenue and longer-term sustainability (Hoskins, 2007). However, such centralized management of forests has in fact led to the progressive increase of pressures on forest areas from economic and demographic demands that result in deforestation and severe forest degradation. It has also given rise to social conflicts over access to resources, where central governments have been unable to provide effective control over large areas of forests (Lonn et al., 2018). The mismanagement of forests that results in deforestation and forest degradation will not only threaten the forest and its biodiversity, but also threaten the lives of human beings, especially those living in close proximity to forests who are most dependent upon the forests.

The effectiveness of community forest management (CFM) in dealing with deforestation and improving local livelihoods has been evident in numerous studies, but it is important to note that forest areas around the world and their drivers of deforestation differ significantly from one setting to another. Studies that show successful CFM practices in a specific region might be geographically biased (Ota et al., 2020), and hence it might not be possible to draw generalized conclusions that such management practices would bear the same results across different geographical and sociopolitical conditions. Furthermore, as Arts and de Koning (2017) note, CFM practices still present mixed results. The diverse outcomes in various situations and landscapes need to be further studied to provide practitioners and researchers with a better understanding, leading to effective CFM practices with desired outcomes. Southeast Asian countries’ geographical proximity means that they have similar climatic conditions—all the countries of Southeast Asia, partially or wholly, lie in the path of monsoons, for example—and also have part of their history in common (Lim, 2001). In this shared context, this systematic literature review is intended to explore the dynamics of CFM studies in Southeast Asia, and highlight the trends and patterns relating to CFM’s impacts on biodiversity conservation and the livelihood quality of local communities in the region.

The main thrust of this systematic review is thus to present the current studies of CFM practices in Southeast Asia, and thereby identify the impacts of CFM on biodiversity conservation (which covers such aspects as avoided deforestation, forest cover, and biodiversity conservation awareness) and on the improvement of local livelihoods. Biodiversity conservation and local livelihoods are closely related because community management for forest utilization can be a strategy for forest and biodiversity conservation (Webb & Shivakoti, 2007). By identifying the trends, patterns, and knowledge gaps in the studies of CFM, particularly in the context of Southeast Asia, this review is expected to reveal CFM’s impacts on biodiversity conservation and local livelihoods as well. Highlighting the trends of such studies,
this review intends to draw the attention of scholars and policy-makers to the implementation of CFM in Southeast Asia, where state-sponsored social and community forestry projects are a recent invention (Chankrajang, 2019). This review also explores and discusses the possible factors hindering the implementation of CFM in the region. However, the key focus of this review remains the impacts of CFM on biodiversity conservation and local livelihoods.

The next section of this review covers the methods used in selecting the studies to develop the review, followed by section three which presents the key findings of the review. The fourth section discusses the findings of the review. Finally, the conclusions based on the review findings and discussions are presented in the fifth section.

2. Systematic review framework and methodology

This study is based on the review of literature on CFM in Southeast Asian countries. The review question was formulated by referring to the guidelines for systematic review suggested by Pullin and Stewart (2006): This model was chosen among other models available in the literature because of its specific focus on conservation and environmental management. Based on the guidelines, the systematic review question raised here is “How are the current practices of CFM in Southeast Asia impacting on biodiversity conservation and local livelihoods?” Referring to the elements of a reviewable question suggested by Pullin and Stewart (2006), the Southeast Asian forests are thus defined as the subject, with CFM as the intervention, and biodiversity conservation and local livelihoods as the desired outcomes. These elements of the question were developed into key terms for the literature search and to further determine relevant inclusion and exclusion criteria for article selection. The trends and patterns of research studies into the impacts of CFM on biodiversity conservation and local livelihoods in the forests of Southeast Asian countries can therefore be drawn from the results to answer the inquiries of this study.

To answer the review question, peer-reviewed articles were searched in the online databases ScienceDirect, Web of Science, and Scopus. Specified key terms were selected, and advanced search functions were utilized along with Boolean operators to come up with the following search string: (“community forestry” OR “community-based forestry” OR “community forest management” OR “community-based forest management”) AND (“biodiversity” OR “awareness” OR “forest cover” OR “deforestation” OR “livelihood”). The key terms “awareness,” “forest cover,” and “deforestation” were included considering their close relation to biodiversity conservation. The search string was then entered in the search field and set to search titles, abstracts, and keywords. Further inclusion criteria were circumscribed
to: English language research-based articles; published within the time frame of the years 2000 to 2020; in the context of Southeast Asian countries; and related to the subjects of interest mentioned in the search string. The exclusion criteria were: articles considered irrelevant to the subject of interest; non-English articles; publications before the year 2000; and duplicate articles from the three web-based databases—these were eliminated scrupulously.

Using the key terms in the search string above, a total of 1,153 articles were found in ScienceDirect, 23 articles in Web of Science, and 656 articles in Scopus (as at June 3, 2020). Subsequently, with the inclusion criteria set to limit articles to those within the Southeast Asian region, the total number of articles was reduced to 247; 150 articles in ScienceDirect, 3 articles in Web of Science, and 94 articles in Scopus. However, although the inputs were already set to only show articles within the specified region, the search still returned articles from other regions. After sifting through thoroughly and eliminating irrelevant and duplicate articles from the three databases, a total of 22 articles were finally selected. The detailed information concerning the selected articles was then presented in chronological order from the most recent years of publication in a separate spreadsheet. The overall procedure of article selection based on the determined criteria in this systematic review can be visualized in hierarchical steps, as presented in Figure 1.

Figure 1. Criteria and procedure of literature search

\[N = \text{total number of articles returned in search phase.}\]

Source: Authors’ description of method.
To make sure that a similar systematic literature review has not already been conducted, the following search string was formulated to search for existing reviews considered similar to that of this study: (“systematic review” AND “community forest” OR “community-based forest” OR “community forestry”) AND (“biodiversity” OR “livelihood”) AND “Southeast Asia.” The search string was then entered in the Google Scholar search field, assuming that Google Scholar has broader database coverage, to find similar systematic reviews compared to the three previous databases used. The search resulted in 301 documents (as at June 4, 2020) within the period 2000 to 2020 and did not show any research articles similar to this study.

The 22 articles were analyzed to see the trends in terms of the frequency of studies, the geographical distribution, and the thematic focus related to biodiversity conservation and local livelihoods. The frequency of studies and the geographical distribution will highlight which countries in the Southeast Asian region have implemented CFM and to what extent it has progressed. The thematic coverage is categorized based on the impacts of CFM on biodiversity conservation and local livelihoods in order to indicate how CFM has in fact achieved the objectives of the two desired outcomes.

3. Results

3.1. Growth of research on CFM in Southeast Asia relating to biodiversity conservation or local livelihoods

This review found that research on CFM in the Southeast Asian countries related to either biodiversity conservation or local livelihoods has been moderately increasing. There is a dramatic increase in publications in the years of 2018 (5) and 2019 (6) compared to the previous years, when there were no studies for a period of six years from 2007 to 2014. Such findings indicate that studies on CFM and its impacts on biodiversity conservation and local livelihoods in Southeast Asia were lacking in the first decades of this millennium, which is quite reasonable, as CFM is considered to be a recent invention in the region. However, it is worth noting that, as shown in Figure 2, there is an increasing linear trend of publications, represented by the dashed lines, which reflects the growing attention around CFM, particularly on its outcomes in biodiversity conservation and local livelihoods.
Figure 2. Trend of scientific publications on CFM related to biodiversity conservation and local livelihoods in Southeast Asia

Source: Authors’ findings.

It can be identified that the significant increase in studies from 2015 onwards is predominated by studies in Indonesia. This can be attributed to the fact that in the presidential campaign ahead of Joko Widodo’s election in 2014, the expansion of community-based forestry was promised in the country (Putraditama et al., 2019). The commitment was then institutionalized under the Social Forestry (perhutanan sosial) Program in the wake of the election with an ambitious target to expand an area of 12.7 million hectares of state forest to be managed by local communities by 2019 (Putraditama et al., 2019; Resosudarmo et al., 2019; Santika et al., 2017). Similarly, the government of Myanmar has set a target of 919,000 hectares of forest to be under community management by 2030, of which 12% of the target had been achieved by 2016 (Feurer et al., 2018). However, Allendorf et al.’s 2018 study points out that the authoritarian regime in Myanmar prior to 2010 had somewhat protected the forests in the country, until democratization then made way for commercial interests to exploit Myanmar’s natural resources. Consequently, an astounding area of 2.732 million hectares of forest was lost in Myanmar from 2010 to 2015 alone, mainly due to agricultural expansion (Soe & Yeo-Chang, 2019). To a lesser extent, this appears to have also contributed to the increase in studies following the year 2015. In the context of Thailand, which contributed to the increase in studies after 2015, community-based forestry has been practiced informally for hundreds of years by the local people (Kongkeaw et al., 2019). However, formal recognition of forest communities by the government was only established in 1999 through the Forest Community Registration Program, which enabled local communities to be registered in forest reserves and later extended to other types of forests in
the economic forestry zone (Chankrajang, 2019). Nonetheless, the contexts from Indonesia, Myanmar, and Thailand can provide evidence that *de jure* rights to manage forests for local communities is the first step to the development of CFM.

### 3.2 Geographical distribution of CFM studies in Southeast Asia

The evolutionary dynamics of the reviewed articles in terms of geographical distribution exhibit a tendency of CFM studies to be concentrated in certain countries. The data reveal that Indonesia dominates the research studies, comprising a total of 45% of the overall studies reviewed, as shown in Figure 3. This can be explained by the fact that Indonesia has the largest territory of forestland in the Southeast Asia region (Food and Agriculture Organization of the United Nations, 2001, Chapter 24). Furthermore, as one of the most biodiverse countries in the world, with high rates of forest loss primarily due to agricultural expansion, Indonesia has already implemented several types of government-approved CFM schemes both in its primary and secondary forests (Putraditama et al., 2019; Resosudarmo et al., 2019; Santika et al., 2017).

**Figure 3. Geographical distribution of the reviewed publications**

*Note.* Whole numbers = total number of articles returned and analyzed for country or sub-region; % = proportion of *N* (rounded) represented by number of articles by country.

*N = 22*

Source: Authors’ findings.
Thailand has the second most frequent studies on CFM related to biodiversity conservation and local livelihoods, with a total of 18% of all the reviewed studies. Over 8,000 communities residing in and around forests in Thailand rely on forest resources for their livelihoods, and the decentralization of Thailand’s forest ownership and management has been initiated since the late 1990s to address the issue with support from nongovernmental organizations (NGOs), the local communities themselves, and the government through its Royal Forest Department (Chankrajang, 2019). Various researchers, as pointed out in Kongkeaw et al.’s study (2019), have observed that CFM in Thailand has been highly successful, particularly its community-based mangrove management program, which is widely promoted as part of a broader movement in support of CFM. Further, there are three studies in Myanmar related to biodiversity conservation and local livelihoods. Myanmar lost around 2.7 million hectares of forest between 2010 and 2015, which was the third highest in the world in terms of annual net loss (Soe & Yeo-Chang, 2019). The government of Myanmar has increased the promotion of CFM as a means to conserve its forest areas with the involvement of local communities since the advent of its democratization in 2010, with more international support through investments for conservation efforts (Allendorf et al., 2018). In general, the studies on CFM related to biodiversity conservation and local livelihoods in Southeast Asia seem to be very lacking. This may be because some research has been published in languages other than English, or has used different terms which were not accurately captured through the search string used in this systematic review. From a scholarly standpoint, it is therefore very important to agree upon one general terminology on CFM, particularly for the Southeast Asian region, so that the development of knowledge on this subject can be found and built upon, as it is through common terminology that the exchange of knowledge and technology transfer occurs (Sager, 1994).

Meanwhile, the lack of studies may simply be associated with inadequate cases to be studied, which would mean that the extent of CFM implementation in the region is still relatively low. It was exceptionally odd to find out that there were no related studies in Malaysia, as the forested area in the country is large. Even though a study in Malaysia had revealed the dependency of local communities on forest resources, formal CFM schemes had not been implemented in the area being studied (Nelson et al., 2015). That is to say, although informal versions of CFM-like practices may be occurring in some communities, papers that referred to these were eliminated because CFM cannot be secured without formal government intervention. Therefore, the Malaysian paper was eliminated along with any others not related to formal CFM schemes during the final sifting of irrelevant articles for this review. It is noteworthy that this Malaysian study also suggested that CFM needs to be promoted in the country to make the community’s dependency on forests more sustainable. This indicates that in countries where studies of CFM cannot be found, such as in the case of Malaysia, it is for the most part because it has yet to be implemented.
The challenge to initiate and implement CFM in Malaysia, according to Gill et al. (2009), lies in the Malaysian laws and policies, which reflect the government’s reluctance to grant forest management rights to local communities. As to why the government is reluctant requires deeper analysis and is beyond the scope of this study, but history has recorded that the “forestry in development” discourse had taken hold in Malaysia’s postcolonial era by political elites mired in developmentalism with antagonism toward local management practices deemed to be “unscientific” (Cooke, 1999). Legal support from the government appears to play a significant role in the implementation of CFM, as without it, secure CFM would not be attainable, as evident in the case of Malaysia. To some extent, how governments can set about recognizing the potential for local communities in managing forests will depend on how convincing the available literature and empirical evidence are regarding CFM as a viable option. In addition, the role of NGOs appears to be needed in assisting local communities to claim their environmental management rights and to be recognized by the government (Chankrajang, 2019; Kongkeaw et al., 2019; Resosudarmo et al., 2019).

### 3.3 Thematic focus of the selected publications

The next analysis of the selected articles is meant to portray how CFM practices in the region relate to the desired outcomes. Based on the thematic focus, the data shows that the selected articles for this review fall into three categories: focusing on the aspects of biodiversity conservation, on local communities’ livelihoods, or both aspects together, as presented in Table 1. Studies to date have predominantly focused on both themes, with almost half of the total publications falling into this last category (Table 1).

**Table 1. Thematic research focus of articles reviewed**

| Thematic focus                  | Frequency |
|--------------------------------|-----------|
| Biodiversity                    | 6         |
| Livelihoods                     | 6         |
| Biodiversity and livelihoods    | 10        |

*N = 22

Source: Authors’ findings.

Biological diversity or, as it is better known, biodiversity, according to Wilson (2003) is the key to the maintenance of the world; diversity is the property that makes resilience possible. As Wilson (2003) further explains, all of the kinds of plants and animals living in a given habitat are linked in the food web and are interdependent on one another. When a great number of species are eliminated, the local ecosystem will decay visibly, resulting from the decrease in the ecosystem's productivity and capacity to sustain life. Knize (2003) also asserts that the forests’ rich biological diversity constitutes a complex, interdependent plant and animal community, the
essential foundation from which human beings eat and breathe. This means that the more biodiverse a forest is, the more productive it will be, and the more benefits people will gain from it. The results of analyzing the 22 research articles support this argument, with the results indicating that biodiversity conservation and local livelihoods are closely related.

Current trends of research studies indicate that CFM in Southeast Asia has overall been able to conserve forests and improve local communities’ livelihoods. The implementation of CFM has demonstrated its success in reducing deforestation (Chankrajang, 2019; Ota et al., 2020; Putraditama et al., 2019; Santika et al., 2017); hence the attempt to conserve the forest and its biodiversity can be assumed to have been achieved as well. Indeed, the forests’ biodiversity in turn provides the basis for local communities’ livelihoods, where the diverse benefits from the forest are the key for their subsistence (Allendorf et al., 2018; Bridhikitti & Khadka, 2020; Feurer et al., 2018; Wulandari et al., 2018). Of all the reviewed publications, there was only one study in Indonesia that found that the implementation of CFM has been unable to fulfill both its environmental promise and economic opportunities in Central Kalimantan (Resosudarmo et al., 2019); and one study in Cambodia, Laos, and Vietnam that showed that CFM implementation has only been able to mitigate poverty rather than alleviate it (Sunderlin, 2006).

4. Discussion

4.1 The growing attention toward CFM in Southeast Asia

The Southeast Asian countries, apart from Thailand, share a similar colonial past (Lim, 2001). The preceding colonial administrations of Southeast Asian countries seem to have mandated a centralization of power, where natural resources such as forestland remained under centralized political authority even after the countries attained their independence (Webb & Shivakoti, 2007). This centralized management of forestland and its resources has demonstrated failures in conserving forests and maintaining forest cover (Allendorf et al., 2018; Chankrajang, 2019; Feurer et al., 2018; Kongkeaw et al., 2019). Condoned by the central elite, the destruction of the last primary rainforests in Southeast Asia was and is justified on the grounds of national development (Sunderlin, 2006), but the economic returns are generally concentrated in private profit with little local benefit. Such destruction of rainforests for the benefit of the few not only causes habitat loss that further threatens the forests’ biodiversity but also often violates the rights of local communities living in and near forests.
As centralized policies have generally failed to prevent forest loss, several governments in the region have explored alternative management paradigms and taken important steps to either reduce their claims over forests or to increase the rights of local communities over forests (Webb & Shivakoti, 2007). Hence, by the end of the twentieth century, local communities’ contributions in managing and benefiting from the forests on which their livelihoods and culture depended were gradually legitimized through various implementations of CFM. The management of natural forests in Southeast Asia has been slowly evolving toward decentralization that supports community stewardship and involves the formerly excluded local people in managing forest resources (Chankrajang, 2019). Through the implementation of CFM, local communities are given rights to manage and benefit from the forests and are believed to be placed in the best position to protect the forests in their own favor, which is in line with Agarwal’s (Agarwal, 1990) assertion that people will care for the environment only if they have the legal rights to manage it and to use its products.

The result of analyzing the 22 research articles indicates that the trend of research on CFM and its impacts on biodiversity conservation and local livelihoods in Southeast Asia is moderately increasing, implying that such forest management schemes are becoming preferred in the region. The reasons behind such an increase are not just because of the failures of centralized management in the past—there are various driving forces that have made the prominence of CFM in the region possible. In Indonesia for instance, the country’s political dynamics, following the fall of the Soeharto regime in 1998, have promoted decentralization that gives local governments more authority to manage natural resources including forests (Siregar et al., 2007). With a more decentralized government, poor forest margin communities have been better able to increase political pressure for CFM to alleviate poverty (Putraditama et al., 2019). Likewise, CFM in the Philippines was initiated due to the evolving democratization in the country during the 1990s (Hashiguchi et al., 2016). Conversely, CFM in Thailand, Cambodia, Laos and Vietnam has been practiced informally by the local people for hundreds of years before being promoted as part of a national forest policy after advocacy by international organizations and NGOs in the late twentieth century (Chankrajang, 2019; Kongkeaw et al., 2019; Sunderlin, 2006). In Myanmar, both the country’s recent democratization and the assistance from international organizations and NGOs promoted the implementation of CFM to protect its forest and settle conflicts over land rights (Allendorf et al., 2018; Feurer et al., 2018; Soe & Yeo-Chang, 2019). Hence, it can be inferred that there are internal and external drivers for the increase of CFM in Southeast Asia, without which it becomes more difficult or impossible to implement CFM as a means to protect the forests and empower local communities. However, the extent to which the internal and external factors are able to promote the implementation of CFM is beyond the scope of this review.
Although studies on the impacts of CFM on biodiversity conservation and local livelihoods in Southeast Asia are increasing in number, a common terminology is still lacking. The different terminologies regarding CFM in the reviewed publications suggest that CFM is perceived differently across Southeast Asian scholars and practitioners. As has already been mentioned by Arts and de Koning (2017), terminologies regarding the use, management, and conservation of forests by communities differ due to the varying extent to which the communities have full, partial, or no ownership of the forests. Arts and de Koning (2017) further explain that at one end of the spectrum, forest management is fully community-based and the forests are 100% owned by the community to manage and benefit. Whereas at the other end of the spectrum, communities only participate in state-owned forests and have limited access. However, this just shows that decentralization reforms are being weakened via insufficient power transfers and inappropriate local institutional arrangements, as has been argued by Ribot et al. (2006), in cases where central governments still retain control over forests through privatization. It can therefore be concluded that the two ends of the spectrum of local communities’ rights and ownership over forests are politically determined.

The various arrangements of land tenure of local communities over forests leading to the different terminologies can consequently impede the development of knowledge in the field in several ways. First, without consensus on a particular terminology for the use, management, and conservation of forests by communities, the term for such practices becomes too broad so that it is difficult to find related publications or other information. Such as in the case for this review, it is exceptionally odd to find that relevant studies in the region amount to so few, far fewer than expected, whereas in fact forests in the region are abundant and local forest communities are prevalent. Second, the various terminologies can cause barriers to working effectively with each other and make it especially difficult for researchers to collaborate with other researchers and stakeholders involved across national boundaries (Sager, 1994). Language is already a barrier in this research, and differing terminologies will only increase that barrier. And third, a common terminology indicates membership of a particular group of expertise, which means that the terms used by one group of professionals are not necessarily understood by others. Hence, a common terminology would enable researchers and practitioners from a wide field of expertise to work together and develop their understanding and practice. Addressing the complexities of environmental concerns requires the help of the world community of scientists (natural, social, economic, and political); of the world’s religious leaders; and also of the world’s people (VanDeVeer & Pierce, 2003). As a member of Minnesota’s Department of Natural Resources puts it:

Ecosystems are not only more complex than we think, they’re more complex than we can think. So, the more brains you have working on the problem, the better chance you have of coming out with something that’s acceptable to everyone or successful. (Berkes et al., 2003, p. 37)
4.2 Factors that hinder the implementation of CFM in Southeast Asia

A bottom-up and top-down approach can serve to identify the factors that might hinder the implementation of CFM in Southeast Asia. From a bottom-up approach, communities’ reluctance to be involved in CFM can be one of the underlying factors that hinder the implementation of CFM. Their reluctance can be associated with their lack of awareness concerning the benefits that they can derive from CFM projects beyond merely material or tangible benefits (Allendorf et al., 2018; Boedhijartono, 2017; Bridhikitti & Khadka, 2020; Muttaqin et al., 2019; Soe & Yeo-Chang, 2019; Wulandari & Inoue, 2018). To address this, an aptly arranged discussion setting that does not exclude the local communities in its process is necessary to provide clarity to local communities prior to the commencement of any CFM project (Larson et al., 2010). In addition, because local people have historically been excluded and disadvantaged (Sunderlin, 2006), they can be somewhat skeptical of programs that could exploit them. This is why clearly defined rights to manage land will also determine their willingness to participate in CFM projects (Suyanto et al., 2004). By including them from the very beginning and making room for them to have a say on their concerns, accepting their legitimacy and power, space would be created for developing collaboration that is grounded in the appreciation of different ways of understanding the world (Usher, 2000).

However, issues regarding land rights characterize a top-down situation which refers to governments’ dispositions toward devolution of power to local communities. Since devolution might be less profitable (in the short to medium term) than retaining command-and-control management, with full control of natural resources that can be either extracted for revenue or development of infrastructure, it is not surprising that many governments are still reluctant to allocate land to be managed and utilized by local communities or even take a position opposed to local management practices. However, the long-term costs of unsustainable exploitation by governments that neglect local interests will far outweigh its short-term profits (Boedhijartono, 2017). The drive to change this direction can come from academia, among others, with increasing empirical evidence to support the argument that environmental management involving local communities can provide solutions to environmental problems that benefit from the local communities’ site-specific ecological knowledge (Olsson & Folke, 2001).

4.3. Linking local livelihood and biodiversity conservation through CFM

The rich biodiversity of forests represents a wide array of values of local, national, and global importance and there are many reasons that may underlie concerns for its conservation. For the international community, for instance, the loss of biodiversity
is considered a global environmental concern demanding an urgent solution to protect and conserve the remaining tropical forests (Lévêque & Mounolou, 2003). However, the definitions of biodiversity and where it is threatened are mostly determined by northern, often urban-based, scientists and conservationists who are distant from the forests they want to conserve (Larson et al., 2010). Whether the conservation values assigned by foreign experts are relevant to the intricacies of the social life of Southeast Asia’s local forest-dwelling communities needs to be taken into account because the goods and services that humans derive from biodiversity can be viewed from different social and cultural perspectives.

The articles reviewed demonstrate that local communities involved in CFM projects in Southeast Asia are mostly concerned about sustaining the forests’ provision for their livelihoods. Without adequate knowledge, the use of certain resources can lead to their demise and affect whole ecosystems and their functioning (Berkes et al., 2003). By contrast, the use of forest resources for local communities’ livelihoods that is not exploitative has proven rather to improve forest quality (Allendorf et al., 2018; Kijtewachakul et al., 2004). A study conducted by Persha et al. (2011) in East Africa and South Asia unveiled similar instances where forest systems were more likely to have sustainable outcomes (above-average tree species richness and subsistence livelihoods) when local forest users participated in forest rulemaking. This means that, in fact, local forest communities have the kind of knowledge required to sustainably manage forest resources for their livelihoods. Such knowledge can be discerned as traditional ecological knowledge (Usher, 2000), as distinct from conventional or scientific knowledge.

According to Berkes (2012), traditional ecological knowledge may best be seen as an integrated package that includes local knowledge, environmental practices, social institutions, and worldviews. Peoples’ worldview of the environment constitutes the ideological or ethical basis that will determine their actions toward it. If CFM were to make biodiversity conservation compatible with local livelihoods, it is necessary to examine whether traditional worldviews are relevant to present-day resource stewardship and to re-examine our current attitudes toward the environment. Indeed, local contexts and cultures vary globally, and the worldviews of the people will also be diverse. These worldviews have culturally different attitudes toward the environment that have implications for the management of the environment. Yet, the findings of the reviewed articles indicate that forest communities in Southeast Asia have worldviews that might be compatible with biodiversity conservation if they are given de jure or secure rights to do so.
5. Conclusion

The results of this systematic review have revealed several points: Studies on CFM and its impacts on the biodiversity conservation and local livelihoods in the Southeast Asian region have been increasing, as has recognition of the close relationship between the two themes. Despite this interest, this field of research lacks a common terminology through which to share and build knowledge and understanding. Acknowledging the growing relevance of CFM in meeting multifunctional objectives of sustainable forest management, scholars’ attention toward such forest management practice is increasing. The increase of CFM studies in Southeast Asia indicates that its practice is also increasingly preferred, which is possibly due to the many driving forces that come from either outside of the country or within it. Amid this growth in CFM in the region, the challenge going forward lies in how to develop it as a means to protect the forests and the rich biodiversity they harbor, and to empower local and indigenous people who call the forests their home.

Forests and people are diverse across the region, and our understanding of CFM depends on the studies of it. Developing a clear and common terminology regarding the use, management, and conservation of forests by communities is likely to make it easier to develop successful CFM in the region. With a common terminology, scholars and practitioners would be able to collaborate across national boundaries and fields of expertise to focus on specific forest management practices with minimum ambiguity. However, a common terminology must take care not to undermine the diverse cultures and communities across the region, but rather serve as an umbrella term for forests being managed by local forest-based people. Since the extent to which the communities have full, partial, or no ownership of and legal rights to manage forests can be perceived as political, the use of terminology determined by such political dynamics can be ruled out for the sake of research convenience when the research has an emphasis on community management. CFM can be used as an umbrella term for the management practices of groups of people who have been granted rights over forest land regardless of the various types of tenure that exist.

Acknowledgment

This study has been supported by Universiti Kebangsaan Malaysia through research grant (SK-2020-024).
References

Agarwal, B. (1990). Social security and the family: Coping with seasonality and calamity in rural India. *The Journal of Peasant Studies*, 17(3), 341–412. doi.org/10.1080/03066159008438426

Allendorf, T. D., Swe, K. K., Aung, M., & Thorsen, A. (2018). Community use and perceptions of a biodiversity corridor in Myanmar’s threatened southern forests. *Global Ecology and Conservation*, 15, Article e00409. doi.org/10.1016/j.gecco.2018.e00409

Arts, B., & de Koning, J. (2017). Community forest management: An assessment and explanation of its performance through QCA. *World Development*, 96, 315–325. doi.org/10.1016/j.worlddev.2017.03.014

Berkes, F. (2012). *Sacred ecology* (3rd ed.). Routledge. doi.org/10.4324/9780203123843

Berkes, F., Colding, J., & Folke, C. (Eds.). (2003). *Navigating social and ecological systems: Building resilience for complexity and change*. Cambridge University Press.

Boedhihartono, A. K. (2017). Can community forests be compatible with biodiversity conservation in Indonesia? *Land*, 6(21). doi.org/10.3390/land6010021

Bridhikitti, A., & Khadka, B. (2020). Assessing factors to successful management for small-scale community forest under threat of urban growth: In a case of Ban Na Kham Noi community forest, Mukdahan, Thailand. *Journal of Sustainable Forestry*, 39(2), 167–183. doi.org/10.1080/10549811.2019.1631184

Chankrajang, T. (2019). State–community property-rights sharing in forests and its contribution to environmental outcomes: Evidence from Thailand’s community forestry. *Journal of Development Economics*, 138, 261–273. doi.org/10.1016/j.jdeveco.2019.01.010

Cooke, F. M. (1999). *The challenge of sustainable forests: Forest resource policy in Malaysia, 1970 to 1995*. University of Hawai’i Press.

Feurer, M., Gritten, D., & Than, M. M. (2018). Community forestry for livelihoods: Benefiting from Myanmar’s mangroves. *Forests*, 9(3), 150. doi.org/10.3390/f9030150

Food and Agriculture Organization of the United Nations. (2001). *Global forest resources assessment 2000 (FRA 2000)* (Main report). www.fao.org/forestry/fra/86624/en/

Gill, S. K., Ross, W. H., & Panya, O. (2009). Moving beyond rhetoric: The need for participatory forest management with the Jakun of South-east Pahang, Malaysia. *Journal of Tropical Forest Science*, 21(2), 123–138. www.jstor.org/stable/23616642

Hashiguchi, H., Pulhin, J. M., Dizon, J. T., & Camacho, L. D. (2016). Impacts of community-based forest management policies implemented by a local forest institution: A case study from Bayombong, Nueva Vizcaya, Philippines. *Small-scale Forestry*, 15, 335–355. doi.org/10.1007/s11842-016-9324-3
Hoskins, M. W. (2007). Foreword. In E. L. Webb & G. P. Shivakoti (Eds.), Decentralization, forests and rural communities: policy outcomes in South and Southeast Asia (pp. 14–16). SAGE Publications.

Kijtewachakul, N., Shivakoti, G. P., & Webb, E. L. (2004). Forest health, collective behaviors, and management. Environmental Management, 33(5), 620–636. doi.org/10.1007/s00267-004-3024-z

Knize, P. (2003). The mismanagement of the national forests. In D. VanDeVeer & C. Pierce (Eds.), The environmental ethics and policy book (3rd ed.) (pp. 534–542). Thomson Wadsworth.

Kongkeaw, C., Kittitornkool, J., Vandergeest, P., & Kittiwatanawong, K. (2019). Explaining success in community-based mangrove management: Four coastal communities along the Andaman Sea, Thailand. Ocean and Coastal Management, 178, Article 104822. doi.org/10.1016/j.ocecoaman.2019.104822

Larson, A. M., Barry, D., Dahal, G. R., & Colfer, C. J. P. (Eds.). (2010). Forests for people: Community rights and forest tenure reform. Earthscan.

Lévêque, C., & Mounolou, J.-C. (2003). Biodiversity. Wiley.

Lim, C. Y. (2001). Southeast Asia: The long road ahead (2nd ed.). World Scientific Publishing.

Lonn, P., Mizoue, N., Ota, T., Kajisa, T., & Yoshida, S. (2018). Biophysical factors affecting forest cover changes in community forestry: A country scale analysis in Cambodia. Forests, 9(5), 273. doi.org/10.3390/f9050273

Muttaqin, M. Z., Alviya, I., Lugina, M., Hamdani, F. A. U., & Indartik. (2019). Developing community-based forest ecosystem service management to reduce emissions from deforestation and forest degradation. Forest Policy and Economics, 108, Article 101938. doi.org/10.1016/j.forpol.2019.05.024

Nelson, J., Muhammed, N., & Rashid, R. A. (2015). Community’s forest dependency and its effects towards the forest resources and wildlife abundances in Sarawak, Malaysia. International Journal of Sustainable Development & World Ecology, 22(5), 401–412.

Olsson, P., & Folke, C. (2001). Local ecological knowledge and institutional dynamics for ecosystem management: A study of Lake Racken Watershed, Sweden. Ecosystems, 4, 85–104. doi.org/10.1007/s100210000061

Ota, T., Lonn, P., & Mizoue, N. (2020). A country scale analysis revealed effective forest policy affecting forest cover changes in Cambodia. Land Use Policy, 95, Article 104597. doi.org/10.1016/j.landusepol.2020.104597

Persha, L., Agrawal, A., & Chhatre, A. (2011). Social and ecological synergy: Local rulemaking, forest livelihoods and biodiversity conservation. Science, 331(6024), 1606–1608. doi.org/10.1126/science.1199343
Pullin, A. S., & Stewart, G. B. (2006). Guidelines for systematic review in conservation and environmental management. *Conservation Biology*, 20(6), 1647–1656. doi.org/10.1111/j.1523-1739.2006.00485.x

Putraditama, A., Kim, Y.-S., & Meador, A. J. S. (2019). Community forest management and forest cover change in Lampung, Indonesia. *Forest Policy and Economics*, 106, Article 101976. doi.org/10.1016/j.forpol.2019.101976

Resosudarmo, I. A. P., Tacconi, L., Sloan, S., Hamdani, F. A. U., Subarudi, Alviya, I., & Muttaqin, M. Z. (2019). Indonesia’s land reform: Implications for local livelihoods and climate change. *Forest Policy and Economics*, 108, Article 101903. doi.org/10.1016/j.forpol.2019.04.007

Ribot, J. C., Agrawal, A., & Larson, A. M. (2006). Recentralizing while decentralizing: How national governments reappropriate forest resources. *World Development*, 34(11), 1864–1886. doi.org/10.1016/j.worlddev.2005.11.020

Sager, J. C. (1994). Terminology: Custodian of knowledge and means of knowledge transfer. *Terminology*, 1(1), 7–15. doi.org/10.1075/term.1.1.03sag

Santika, T., Meijaard, E., Budiharta, S., Law, E. A., Kusworo, A., Hutabarat, J. A., … Wilson, K. A. (2017). Community forest management in Indonesia: Avoided deforestation in the context of anthropogenic and climate complexities. *Global Environmental Change*, 46, 60–71. doi.org/10.1016/j.gloenvcha.2017.08.002

Siregar, U. J., Rachmi, A., Massijaya, M. Y., Ishibashi, N., & Ando, K. (2007). Economic analysis of sengon (*Paraserianthes falcataria*) community forest plantation, a fast growing species in East Java, Indonesia. *Forest Policy and Economics*, 9(7), 822–829. doi.org/10.1016/j.forpol.2006.03.014

Soe, K. T., & Yeo-Chang, Y. (2019). Perceptions of forest-dependent communities toward participation in forest conservation: A case study in Bago Yoma, South-Central Myanmar. *Forest Policy and Economics*, 100, 129–141. doi.org/10.1016/j.forpol.2018.11.009

Sunderlin, W. D. (2006). Poverty alleviation through community forestry in Cambodia, Laos, and Vietnam: An assessment of the potential. *Forest Policy and Economics*, 8(4), 386–396. doi.org/10.1016/j.forpol.2005.08.008

Suyanto, S., Permana, R. P., Khususiyah, N., & Joshi, L. (2004). Land tenure, agroforestry adoption, and reduction of fire hazard in a forest zone: A case study from Lampung, Sumatra, Indonesia. *Agroforestry Systems*, 65(1), 1–11. doi.org/10.1007/s10457-004-1413-1

Usher, P. J. (2000). Traditional ecological knowledge in environmental assessment and management. *Arctic*, 53(2), 183–193. doi.org/10.14430/arctic849

VanDeVeer, D., & Pierce, C. (Eds.). (2003). *The environmental ethics and policy book* (3rd ed.). Thomson Wadsworth.
Webb, E. L., & Shivakoti, J. P. (Eds.). (2007). Decentralization, forests, and rural communities: Policy outcomes in South and Southeast Asia. SAGE Publications.

Wilson, E. O. (2003). The diversity of life. In D. VanDeVeer & C. Pierce (Eds.), The environmental ethics and policy book (pp. 459–465). Thomson Wadsworth.

Wulandari, C., Bintoro, A., Rusita, Santoso, T., Duryat, Kaskoyo, H., Erwin, E., & Budiono, P. (2018). Community forestry adoption based on multipurpose tree species diversity towards to sustainable forest management in ICEF of University of Lampung, Indonesia. Biodiversitas, 19(3), 1102–1109. doi.org/10.13057/biodiv/d190344

Wulandari, C., & Inoue, M. (2018). The importance of social learning for the development of community based forest management in Indonesia: The case of community forestry in Lampung Province. Small-scale Forestry, 17(3), 361–376. doi.org/10.1007/s11842-018-9392-7
