Souphanouvong University Journal of Multidisciplinary Research and Development
2025, Vol. 11, No. 02, 64-73
https://doi.org/10.69692/SUJMRD110264

Potential for Improving Livelihoods through the Commercial Utilization of Non-Timber Forest Products (NTFPs) in the Target Villages, Xaysomboun Province, Lao PDR

Houan VORASANE[1*], Phongxiong WANNENG[2], Si XIONG[3] and Aekathith CHONGVILAY[4]

[1]Faculty of forest Sciences, National University of Laos, Lao PDR

[1]Correspondence:* **Houan VOLASANE**, *Faculty of forest Sciences, National University of Laos, Tel: +856 20 56619365, E-mail:* houan85@gmail.com

Article Info:
Submitted: April 08, 2025
Revised: April 28, 2025
Accepted: May 06, 2025

Abstract

The aim of this research was to assess the potential uses of Non-Timber Forest Products (NTFPs) in selected developing areas of Xaysomboun Province. The specific objectives were to (1) identify and evaluate potential NTFP species for improved management and production, with the goal of enhancing rural livelihoods, and (2) compare income from NTFP sales with other household income sources. The study employed field-based data collection methods, including structured surveys and group discussions conducted across nine villages in three districts: Anouvong, Thathom, and Hom. A total of 174 households and several district representatives participated in the interviews. Data were analyzed using IBM SPSS Statistics 24, employing techniques such as multiple response analysis, basic descriptive statistics, and Pearson correlation. The results identified 13 high-value commercial NTFP species harvested for trade within the study areas. Among them, *Arenga westerhoutii* Griffith (locally known as MakTao) showed the highest potential for future promotion, with a suitability rate of 84–100%. Four other NTFP species were classified as having moderate potential, with suitability rates ranging from 50–66%. The NTFP sector contributed significantly to rural livelihoods, providing an average annual income of 11,300,000 Kip per household—just slightly below the income from rubber plantations (11,600,000 Kip). However, agriculture and livestock remained the primary income sources, generating approximately 33,100,000 Kip and 16,700,000 Kip per household per year, respectively. Despite their importance, the abundance of high-value NTFP species has declined significantly over the past 15 years. This decline is attributed to population growth, agricultural land expansion (particularly for rubber and cassava plantations), and inadequate enforcement of forestry laws and regulations.

Keywords: Potential, Improving Livelihoods and Utilization of Non-Timber Forest Products (NTFPs)

1. Introduction

Non-Timber Forest Products (NTFPs) play a vital role for both humans and wildlife, providing essential resources for various activities that contribute to economic and social development. In Laos, NTFPs are crucial for both domestic and international markets, supplying raw materials and finished products. Approximately 80% of the rural population relies on NTFPs for activities such as construction, firewood, fibers, medicinal plants, food, and income generation (MAF, 2019a). Additionally, NTFPs offer indirect benefits such as maintaining humidity, balancing the climate, providing habitats for wildlife, controlling floods, and preventing soil erosion. In Laos, NTFPs are seen as an incentive for forest management and protection (Nidkham et al., 2011).

The Lao government has prioritized the agriculture and forestry sectors as key drivers for national economic development, focusing on food security and nutrition. Efforts are directed toward promoting sustainable commercial agricultural production, reducing reliance on imported goods, and supporting forest resource products such as NTFPs to alleviate poverty among rural ethnic communities (Ministry of Planning and Investment, 2016). The Ministry of Agriculture and Forestry has developed a comprehensive plan for managing and sustainably funding national forests. This plan emphasizes the active involvement of stakeholders in preserving and developing forests, with a particular focus on community-led forestry

initiatives. These efforts include designating protected areas, establishing usage rights, maintaining biodiversity, promoting environmentally responsible businesses, and refining regulations to attract ethical forestry investments (KPL News, 30th April 2025).

While numerous studies have been conducted in Laos on NTFPs—including topics such as management, uses, marketing, and value chains (Souvanhphen et al., 2021; Bounchanh et al., 2021; Phongxiong, 2024)—there is a notable gap in research specifically related to Xaysomboun Province. This newly established province has been designated as a priority area for accelerated development by the government. Economic and social development within Xaysomboun has been progressing rapidly, with many villages increasingly relying on NTFPs for trade, thereby generating household income in line with the government's national development agenda (Laos National Assembly, 2022).

Rural people in Xaysomboun are actively engaged in collecting and utilizing a variety of NTFPs, such as rattan, sugar palm, and medicinal plants (Ministry of Agriculture and Forestry, 2019). However, there is a lack of scientific research focused on assessing the sustainable use and potential contributions of NTFP species to the livelihoods and development of rural communities in the region. Previous studies have provided limited insights into the comparison of income derived from NTFPs versus other agricultural products, particularly in Xaysomboun. Furthermore, research on which NTFP species hold potential for promoting management and production as commercial products to improve rural livelihoods remains scarce.

This research aims to assess the potential uses of NTFPs in the developing areas of Xaysomboun Province. The specific objectives of the study are:

- To evaluate the potential NTFP species for promoting management and production to improve rural livelihoods in Xaysomboun Province.
- To compare the income generated from selling NTFPs with other income sources in Xaysomboun Province.

The study provides crucial data for the promotion and sustainable management of NTFPs in Xaysomboun, benefiting both the government and private sectors. The findings identify NTFPs that are in high market demand, have stable pricing, and significantly contribute to the local economy, offering guidelines for sustainable development and management. The results also highlight trends in NTFP resources, risks of degradation, and the identification of high-potential species. This research is valuable for educational purposes and can serve as a case study at the Faculty of Forest Science, National University of Laos. The research focuses on nine villages across Anouvong, Thathom, and Hom Districts in Xaysomboun Province, which remain rich in NTFP resources (Figure 01).

2. Materials and methods

2.1 Sample size

The study was conducted in nine villages across three districts within Xaysomboun Province (Figure 01). The targeted districts and their respective villages were: 1) Anouvong District (Kok Hai, Om, and Tham Lo Villages); 2) Thathom District (Xieng Khoung, San Phou Xay, and Na Song Villages); and 3) Hom District (Hom Thad, Huay Xay, and Phou Ngou Villages). At least 60% of households in each village were interviewed, resulting in a total of 174 households. Household sampling was conducted using simple random methods (Abbott and McKinney, 2013; Sekaran and Bougie, 2016).

Since most villagers were engaged in family farming during the day, the research team took care to minimize disruptions by randomly visiting households to check if residents were available for interviews. Group meetings and discussions were held in the evenings or at night when villagers had returned from their farms. The research team included a district staff member who collaborated effectively with village chiefs.

The sample households included individuals who regularly collect non-timber forest products (NTFPs). In addition, interviews were conducted with local authorities, including representatives from the district agriculture and forestry offices, as well as the district industry and commerce offices. These interviews focused on policies related to NTFP trade promotion, management regulations, and sustainable harvesting and utilization issues within Xaysomboun Province.

2.2 Data collection tools

The methods used in this study were based on field data collection through both formal and informal interview surveys. Formal interviews were conducted with government officials from the Provincial Agriculture and Forestry Office (PAFO) and the District Agriculture and Forestry Office (DAFO). Informal interviews were carried out with local villagers through individual conversations and group discussions. Structured questionnaires were used to gather information from residents of selected villages within Xaysomboun Province, and all forms were carefully prepared in advance.

Prior to fieldwork, the research team underwent training to ensure effective data collection. The Participatory Rural Appraisal (PRA) approach was employed during group discussions to encourage local participation and knowledge sharing. This approach facilitated the identification of community problems and the development of inclusive solutions. PRA tools were used to gather villagers' insights on non-timber forest product (NTFP) collection methods, usage, and related challenges.

These tools also helped analyze seasonal patterns in agriculture, employment, health, and other NTFP-related activities throughout the year. Ranking and scoring techniques within the PRA framework were applied to prioritize NTFP trends over the past 15 years, identify key issues and resources, and assess the perceived importance of NTFPs based on community preferences (Thongmalay and Wanneng, 2007).

2.3 Data selection

The key questions in this survey focused on high-value commercial non-timber forest product (NTFP) species, harvest quantities, and the annual household income derived from NTFP collection. In addition, data were collected on income from selling NTFPs and other supplementary sources. The study also aimed to assess the importance and potential of various NTFP species for

future promotion and sustainable management at the study sites.

Villagers were asked to rank NTFP species based on several criteria: the availability of resources within the village, projected quantities in nearby forests, the potential for cultivation and management, and the species' market value and potential to generate high income. The research further explored challenges and trends related to NTFP resources in the study areas.

To analyze changes over time, local villagers evaluated and ranked the availability of each NTFP species across four time periods: 15 years ago, 10 years ago, 5 years ago, and the present. The field survey for this study was conducted between September and October 2024.

2.4 Data analysis

Data analysis was conducted using various techniques available in SPSS statistical software (IBM SPSS Statistics 24), including multiple response analysis, basic descriptive statistics, and Pearson correlation. The incomes of local villagers were examined, with a particular focus on income generated from selling NTFPs and other sources. Analyses were performed to rank the significance of NTFP species and assess their potential for future promotion and sustainable management at the study sites. The ranking of NTFPs and identification of potential species were based on several factors, such as the condition of available NTFP resources in the villages, projected resource quantities in the forests, the feasibility of species cultivation and management, and the importance of NTFP species in terms of marketability and the opportunity for high pricing within the study sites.

3. Results

3.1 Commercial utilization of NTFP species

Table 01 shown the NTFPs economically valuable and in high market demand throughout Xaysomboun Province. Among them, *Arenga westerhoutii* Griffith (locally known as MakTao) had the highest average annual harvest, with approximately 2,289.60 kg collected per household. The second most harvested species was *Dendrobium chrysotoxum* Lindley (Dokperug), with an average of 1,693.89 kg per household per year. In contrast, the least collected species was *Rhynchophorus ferrugineus* Oliver (Doung), with only 30 kg per household per year.

Overall, the average annual quantity of commercially collected NTFPs per household in Xaysomboun Province was 566.04 kg. The study also found that *Arenga westerhoutii* Griffith (MakTao) was present in all nine villages surveyed (Table 02). Villages such as San Phou Xay, Na Song, and Phou Ngou had a greater variety of NTFP species compared to others. On the other hand, villages like Om, Tham Lo, and Hom Thad had fewer species, particularly fewer commercially valuable ones. According to local villagers, these older and more densely populated villages have experienced overharvesting and forest resource degradation over time, which has reduced the availability of NTFPs.

3.2 NTFPs income

Dendrobium chrysotoxum Lindley (Dokperug) was the top income-generating NTFP, contributing approximately 34,000,000 Kip per household annually. The second highest was *Arenga westerhoutii* Griffith (MakTao), with an estimated annual income of 20,000,000 Kip per household. The remaining 11 NTFP species each contributed less than 5,000,000 Kip per household per year. (Figure 02).

On average, the NTFP sector provided around 6,000,000 Kip per household in annual income. These findings highlight the critical role of NTFPs as a major source of livelihood and income for local communities in Xaysomboun Province.

3.3 Compare NTFPs income to other income sources

Agriculture (including crops such as cassava, corn, rice, and pineapple), livestock raising, rubber plantations, and the non-timber forest products (NTFPs) sector. On average, the total annual income per household was approximately 33,000,000 Kip. A detailed analysis showed that agriculture generated the highest income, averaging 33,100,000 Kip per household per year, followed by livestock raising at 16,700,000 Kip per household per year.

The NTFP and rubber plantation sectors provided similar but comparatively lower levels of income, contributing 11,600,000 Kip and 11,300,000 Kip per household per year, respectively (Figure 03). Despite this, NTFPs are considered one of the key income sources for rural households. Beyond their economic value, NTFPs play an essential role in local food security. These resources are widely accessible to all segments of the rural population, including women, the elderly, youth, and households across different economic levels.

3.4 NTFP resources issues and trends

Local villagers were asked to rank the resource abundance of each NTFP species, and these scores were used to compare changes over four time periods: 15 years ago, 10 years ago, 5 years ago, and the present. The results revealed a significant decline in the abundance or density of all high-value commercial NTFP species over the past 15 years (Figure 04).

Among the most affected species were *Calamus rudentum* (Nkor Boun), *Calamus* sp. (Nkor Wai), and *Alpinia purpurata* (Khing Deng), which exhibited the steepest declines. For example, *Calamus rudentum* declined from an average score of 4.5 fifteen years ago to just 1.0 at present, representing a sharp decrease in abundance—from over 84% to 32% or less. *Calamus* sp. showed a similar downward trend.

The rapid decline of NTFP resources is likely due to multiple interrelated factors, including population growth, the expansion of agricultural land—especially for rubber and cassava plantations—a lack of awareness and practices for sustainable NTFP harvesting, and weak enforcement of forestry laws and regulations. Inconsistencies in rule enforcement across administrative levels—from village to district and provincial authorities—further exacerbated the issue. For instance, while a village chief might prohibit encroachment into forest areas, villagers could still obtain permission from district authorities, undermining local regulations. These inconsistencies have directly contributed to declining NTFP productivity and increased deforestation in the study sites.

3.5 Potential NTFP species for future promotion and trade

The ranking of potential non-timber forest product (NTFP) species was based on four main criteria: (1) species abundance (resource availability), (2) market demand and pricing, (3) income-generating potential, and (4) feasibility for cultivation. The results indicated that *Arenga westerhoutii* Griffith (MakTao) ranked as the highest potential species, with an average score of 3.83 across the four criteria. This suggests a suitability rating of 84% to 100% for future promotion and development in the study sites (Figure 05).

The second tier of high-potential species included five NTFPs with scores ranging from 2.68 to 3.38. These were *Dendrobium chrysotoxum* Lindley (Dokperug), *Rhynchophorus ferrugineus* Oliver (Doung), *Alpinia purpurata* (Khing Deng), *Thysanolaena latifolia* (Roxburgh ex Hornem) Honda (Dok Khem), and *Smilax glabra* Roxb. (Yahoua), with average scores of 3.38, 3.25, 2.95, 2.80, and 2.68, respectively. These species were determined to have moderate-to-high potential for commercial promotion and development, with suitability ranging from 50% to 66%.

In contrast, seven NTFP species received the lowest rankings, with scores between 1.81 and 2.61, equating to suitability ratings of 33% to 49%. These species included *Khuealiyylueang*, *Omphisa fuscidentalis* Hampson (Mengmae), *Calamus rudentum* (Nkor Boun), *Livistona saribus* Merr. (Mak Kor), *Calamus* sp. (Nkor Wai), *Dioscorea cirrhosa* Loureiro (LPN) (Mak Kabao), and *Coscinium fenestratum* Colebr. (Haem). These species were considered to have the lowest potential for future commercial development in the study sites (Figure 05).

4. Discussion

4.1 Commercial utilization of NTFP species

In Table 01 indicated that number is notably higher than findings from previous studies conducted in other regions of Laos, which reported only four to five high-value NTFP species. For example, Phongxiong (2024), in a study conducted in Sayaboury Province, documented five commercial NTFP species, including *Arenga westerhoutii* (MakTao), rattan shoots, wild ginger, and herbal medicines. Similarly, Souvanhpheng et al. (2021), in northern Laos, identified only four high-value species—bamboo, rattan, MakTao, and broom grass.

The variation in the number of NTFP species reported across studies may be attributed to differences in the criteria used to determine commercial significance. Some earlier studies focused exclusively on high-value or widely traded species and excluded lower-value but locally significant NTFPs, such as bamboo shoots and wild vegetables. In contrast, the present study applied a broader set of evaluation criteria, capturing both economic value and local livelihood importance, which likely contributed to the higher number of identified commercial species.

4.2 NTFPs income

In comparison and discussion, the findings of this study regarding NTFP income are consistent with previous research conducted in Laos. The NTFP sector is widely recognized as a vital source of income and food security for rural populations across the country. In the study sites of Xaysomboun Province, NTFPs contributed an average of approximately 6,000,000 Kip per household annually, underscoring the sector's role as one of the major income sources for local communities.

Comparable findings have been reported in other regions. For instance, Phongxiong (2024) conducted a study in Phieng District, Sayaboury Province, and found that NTFPs generated about 5,362,000 Kip per household per year, accounting for 8.5% of total household income. Similarly, John and Raintree (2015) reported that NTFPs contributed around 16% of rural household income in their study, which compared NTFP income to that from agriculture and livestock. These findings collectively emphasize the economic importance of the NTFP sector in rural Laos and reinforce its role in supporting household livelihoods.

4.3 Compare NTFPs income to other income sources

The agriculture sector contributed the highest income to the villagers, followed by the NTFP and rubber plantation sectors, which provided similar but lower levels of income compared to other sectors in the study sites of Xaysomboun Province (Figure 03). The literature review also supports the significant role of NTFPs in local income generation in Laos. For example, the IUCN (2021) reported that NTFPs contribute approximately 16% to rural household income, relative to other income sources such as agriculture and livestock. More recently, Wanneng (2024) conducted a study in Phieng District, Sayyaboury Province, which found that NTFPs contributed about 5,362,000 Kip per household annually, accounting for 8.5% of total household income. These findings further highlight the important contribution of the NTFP sector to rural livelihoods in Laos, demonstrating its continued significance as a valuable economic resource for local communities.

4.4 NTFP resources issues and trends

In over four time periods: 15 years ago, 10 years ago, 5 years ago, and the present, the rapid decline of these species can be attributed to several factors, including population growth, the expansion of agricultural land, and weak enforcement of forestry laws and regulations in the villages. Based on these findings, it is strongly recommended that the government, particularly the provincial and district departments of agriculture and forestry, implement stricter regulations and enforce existing forestry laws to manage NTFPs effectively in the study sites. Strengthening these measures would be crucial for restoring and enhancing NTFP resources in the future. (Figure 04).

Additionally, the study identified several challenges related to NTFP management and collection methods in Xaysomboun Province, such as the absence of a comprehensive NTFP management plan and harvesting regulations in the villages. The study sites also continue to experience high rates of forest encroachment, primarily due to the shortage of agricultural land. The literature review supports these findings, with previous studies indicating similar trends across Laos. For example, Phongxiong (2024), Souvanhpheng (2021), and the IUCN (2001) all documented significant declines in NTFP

resources, further emphasizing the need for effective management strategies to mitigate these losses.

4.5 Potential NTFP species for future promotion and trade

Based on four main criteria: (1) abundance of species (resource availability), (2) market demand and pricing, (3) high income potential, and (4) feasibility for cultivation (cultivable species). The ranking scores revealed that *Arenga westerhoutii* Griffith (MakTao) had the highest potential among the NTFP species in the study areas (Figure 05). A related study by Souvanhpheng et al. (2021) also examined the suitability of NTFPs for rural livelihood development in northern Laos. Their findings indicated that bamboo, rattan, *MakTao*, and broom grass were among the most suitable species for commercial promotion through plantation and management, thus contributing to local income generation.

This study acknowledges that different regions may have varying potential NTFP species. Such variations can be attributed to differences in resource availability, market demand, and the income potential of each species across various sites. These factors highlight the importance of region-specific approaches to NTFP promotion and management.

5. Conclusion

The results of this study identified 13 high-value commercial NTFP species harvested for trade in the study sites. Among these, *Arenga westerhoutii* Griffith (MakTao) was found to have the highest potential, with a suitability rate for future promotion ranging between 84% and 100%. Additionally, four other NTFP species were identified as having high potential, with suitability rates for promotion ranging from 50% to 66%.

The NTFP sector played a significant role in enhancing rural livelihoods in the study sites, contributing an income of 11,600,000 Kip per household per year. This amount was only slightly lower than the income generated from rubber plantations, which provided 11,300,000 Kip per household per year. In contrast, the primary sources of income for the villagers were agriculture and livestock raising, contributing approximately 33,100,000 Kip and 16,700,000 Kip per household per year, respectively.

The study also revealed a significant decline in the abundance and resources of all high-value commercial NTFP species over four time periods: 15 years ago, 10 years ago, 5 years ago, and the present. This decline was attributed to various factors, including population growth, the expansion of agricultural land—particularly for rubber and cassava plantations—and weak enforcement of forestry laws and regulations in the villages.

In light of these findings, it is highly recommended that future studies at the study sites explore opportunities for promoting additional NTFP species, particularly those with strong market demand and production potential. These include medicinal plants, mushrooms, wild fruits, honey production, bamboo shoots, and edible insects.

6. Conflict interest

We certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript

7. Acknowledgement

This study was made possible through funding provided by the Lao Government, particularly the Department of Science and Technology. The research team is sincerely grateful for this financial support, without which the study would not have been possible. We extend our heartfelt thanks to the Dean of the Faculty of Forest Science for valuable guidance and ongoing support throughout the research process. Our appreciation also goes to the Department of Agriculture and Forestry of Xaysomboun Province, the district agriculture and forestry offices, local authorities, and the villagers for their warm welcome, cooperation, and willingness to share essential data that contributed to the success of this study.

5. References

Abbott, M. L., and Jennifer McKinney, J. (2013). Understanding and Applying Research Design

Bounchanh, M., Oulathong, V., & Mixaykone, T. (2021). *NTFPs sustainable management plan in Meung District, Bokeo Province: Integrated conservation of biodiversity and forests project (ICBF), Vientiane Capital, Laos*.

Bounnyong, T., & Phongxiong, W. (2007). *Sustainable Community Forest and NTFPs Management in Louangnamtha Province, Laos*.

Chanthavong, N., Kheolakhone, P., & Ponnajith, P. (2011). *Compilation of economic NTFP in the northern part of the Lao People's Democratic Republic.*

KPL. (News 30th April 2025). *Sustainable Management and funding plan for Lao PDR National Parks launched.*

IUCN. (2001). *The role of forest food resources in village livelihood system. A case study in three villages in Salavan Province, Laos*.

IUCN . (2021). Hin Nam No National Park Joins IUCN Green List, Khammouan Province Laos.

John. R., & Raintree, B. (2015). *Agroforestry pathways for the intensification of shifting cultivation*

MAF. (2019a). *Agricultural Statistics 2019*. Vientiane Capital, Laos: Department of Planning and Finance.

Ministry of Planning and Investment. (2016). *Vision to the Year 2030 and the 10-Year Socio-Economic Development Strategy (2016-2026).* Vientiane Capital, Laos.

MAF. (2019b). *Forestry Law*

Lao National Assembly. (2022). *Resolution of the National Assembly meeting on the approval of the government's report on the implementation of the 2022 socio-economic development plan and the direction of the 2023 plan.*

Phommasane, S., & Oulathong, V. (2021). *Rapid assessment of selected NTFPs-suitability and*

interest of villagers in/around the protected areas: Integrated conservation of biodiversity and forests project (ICBF), Vientiane Capital, Laos.

Sekaran, U., & Bougie, R .(2016). Research Methods for Business and A Skill-Building Approach, *International Journal of Communications, Network and System Sciences, 9* (9)

Wanneng, P. (2024). *Management and Marketing Plan for NTFPs in Phieng District, Xayaboury Province*. Vientiane Capital, Laos. Department of Forestry

Table 01: Commercial NTFP species and use (kg/household/year)

No.	NTFPs species	Minimum (kg)	Maximum (kg)	Mean (kg)	Std. Deviation
1	*Arenga westerhoutii Griffith* (MakTao)	60	20000	2289.60	4050.354
2	*Thysanolaena latifolia* (Roxburgh ex Hornem) Honda (Dok Khem)	40	500	151.58	115.867
3	*Dioscorea cirrhosa* Loureiro (LPN) (Makkabao)	50	150	100.00	35.355
4	*Omphisa fuscidentalis* Hampson (Mengmae)	5	500	104.00	221.371
5	*Livistonia Saribus* Mer **(**Mak kor)	80	500	176.67	164.641
6	*Alpinia purpurata* (Khingdeng)	50	1000	451.00	366.225
7	*Rhynchophorus ferrugineus* Oliver (Doung)	20	50	30.00	14.142
8	*Calumus rudentum* (Nkor boun)	100	200	175.00	50.000
9	*Calamus sp* (Nkor wai)	10	100	54.29	45.040
10	*Coscinium fenestratum* Colebr. (Haem)	250	300	287.50	25.000
11	*Dendrobium chrysotoxum* Lindley (Dokperug)	15	5000	1693.89	2479.726
12	*Khuealiyylueang*	80	3500	1145.00	1582.435
13	*Smilax glabra* Roxb**. (**Yahoua)	700	700	700.00	0.000
	Average:			**566.04**	

No.	NTFPs species and use	Village (kg/household/year/village)									
		Xiengkhong	San Phou Xay	Na Song	Kok Hai	Om	Tha Lo	Hom Thad	Huay Xay	Phou Ngou	Total:
1.	*Arenga westerhoutii Griffith* (MakTao)	2750.00	745.00	1000.00	4637.50	1000.00		4300.00	4136.36	1007.69	2289.60
2.	*Thysanolaena latifolia* (Roxburgh ex Hornem) Honda (Dok Khem)		75.00	185.00			500.00	200.00	150.00	98.57	151.58
3.	*Dioscorea cirrhosa* Loureiro (LPN) (Makkabao)		100.00	100.00					100.00	100.00	100.00
4.	*Omphisa fuscidentalis* Hampson (Mengmae)						500.00	5.00	5.00	5.00	104.00
5	*Livistonia Saribus* Mer **(**Mak kor)	100.00	192.00								176.67
6.	*Alpinia purpurata* (Khingdeng)	60.00	300.00	50.00	800.00		800.00		600.00	150.00	451.00
7.	*Rhynchophorus ferrugineus* Oliver (Doung)		30.00	20.00						35.00	30.00
8.	*Calumus rudentum* (Nkor boun)		100.00	200.00						200.00	175.00
9	*Calamus sp* (Nkor wai)		50.00	70.00	10.00					55.00	54.29
10	*Coscinium fenestratum* Colebr. (Haem)		250.00	300.00						300.00	287.50
11.	*Dendrobium chrysotoxum* Lindley (Dokperug)		100.00	15.00	5000.00			5000.00	1688.33	32.50	1693.89
12	*Khuealiyylueang*					80.00			2000.00	500.00	1145.00
13	*Smilax glabra* Roxb**. (**Yahoua)			700.00						700.00	700.00

Table 02: Available commercial NTFP resources in the villages (kg/household/year/village)

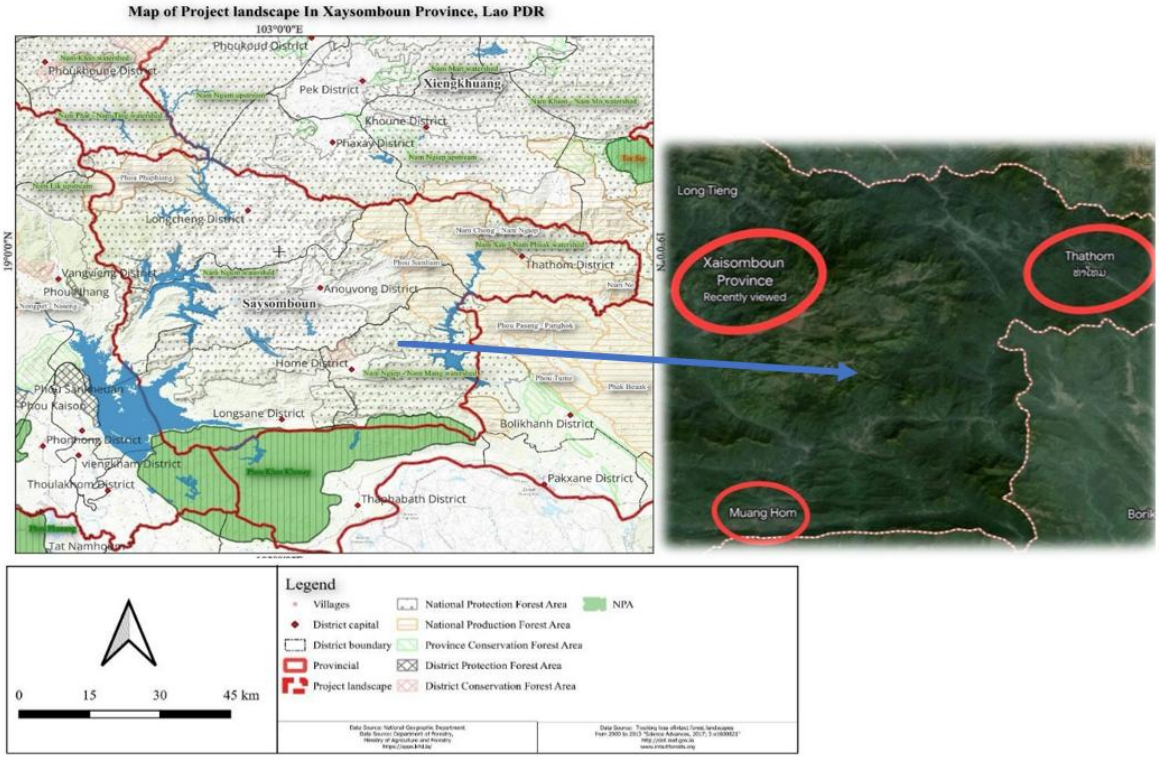

Figure 01: Study sites

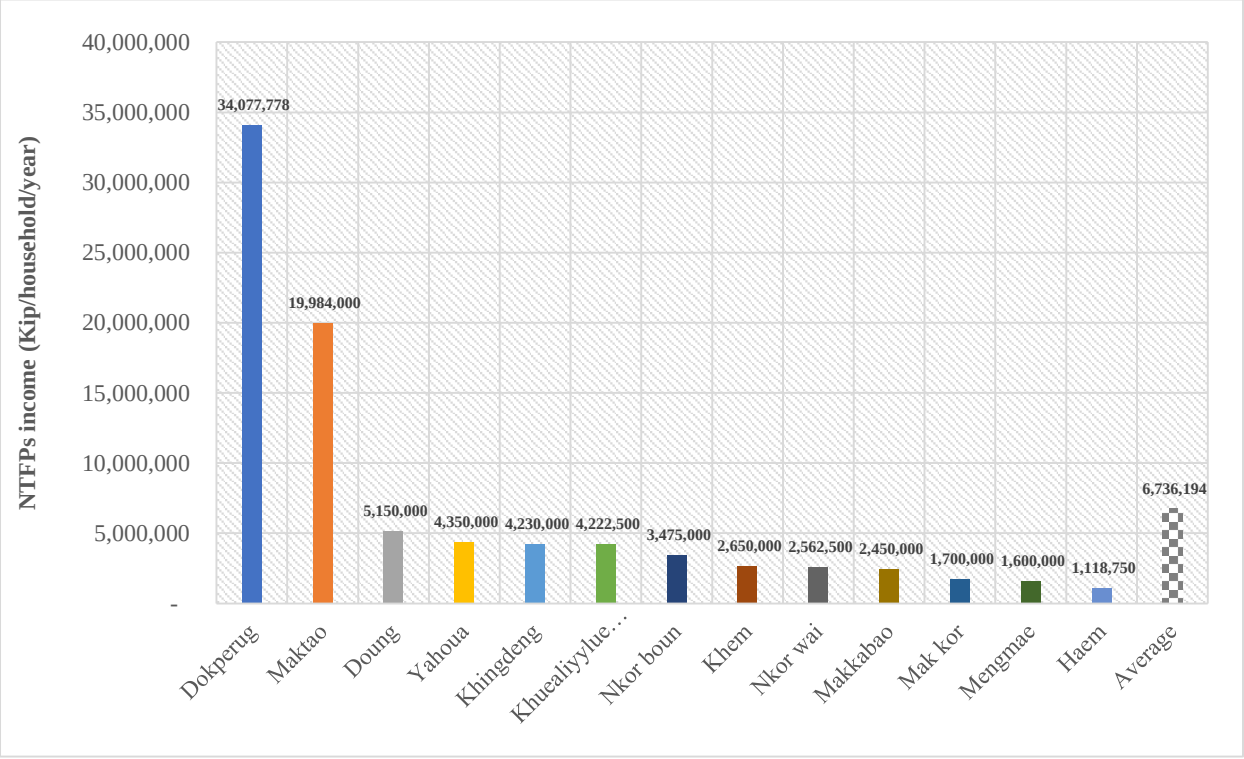

Figure 02: NTFPs income

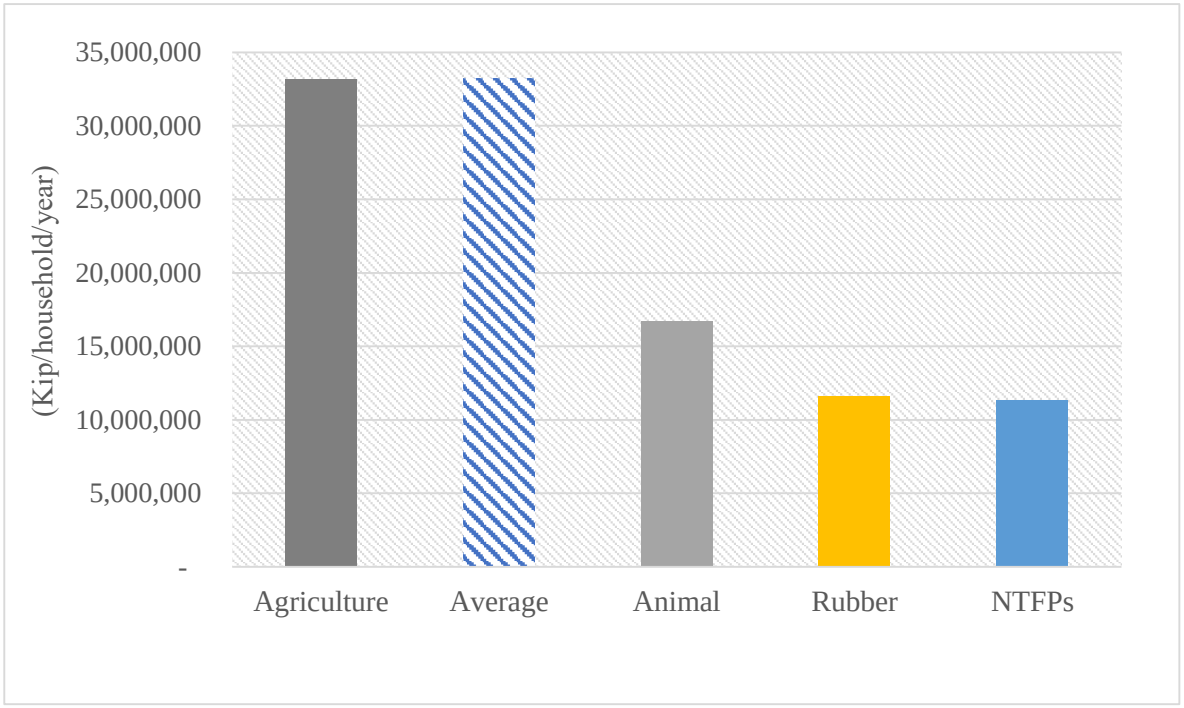

Figure 03: Compare NTFPs income to other income sources

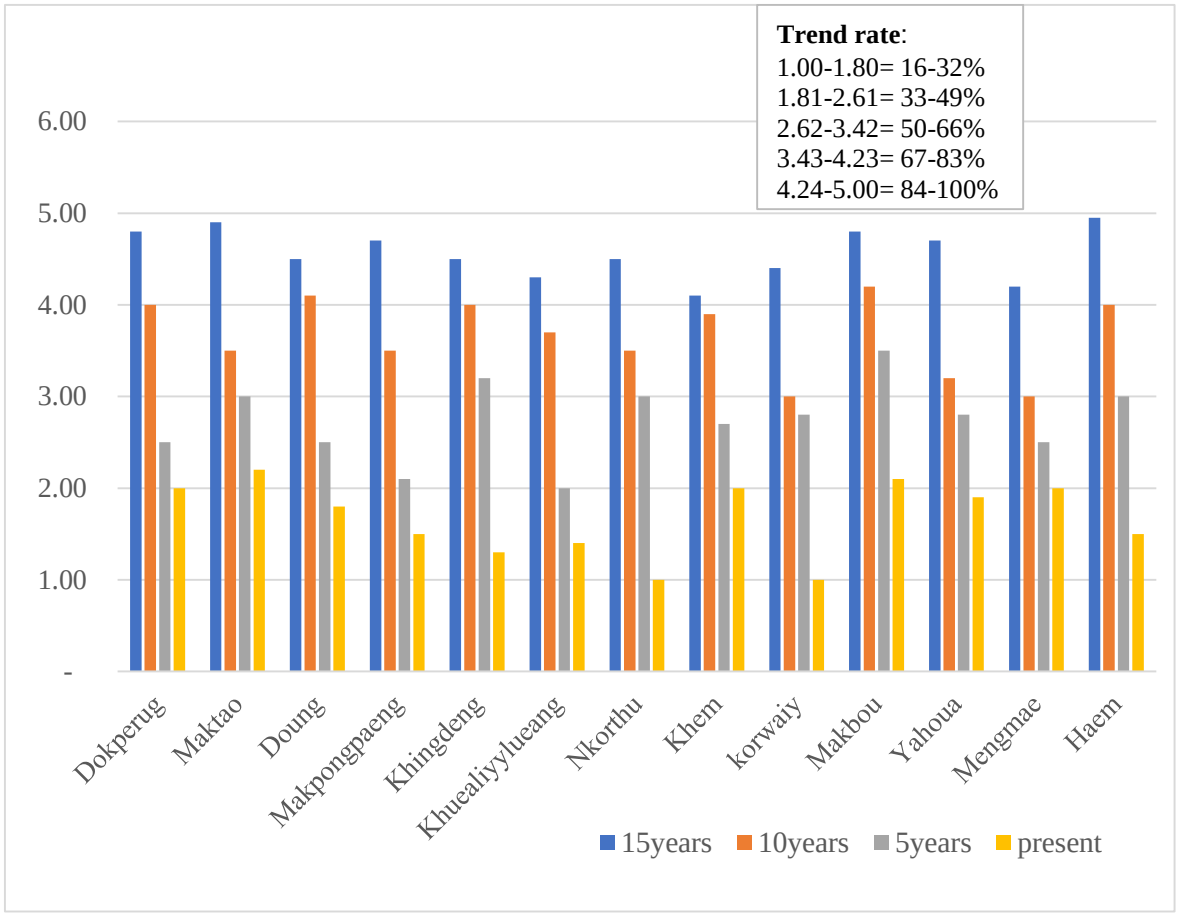

Figure 04: Compare NTFP resources over four time periods

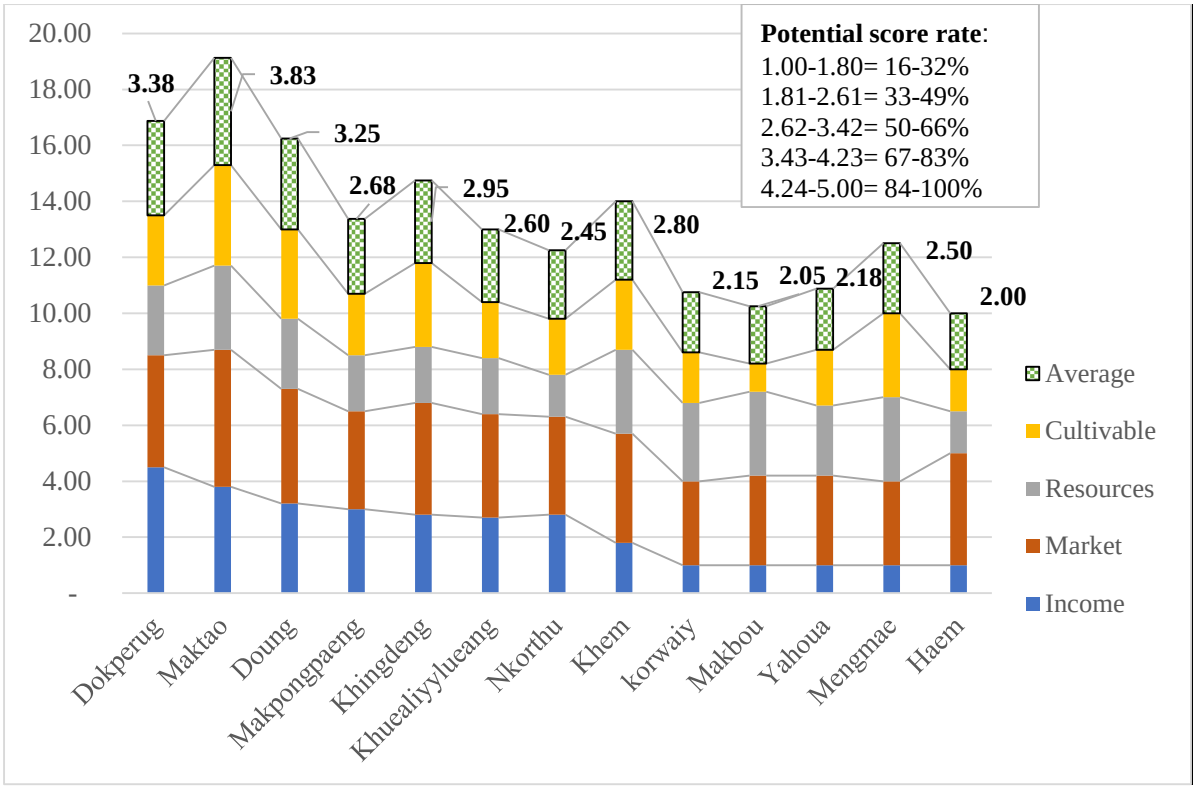

Figure 05: Potential NTFP species for future promotion and trade