

The ability to meet 2100-calorie intake to identify economic gap in Rimbang Baling

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Abstract. Bukit Rimbang Bukit Baling landscape in Riau is not only a habitat for the Sumatran tigers but also for indigenous people who have resided the area for centuries. These communities highly depend on the landscape for livelihood, with 94.1% engaged in rubber farming and non-timber forest product (NTFP) harvesting. Landscape designation as a Wildlife Reserve has been limiting the communities' activities. The remote condition, coupled with the decline in global rubber prices, has further increased the vulnerability of these communities to poverty. This study aims to provide an in-depth analysis of the welfare of the six villages adjacent and within the reserve by estimating the ability to meet the 2100-calorie intake threshold as one of indicators in calculating the poverty line, compared to the communities' monthly income. Field observation and secondary data involving 604 community members were analyzed using descriptive methods. The study found that income from rubber alone covers only 20.27% (425.67 kcal) of the daily calorie requirement, possibly increasing to 28.51% (598.71 kcal) for those who received government subsidies. This condition led communities to engage in activities to meet calorie needs and supplement income, such as NTFP harvesting, fishing, gardening, and potentially, unlawful activities like subsistence logging and wildlife hunting.

1 Introduction

The Bukit Rimbang Bukit Baling landscape (hereinafter referred to as Rimbang Baling) in Kampar Kiri Hulu District, Kampar Regency, Riau spans approximately 500,000 hectares and is a crucial area for the survival of Sumatran tigers (*Panthera tigris sumatrae*) and other wildlife. Even so, a community has coexisted and settled within the landscape for centuries. The presence of these communities is recorded in several documents: a record of the Pamalayu Expedition of Singhasari Kingdom (1275–1286 C), featuring the figure of Gagak Jao, who was said to be leaving Batu Belah in Subayang River; the record of Thomas Diaz in 1684 who visited Pagaruyung and passed through Rimbang Baling to make an agreement between Pagaruyung and the Vereenigde Oostindische Compagnie - Dutch East India Company

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(VOC), which also mentions the population of villages within the Rimbang Baling area; a historical site in the form of a staircase with an epigraph indicating the construction year in 1841; and the current caliphate system in the communities that existed since 1750 [1]. The communities consist of indigenous people, predominantly Malay and Minangkabau ethnicities, spread across 24 villages in Kampar Kiri Hulu District with 7 located deep into the forest [2].

As rivers serve as sole access, it takes 20-30 minutes to travel from the outermost village to the nearest by wooden boats. This remote condition results in a high dependency on the landscape for food and livelihoods. The older communities, especially those within the landscape, are accustomed to foraging for edible non-timber forest products (NTFPs) and wild fruits. They also met their animal protein needs by fishing for river fish and shrimp, with the cultural temporary closure fisheries '*lubuk larangan*' in certain river fishing areas also supporting this practice. Recent studies in 7 villages (5 within the Reserve and 2 in the buffer area) have shown a shift in the community, with an increasing dependence on food supplies from outside the landscape, such as relying -very likely- entirely on rice for carbohydrate needs. As for the livelihood aspect, at least 94,1% of the community within the area relies on natural rubber cultivation, where each household owns 1-2 hectares of farm inherited from ancestors. From 2005 to 2014, farmers earned 18,000 - 20,000 IDR per kilogram by selling to traders, who could collect up to 120 tons daily. Nowadays, prices have fallen to 6,000 - 7,000 IDR per kilogram, significantly reducing community income. This decline is attributed to global price drops and aging rubber trees [3-4].

In 2014, the Ministry of Environment and Forestry formally Bukit Rimbang Bukit Baling landscape with an area of 141,226.25 hectares as a Wildlife Reserve by decree No. SK.3977/Menhut-VIII/KUH/2014 [5], as the landscape is also revered as a category IV of the International Union for Conservation of Nature (IUCN) protected area [6]. The need for sustained support for conservation management and the activities of indigenous communities within the area then led to the establishment of a Conservation Forest Management Unit (CFMU) supported by decree No. SK.468/Menlhk/Setjen/PLA.0/6/2016 from the ministry. This management allows the communities to manage their rubber farm within the wildlife reserve, as it is supported by management blocks with different designations (Protection block, Rehabilitation block, Utilization block, Special block, and Cultural block). However, some of the inherited rubber plantations are located in Protection blocks designated for flora and fauna protection which cannot be utilized [3]. The idea of wildlife sanctuaries alone tends to limit the mobility of people and goods within the area to increase communities' prosperity [7].

The decline in rubber prices has led the communities to seek alternative livelihoods by harvesting and selling other NTFPs such as wild fruits, agarwood, herbs, honey, and fish. However, most of the NTFPs are considered unstable due to seasonal variations. Additionally, the area's designation as a wildlife reserve and the establishment of management blocks have restricted community movements, increasing communities' vulnerability to poverty. Despite these challenges, there are no publicly available documents detailing the current condition of the welfare levels of villages within the area, making it difficult to depict the current condition accurately. The calorie fulfillment estimate in communities is expected to approximate the actual condition roughly, as the 2100 calorie benchmark fulfillment is one of the indicators used by Badan Pusat Statistik (BPS-Statistics Bureau of Indonesia) to determine poverty levels. This study aims to provide an in-depth analysis of the welfare of the communities, specifically by assessing the estimated ability to meet the 2100 calorie threshold compared to the communities' monthly income.

2 Situational Contexts

Poverty is defined as the inability to meet basic needs, which is economically measured based on income or expenditure. Calculations using consumption level indicators are widely used in locations with highly fluctuating incomes, both in rural and urban areas. In rural areas, for example, income levels are highly dependent on the harvest season which can occur every three months. In urban areas, conversely, jobs in the informal sector lead to unstable incomes [8]. The absolute and relative approaches can be used to establish the poverty line. The poverty line itself is based on the minimum expenditure or income needed to determine: the amount of food required to meet specific calorie needs (food poverty line); and non-food and beverage expenditures necessary for a decent living (non-food poverty line). The absolute poverty line is almost universally used in developing countries because average incomes are below the poverty line and insufficient to meet minimum living needs. Indonesia uses 2100 kcal per day per adult for the food poverty line threshold, which is also the global standard recommended by the 1978 *Widyakarya Nasional Pangan dan Gizi* (WNPG). It is calculated by gathering information on the expenditure pattern for 52 food commodities [9].

The villages in the Rimbang Baling landscape, particularly those within the forest, are considered vulnerable to poverty due to their remote locations and the restrictions imposed by the reserve's status. In addition to the percentage of impoverished communities at the regency level, no published data accurately depicts the number or economic status of the communities within and adjacent to the landscape. A 2023 assessment conducted in six villages (closest to farthest from Tanjung Belit village at the buffer area, in order)—Muara Bio which adjacent, Batu Sanggan, Tanjung Beringin, Gajah Bertalut, Aur Kuning, and Terusan which within the reserve—identified 723 households with 2,657 residents (1,353 males and 1,304 females). As many as 94.1% of households rely on natural rubber sales as their primary source of income. The persistently low rubber prices have led the communities to seek alternative forest products for sale and personal consumption, such as agarwood, rattan, *jernang*, honey, stink fruit, *jengkol*, durian, and other wild fruits [3]. Unlike the restricted communities within the reserve, rubber farmers in adjacent villages that are also impacted can convert their rubber plantations to more profitable crops, such as palm oil. The trend of commodity switching has already begun in several buffer areas of the reserve, such as in Tanjung Belit, Gema, and Pangkalan Indarung village [1].

Over the past ten years, the rubber industry in Rimbang Baling Landscape has not recovered, with rubber being sold to collectors at only 5,000 - 6,500 IDR per kilogram. With only 5,708 IDR as the average price, farmers who collected around 145-205 kilograms of natural rubber per month received an average of 1,041,111 IDR, or equivalent to 12,493,333 IDR per year. This amount also includes harvests collected by farmers' wives who frequently enter the forest to help. Natural rubber can be harvested year-round, with peak yields from June to August. Even so, there are additional issues that further reduce the selling price of rubber in Rimbang Baling. During the rainy season, rubber tapping can decrease by up to 50% due to the difficulty of tapping and the rubber mixing with rainwater. The hilly landscape often places plantations on steep terrain, making harvesting more challenging. The rubber trees in Rimbang Baling are also considered old, with the majority of trees being several decades old, with some even exceeding 100 years. The age of the rubber trees affects the quantity and quality of natural rubber produced, where trees over 20 years old typically need to be replanted. However, the rubber planting method passed down through generations is not environmentally sustainable, as farmers often clear new land for planting instead of replanting in existing areas. This challenging terrain, the reserve status, declining production, and falling rubber prices have led to a trend of young people leaving the villages, leaving the elderly to bear. To cope with low prices, some farmers have resorted to mixing natural rubber

with stones and gravel to make it heavier, further reducing the quality and market value of the Rimbang Baling rubber industry [1].

Unlike natural rubber, other NTFPs aside from fish, dragon blood resin, betel nuts, and rattan, cannot be harvested year-round. Edible NTFPs such as stink beans, *jengkol*, *durian*, and wild fruits, are typically available for about three months, between June and November, depending on the specific commodity. The income from these NTFPs cannot be considered stable, as the harvests depend highly on weather and uncontrolled aspects. As for stink beans, 16.10% of the community from the 6 villages can harvest around 100 to 200 kilograms during peak season, with an average revenue of 21,000 IDR per kilogram. Farmers can generate an average income of 3,265,000 IDR or 302,083 IDR per month. The communities also self-consumed the forage stink fruit as a plant-based protein source and local dish ingredient. Moreover, *barangan*, *tampui*, and *pulasan* categorized as wild fruits can increase the income of 12.09% of the communities by an average of 933,333 IDR per year or 79,167 IDR per month. Wild fruits can be harvested from 200 to 300 kilograms during the season and sold for 2,667 IDR to 4,333 IDR per kilogram.

On the other hand, forest honey can only be harvested during April and May. Forest honey cultivation is limited to four villages: Tanjung Belit, Gajah Bertalut, Aur Kuning, and Terusan, with approximately 8.9% of households in each village. The profits vary depending on the yield. With a price of 100,000 IDR per kilogram, farmers can earn between 5,000,000 IDR to 50,000,000 IDR per year. On average, the annual revenue is 17,500,000 IDR, providing an additional income of approximately 1,458,333 IDR per month for farmers. As for fish, fishing is conducted in river areas that *Lubuk Larangan* does not restrict. The monthly catch ranges from 5 to 20 kilograms per month. With a selling price of 30,000 IDR to 60,000 IDR per kilogram, the average monthly income from fishing activity is approximately 3,525,000 IDR. Besides being sold, fish are also caught for daily consumption. In the six villages where data was collected, only 13.03% of households engage in fishing despite its high economic value and contribution to daily protein intake. On the other hand, extensive fishing can disrupt the ecosystem and threaten fish populations in the river.

In addition to foraging, the communities have started planting vegetable seeds in gardens or using polybags. The vegetables grown are diverse, including eggplants, cucumbers, long beans, and various types of chili. These homegrown vegetables help reduce household expenses and increase income, as they can be harvested year-round with an estimated selling price of 9,000 IDR per kilogram and an average annual profit of 1,758,333 IDR. However, 22.03% of households have only adopted this practice due to various challenges, such as the inability to purchase raw materials and maintenance supplies. Those without home gardens rely on floating markets or buying groceries at the Gema Village Market, which opens every Thursday. These methods also serve to meet other needs not fulfilled by foraging or gardening. These practices are considered to increase household expenses, as prices at Gema Market located in the buffer area are slightly higher than at the regency capital due to the transportation cost. There is also fuel cost for the communities to travel to Gema or wait for the floating market. For comparison, carbohydrate sources such as rice are sold at a range of 13,000 - 15,000 IDR per kilogram at Gema while the national average is 11,348 IDR; eggs sold at 34,000 IDR per kilogram compared to the national average of 27,196 IDR; and sugar sold for 25,000 IDR per kilogram compared to the national average of 14,937 IDR. Furthermore, communities need to buy gasoline for boat engines at 13,000 IDR per liter, with an average of 5 liters of usage for 2 hours of travel (also equivalent to a trip from Tanjung Belit at the buffer zone to Aur Kuning).

Based on the Village Information System (*Sistem Informasi Desa*), Ministry of Villages, Development of Disadvantaged Regions, and Transmigration of Indonesia, 390 households, or equivalent to 53.9% of the communities in 6 villages also depend on cash subsidies from the government, provided by various agencies to expedite poverty alleviation efforts [10].

Program Keluarga Harapan (PKH) from the Ministry of Social Affairs is the most widely distributed form of assistance in Rimbang Baling, targeting impoverished and vulnerable households. With the remote condition, Rimbang Baling communities are categorized as *Akses* beneficiaries and receive 1,000,000 IDR annually. At least 174 households are benefited from this support. The program also enables the household to receive annual supplementary assistance for each individual in the family who qualifies, such as pregnant women (2,400,000 IDR), early childhood (2,400,000 IDR), elementary school students (900,000 IDR), middle school students (1,500,000 IDR), high school students (2,000,000 IDR), severely disabled individuals (2,400,000 IDR), and the elderly (2,400,000 IDR) [11].

The *BLT Dana Desa* is the second most widely received, with 95 households being the beneficiaries. The village government allocates the subsidy, utilizing up to 25% of the annual budget to alleviate extreme poverty. In 2024, the program also aims to enhance food and livestock security and to prevent and reduce stunting cases. Each beneficiary receives 300,000 IDR per month for a year round [12]. There is also the *Program Indonesia Pintar* (PIP) which is provided by the Ministry of Education and Culture to students from impoverished or vulnerable households. The aid is distributed annually, with an amount of 450,000 IDR for elementary school students, 750,000 IDR for middle school students, and 1,000,000 IDR for high school/vocational students [13].

The *Kartu Indonesia Pintar-Kuliah* (KIP-K) program at the college level offers subsidies for high school graduates with academic potential. Tuition fees are paid directly to the university, while students receive a living allowance subsidy of 700,000 IDR per month, adjusted to the living costs in the university's region [14]. Although this support can greatly benefit the community in terms of education, only one household in the six villages receives this assistance. Furthermore, data from the Ministry of Villages, Development of Disadvantaged Regions, and Transmigration identifies 120 households receiving aid in other forms [10]. On average, beneficiaries receive 423,611 IDR per month.

3 Method

This study utilizes field observation and secondary data obtained from previous assessments and censuses, involving 604 community members and two months of data processing. The secondary data were analyzed using a descriptive analysis approach to compare the monthly income of the community with the amount required for household needs per month. The variables used include average monthly income, average daily calorie intake per capita in rural Riau province, national commodity prices at the consumer level, and population in the representative villages. The research narrowed down to six remote villages adjacent and within the Bukit Rimbang Bukit Baling Wildlife Reserve (BRBBWR): Muara Bio, Batu Sanggan, Tanjung Beringin, Gajah Bertalut, Aur Kuning, and Terusan.

4 Results and discussion

With a total population of 2,657 individuals (109 males and 124 females in Muara Bio, 205 males and 194 females in Batu Sanggan, 306 males and 301 females in Tanjung Beringin, 208 males and 213 females in Gajah Bertalut, 341 males and 291 females in Aur Kuning, 184 males and 181 females in Terusan), there are 723 households residing in the six villages. With an average of 3.67, this study assumes that there are 4 individuals in each household.

As shown in Table 1, the comparison between the average daily calorie intake per capita in rural areas of Riau Province in 2021 adjusted to meet the 2,100-calorie threshold and the cost of national food commodities in 2021 revealed that a household needs to spend at least 171,227 IDR for daily intake, or 5,136,807 IDR per month. This amount is 33.5% higher than

the 2024 Kampar regency minimum wage (*Upah Minimum Kabupaten* or UMK) of 3,412,764 IDR per month [20]. The commodities used in this calculation consist of 54 out of 190 items listed in the national census questionnaire, adjusting to local availability. National average food commodity prices were used due to a need for regional data. However, this discrepancy is considered minor given the significant price differences between Gema and the regency capital. This calculation excludes the inflation factor due to the newest data limitations, which could further impact commodity price fluctuations.

Table 1. Average daily calorie intake per capita in rural areas of Riau Province adjusted to Meet The 2,100-Calorie Threshold with the cost of National Food Commodities in 2021

Commodity Group	Average Calorie Intake per Capita in Rural Areas of Riau Province			National Threshold Fulfillment of 2100 Calories		
	Kcal	Gram	Price (IDR)	Kcal	Gram	Price (IDR)
Grains	833.25	307.28	2,882	855	315.16	2,956
Tubers	40.71	26.29	250	42	26.97	256
Fish	67.43	60.86	2,056	69	62.42	2,109
Chicken and Meat	89.06	22.67	2,048	91	23.25	2,100
Egg and milk	58.13	45.66	2,693	60	46.83	2,762
Vegetable	46.61	103.70	1,101	48	106.36	1,129
Nuts	37.97	48.30	1,890	39	49.54	1,939
Fruit	44.57	87.12	1,447	46	89.36	1,484
Oil and fat	343.12	29.74	303	352	30.51	311
Beverage ingredient	107.57	68.76	3,478	110	70.52	3,567
Spices	10.88	16.26	1,462	11	16.68	1,499
Other consumable	54.46	45.99	2,357	56	47.17	2,418
Ready meal	313.76	96.83	19,770	322	99.31	20,277
Total	2047.52	959.47	41,737	2100	984.06	42,807
Cost per household in a day			166,948	Cost per household in a day		171,227
Cost per household in a month			5,008,436	Cost per household in a month		5,136,807

Source: Processed data from Indonesia BPS, 2022; Indonesia Ministry of Agriculture, 2022; Indonesia Ministry of Marine Affairs and Fisheries, 2022; Indonesia National Food Agency, 2021; and Indonesia Ministry of Health, 2017.

The calculation method has several limitations, as reflected in the situation in Rimbang Baling. The 2100-calorie intake threshold applies to adult individuals, where in practice calorie needs vary according to age, gender, and activity level. For instance, an adult who walks two or more hours daily into the forest requires significantly higher caloric intake compared to a school-age child or an elderly person. An equivalent consumption scale approach, which accounts for the differing consumption levels of family members, could be employed to assess the household's calorie needs more accurately. On the other hand, research on the consumption equivalence scale conducted in the United States in 1997 by Kathleen Short et al. (1999) did not show significant differences in calorie requirements [8].

Minimum per capita daily calorie needs can also change due to shifts in the types and quality of goods available in the market and changes in population activities. This trend is evidenced by the updated minimum calorie intake threshold to 2,150 kilocalories as per the 2012 National Workshop on Food and Nutrition (*Widyakarya Nasional Pangan dan Gizi* or WNPNG) results and the latest dietary adequacy figures in the Ministry of Health Regulation No. 75 of 2013 concerning Recommended Dietary Allowances.

The intake approach to measuring poverty levels assumes a linear relationship between household size and consumption needs. For instance, larger families can purchase daily necessities at lower prices due to bulk buying [8]. However, buying in bulk is also susceptible to spoilage. Limited electricity in villages within the area makes the use of refrigerators impractical, requiring food selection to consider shelf life at room temperature or immediate cooking. This correlates with the Susenas calculation method, which is based on expenditure amounts. Most food purchases are of fresh or raw food (as-purchased), rather than at the intake or consumption level (as-consumed). The calorie difference between the as-purchased and as-consumed food can reach 5-10% due to damage, spoilage, and waste.

Table 2. Food commodity fulfillment by Local NTFPs

Commodity	Average of Monthly Harvest (kg)	Monthly Household Need (kg)	Monthly Fulfillment (%)
Fish	12.5	7.4969	166.87
Homegrown Vegetables	17.5	12.76	137.12

Source: Processed data of YAPEKA, 2023; Indonesia BPS, 2022; and Indonesia Ministry of Health, 2017.

Rimbang Baling's NTFPs can contribute to meeting daily consumption needs, either for personal use or sale. However, only fish caught from rivers and homegrown vegetables are accessible year-round. In contrast, stink beans, wild fruits, and honey are limited to their harvest seasons. Fish can meet 166.87% of a household's monthly consumption needs and serve as an alternative source of animal protein, replacing meat, eggs, and milk. Vegetables can fulfill 137.12% of monthly needs (Table 2). However, these figures may not reflect actual conditions, as not all households engage in fishing or home gardening, limited fish availability in rivers, and the lack of refrigeration can lead to spoilage.

Table 3. Communities monthly income compared to calories intake needed

No.	Source of Income	Monthly Income per Household (IDR)	Compared to the cost per household to meet average calorie intake in Riau rural area (%)	Compared to the cost per household to meet the 2100 Calorie Intake Threshold (%)
1	Natural Rubber	1,041,000	20,78	20,27
2	Natural Rubber with cash subsidies	1,464,722	29,35	28,51

Source: Processed data of YAPEKA, 2023

According to BPS data, the national poverty line as of March 2024 is 2,786,415 IDR [21]. As shown in Table 3, the communities remain below this poverty threshold. Although the exact poverty rate in the Rimbang Baling area is unknown, a comparative analysis of household income and the average national commodity prices converted to the average calorie intake in Riau Province provides insight into the community's food security. Based solely on the average annual income from rubber harvesting, households in the six villages

can only meet 20.27% of the daily 2,100-calorie requirement per household. Adding cash subsidies raises this figure to just 28.51% (Table 3). This translates to a mere 425.67 to 598.71 kcal consumed per person a day, a critically low level compared to Basal Metabolic Rate (BMR) at the average of 1696 kcal for men and 1409 kcal for women to maintain basic physiological functions at rest, such as breathing, cell production, and body metabolism [22]. Furthermore, the results indicate that most households fall short of meeting the food poverty line by March 2024 at 433,906 IDR per individual, or approximately 1,735,624 IDR per household.

Referring to Table 1, "ready meals" significantly increase the cost to meet the minimum requirement of 2,100 calories. "Ready meals" in this analysis include sweet bread and biscuits commonly found in the six villages. Field observations indicate that packaged foods and drinks are often viewed as luxury items, particularly given to children in the growth phase. This pattern can lead to macro and micronutrient deficiencies, resulting in health issues such as stunting, anemia, obesity, type two diabetes, and other degenerative diseases. The ability to meet the 2,100-calorie requirement along with essential macronutrients, is diminished when money is spent on packaged foods, including instant noodles, which are categorized under "other consumables" in this analysis.

In addition to the perception of certain foods as luxuries despite their minimal nutritional value, another critical issue is the diversion of income to support smoking habits among adults, particularly males in the six villages. The cigarette prices in Rimbang Baling range from IDR 10,000 to 35,000 per pack. The average per capita cigarette consumption and expense in Kampar Regency in 2023 was 19.5 cigarettes and 22,747 IDR per week [23,24]. With this knowledge, we can assume an individual would need to allocate around IDR 90,988 per month. This raises concerns about reducing the budget for essential food needs to support smoking habits. Moreover, the lack of highly nutritious foods, combined with unhealthy lifestyle choices like smoking, contributes to the community's vulnerability to diseases [7].

This study does not account for non-food consumption, which is also a factor in poverty measurement, such as clothes, housing, education, and transportation needs. Notably, the six villages surveyed only offer education up to the elementary level, except Batu Sanggan and Aur Kuning which provided secondary schools. Students must travel or even move to villages in the buffer zone like Tanjung Belit or Gema for higher education, which incurs additional costs for transportation or lodging. The inability to meet basic needs solely through rubber tapping and reliance on government subsidies has driven approximately 21.64% of households to engage in illegal logging, increasing their monthly income by up to 4,000,000 IDR. Additionally, some individuals resort to wildlife hunting. These activities are particularly concerning, as the landscape is a critical habitat for Sumatran tigers and their prey. Research by Syamsuardi in 2022 indicated that forest cover in the area has diminished due to anthropogenic factors, particularly agricultural expansion, which also poses the greatest threat to forest fruits and wild edible fruits [25].

5 Conclusion

Based on the analysis, it indicates 94.1% of the population in six villages can only meet 20.27% to 28.51% of the daily 2,100-calorie requirement per individual, consuming just 425.67 kcal per day if relying solely on income from natural rubber and 598.71 kcal with additional cash subsidies. The results are critically low compared to the average BMR of 1,696 kcal for men and 1,409 kcal for women to function organs normally. The calculation excludes non-food needs such as education, clothing, housing, transportation, and smoking habits among adults in the household.

The fact that 53.9% of households receive cash subsidies indicates a high level of poverty in the Rimbang Baling community. Residents likely supplement their calorie intake and

income through other means, such as foraging for wild fruits, home gardening, fishing, and lastly, engaging in, potentially, unlawful activities like subsistence logging and wildlife hunting. Further research is needed to examine the well-being of the communities in greater detail and to understand how daily food needs are met through self-sufficiency and the sale of consumable NTFPs.

These findings further illuminate the paradox where communities residing in a landscape rich in natural resources remain far from achieving prosperity. On the other hand, raising community awareness about the importance of meeting nutritional needs through local food sources is crucial. The preservation of forests and the environment to ensure a sustainable supply of resources for forest-dwelling communities is equally important. Additionally, government support is essential to enhance the management of CFMU with a focus on improving community welfare.

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Appendix A. Average National Commodity Consumer Prices (2021)

No	Commodity		Price per kilo (IDR)	Price per 100 gr (IDR)	Price per 1 gr (IDR)	Average (IDR)
1	Grains	Rice	11,348	1,135	11	9
		Corn	7,410	741	7	
2	Tubers	Potato	16,125	1,613	16	9
		Sweet Potato	7,206	721	7	
		Cassava	5,164	516	5	
3	Fish	<i>Mujair</i>	25,326	2,533	25	34
		<i>Patin</i>	31,816	3,182	32	
		<i>Gurame</i>	42,254	4,225	42	
		<i>Lele</i>	23,508	2,351	24	
		<i>Bandeng</i>	25,846	2,585	26	
		Freshwater prawn	53,140	5,314	53	
		<i>Mas</i>	37,376	3,738	37	
4	Chicken and meat	Chicken	37,809	3,781	38	90
		Goat	97,905	9,791	98	
		Beef	112,870	11,287	113	
		Buffalo	112,817	11,282	113	
5	Egg and milk	Chicken egg	27,196	2,720	27	59
		Duck egg	47,242	4,724	47	
		Cow milk powder	122,894	12,289	123	
		Cow milk	38,592	3,859	39	
6	Vegetable	Spinach	9,624	962	10	11
		Kale	8,233	823	8	
		Cabbage	1,862	1,086	11	
		Long beans	9,990	999	10	
		Tomato	12,018	1,202	12	

		Carrot	16,406	1,641	16	
		Cucumber	7,166	717	7	
7	Nuts	Soybeans	14,910	1,491	15	39
		Peanuts	24,427	2,443	24	
		Mung beans	23,852	2,385	24	
		Stink fruits	93,373	9,337	93	
8	Fruit	Orange	17,585	1,759	18	17
		Mango	19,161	1,916	19	
		Snake fruit	13,612	1,361	14	
		Apple	38,988	3,899	39	
		Banana	10,617	1,062	11	
		Papaya	7,740	774	8	
		Watermelon	8,521	852	9	
9	Oil and fat	Cooking oil	15,262	1,526	15	10
		Coconut	5,139	514	5	
10	Beverage ingredient	Tea	104,600	10,460	105	51
		Sugar	14,937	1,494	15	
		Coffee	32,225	3,223	32	
11	Spices	Red chili	42,194	4,219	42	90
		Cayenne pepper	54,952	5,495	55	
		Shallot	30,641	3,064	31	
		Garlic	30,271	3,027	30	
		Pepper	395,564	39,556	396	
		Nutmeg	26,896	2,690	27	
		Candlenut	48,720	4,872	49	
12	Other consumable	Instant noodle	51,250	5,125	51	51
13	Ready meal	Sweet bread	208,333	20,833	208	204
		Biscuit	200,000	20,000	200	

(Source: Indonesia Ministry of Agriculture, 2022; Indonesia Ministry of Marine Affairs and Fisheries, 2022; Indonesia National Food Agency, 2021)

Appendix B. Average Prices of Local Commodities in 6 Villages adjacent and within Rimbang Baling Wildlife Reserve

Group	Commodity	Price per Kilogram (IDR)			Annual Harvest (kg)			Total Income (IDR)	
		Lower limit	Upper limit	Average	Lower limit	Upper limit	Average	Monthly	Annually
Fish	River fish	30,000	60,000	45,000	60	240	150	562,500	6,750,000
Nuts	Stink fruits	12,000	30,000	21,000	100	400	250	437,500	5,250,000
Vegetable	Home garden	7,571	9,143	8,357	180	240	210	146,248	1,754,970
Fruits	Wild fruits	2,714	4,286	3,500	300	600	450	131,250	1,575,000
Beverage Ingredients	Honey	100,000	100,000	100,000	50	500	275	2,291,667	27,500,000

(Source: YAPEKA, 2023)