



## Evaluation of the Change of Relation Between the Inhabitants and the Public Forest: Case Study of Donparpao Public Forest

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**Key words:** Household strategies, public forest, Nongsang sub-district, Nakhon Nayok province, economic, Donparpao

**Abstract:** This study aimed to investigate the household strategies used by residents of Loadern village for the Donparpoa public forest, considering the relationship of villagers and public forests for developing guidelines for conservation of a public forest. This study utilizes a qualitative methodology for collecting and analyzing data, with the focus on perception and utilization of the Donparpoa public forest by villagers in Loadern village. The data collected can be divided into 3 groups which are: information about socioeconomics (114 persons), household information and individual interviews (35 persons) and key informant (5 persons). The study involved content analysis and a Likert scale was used for information analysis. Results showed that most households are employed (55.462%) and those working in agriculture have the highest average income per year (627,224 Baht/year/household). In the past the Donparpoa forest was used for animal raising by residents of Loadern village but at the present time villagers do not use the public forest. The reason that villagers do not use the forest is because often the villager's livelihoods are not related to public forest use or that villagers think that the public forest is owned by the local government. However, Donparpoa is a heritage and property of the village from their ancestors and the awareness of villager has an indirect benefit to the forest through environment protection. The recommendation of the study was that the Possible to in the future the local government should empower the villagers with participation in public forest management and protection and develop the Donparpoa area as a local learning area for students and villagers to increase local education about their local natural resources.

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## INTRODUCTION

Household strategies connect with livelihood strategies and survival strategies<sup>[1-3]</sup>. Most of the studies on household strategy are focused on Latin America and Africa. This study is regarding the household economic pattern over a day including the household member activity and the behavior under socialization or globalization and any differences from technology. Under any social or region-specific conditions humans will maintain themselves through natural resource acquisition<sup>[4-7]</sup>. The household strategies can be described as tools for analysis direction, community development or community adaptation for responding to global development<sup>[8]</sup>. Household strategies have a relationship with the process of decision-making about resource use for maintaining household members and their family. In the past the natural resources that the forest provides were very important to villagers for making a living because of the wide range of benefits and utilities such as natural food resources, fire, building materials, medicinal herbs and believes<sup>[9-12]</sup>. In the preliminary survey with community forest utilization around Nakhon Nayok, Prachin Buree and Srakeaw provinces, it was found that only a few villagers use resources from the community forest<sup>[13]</sup>. The villagers have reduced the usage of the community forest area majorly due to modern medicines which may be better than the locally available herbs, the local markets which have better food/raw material option. Hence, the benefit of and awareness about community forests have drastically changed over time.

The dynamics of village life have changed over the years<sup>[14]</sup> which is apparent in the differences in the relationships between public forest use and household strategies. Forest utilization in the past was closely related to factors of household consumption of villagers within the community<sup>[15]</sup> but at present, the daily activity of the villager are not dependent on the forest and at the same time the community is adapting from a rural to a semi-rural lifestyle in the part villager in community make agricultural are mainly occupation but present almost villager working in service and industrial part increasing<sup>[16]</sup>. In the present, the community has developed through urbanization via economic pressures (money transfer and access to loan)<sup>[17]</sup> good transportation is available and modern technology supports the household.

Awareness of the public forest in the community appears to have decreased over time; a comparison can be made between the theory of evolution and the relationship between development and lack of use of the forest: if

villagers do not use the public forest they will not see the benefits of it which in turn will make them less likely to protect or conserve it in a continuing trend for the future. If we can understand the villager's household strategies we can properly comprehend the relationship between villager and public forest. Developing household strategies, therefore are important for developing guidelines for public forest protection in the future.

The public forest are areas of reserved by government for people who could benefit from their use, according to the characteristics of the area or areas which people have used or have used the benefits of together will present will be also active or obsolete such as grazing area, cemetery, road, lake, etc., according to the law is considered a public area for citizen's use but who cannot permanently occupy the area, except for those the government authorities allow by regulations and law and the term and definitions used in FRA 2010<sup>[18]</sup> explain the right for management and use of a forest publicly is owner the forest and public forests are in this way covered by government, local government and community for participation of management together<sup>[19]</sup>. If designating a public forest it should be considered to use the term forest and the term public area, in which case it is appropriate to use the term public forest. Public forests present an opportunity to increase the forest area in the country and are a method to expand forest conservation (Forest land management section<sup>[20]</sup> moreover, the process of managing the forest increases government efficiency because it is a public concern.

Lacation Donparpoa public forest, Donparpoa derived from "Don", "Par" and "Poa". The meaning of Don is upland, or higher ground than the settlement area of a village, Par means forest or for the villagers it may mean a grove, and Poa is a plant species of *Croton stellatopilosus* Ohba., hence, the denotation of Donparpoa is an upland grove primarily consisting of *Croton stellatopilosus* Ohba.

Earlier, Donparpoa being a small forest had no protection from human-use. Subsequently, in Thailand an Act was signed in 1995 which made local government responsible for administration and management of local resources. The Act led the Nongsang Local Government to demarcate the Donparpoa Forest as public forest in the year 2000 but the public forest was not managed by the Nongsang Local Government until 2013. According to the local government data explains that the Donparpoa public forest has an area of 17.16 ha and has a forest zone of about 9 ha. The survey of Donparpoa public forest to have 26 genera of trees, 40 families and 44 species. Of shrubs it was found 18 genera, 22 families and 22 species and of mushrooms it was found 3 genera, 3 families and

3 species and finally of animals there were jungle fowl, mongoose and squirrel. At present the area of Donparpoa public forest is a local government initiative to conserve biodiversity under the project of Her Royal Highness Princess Maha Chakri Sirindhorn.

However, in the purpose of this research is to study the household strategy of villagers in leader in their use of Donparpoa public forest and moreover the consideration of this relationship may be useful in developing guidelines for forest conservation and the research are a case study for use the model for using in another area has similar situation in the future.

The conceptual framework In the household strategies of the Loadern village, with regards to Donparpoa public forest, there is a combination of evolutionary concepts with a sub-concept of “forest uselessness” which has resulted in decreasing forest awareness and a household adaptation concept for development under globalization or socialization, so, with regards to household economics, villager perceptions are a product of usage rate and perceived importance of the public forest, so, the content related to livelihood of villager under concept of sustainable livelihood to explain with dimensions are related to villagers livelihood such as economic sides, natural resources utilize etc., so that are concept related to activity maintains themselves and family to good lift quality<sup>[21,22]</sup>. Our framework, however, covers villagers’ past use of the public forest makes a consideration of the dynamics such as the benefit from public forest under villager lift way considers between timing in the past and present and households adaptation of the villagers and the public forest, this is order that these relationships be understood for making predictions of future forest use. The household strategies can be understood by examining: the villager’s perception of the value or benefit provided by the forest, the villager’s use of the forest and the management required for the forest and these strategies can be evaluated for making predictions about future trends and for creating guidelines.

## MATERIALS AND METHODS

This study uses mix methodology for collecting and analyzing data with the focus on perception and utilization of the Donparpoa public forest by villagers in Loadern village.

**Study site:** This study focuses on Loadern village, Nongsang sub-district, Prakpree district, Nakhon Nayok province. The public forest of Loadern village is Don Pra Pao public forest limit of Universal Transverse Mercator (UTM) in 47 749785.21 m E1572595.45 mN.

**Sampling of data collection:** There are 3 groups for collected data for cover content in this study:

- The 119 households used for data about socio-economics (use data combined with local government data) for considers with general economic and household situation of villager in the community
- The 2. 35 persons for individual interviews considers to public forest using and perception with public forest management in household scale
- The 5 key informants (KI) which are: local government officer, senior in a village and village head man for study to history of the public forest and dynamic of the village and livelihood of villager in community

**Tools for collecting data:** The tools for collecting data are short-questionnaires for collected household data and Semi-Structured Interview (SSI.) for individual and KI interview in the topic with household under technique of topic-rapid rural appraisal (topic-RRA)<sup>[23]</sup>.

**Data analysis:** This study uses descriptive analysis with socio-economic data and content analysis information from interviewing and use Likert scale (1-5 scale) for considering rate villager perception of public forest utilization and conservation (1 = minimum, 2 = min, 3 = medium, 4 = max, 5 = maximum) for quality data use content analysis for groping topic and use triangulation technique for checking data.

## RESULTS AND DISCUSSION

**Context of loadern village:** The Loadern village has 137 households with a population of 297, comprising of 137 males and 160 females<sup>[24]</sup>. In the survey around the village small paddy fields and forested areas were observed. The distance between the National Park and dwelling areas of the village is about 2 km and the Donparpoa public forest is about 300 m from the dwelling area, as shown in the map in Fig. 1. Earlier, majority of the villagers were of the Phuan ethnic group but at present in the village no people with Phuan characteristics (language, culture and festival) were observed. This may be because of the gradual changes in social development, globalization and urbanization, etc., resulting in the villagers of the community developing a homogenous characteristic.

Last 40 years ago, the villager in community mostly works in agriculture sectors such as grow rice, plantation agroforestry around foothill, so is some part of Khaw Yai national park and found natural food around forest nearly the community. However, around 1994 the National park



Fig. 1: Map of Loadern village and Donparpoa public forest (Google Earth, 2019)

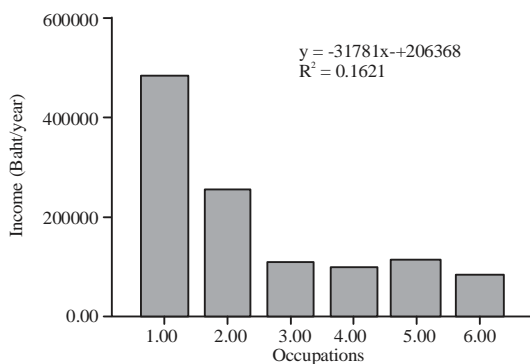


Fig. 2: Relationship between villager occupation and household income in Loadern village; 1 = agriculture, 2 = government officer, 3 = Business, 4 = Employee, 5 = Officer in public company in Bangkok, 6 = Not occupation

promoted to stop all activity to used in the National park area, combine to transportation between community and city are better more villager go to work in the city increasing and more villager send the children go to study in the city increasing, so the situation affect to mainly people to live in the village duration daytime period is old peoples and at present the agriculture are less sector in the community and villager because more labour senior and more labour working outside the village.

**Socio-economics of household villagers in Loadern village:** Out of 137 households, 119(86.861%) can be classified into 6 main groups of occupation. These are Office (OF) in and around Bangkok with about 4.201%, Not Active (NA) which means they are not in work but get money sent back from children with about 15.966%, Government officers (GF) have 6.722%, Employee (EM)

were 55.462%, agricultural occupations such as cultivation of paddy fields, orchards, etc. has 7.563% and Business (B) which includes local merchant has 10.084%. The highest average household income in Loadern village with the interrelation between occupation and income is of the agricultural occupation having and an average income of 627,224 baht/year. The data which covers villager occupation related to household income ( $R^2 = 0.1621$ ) is presented in Fig. 2. However, in the present time all occupation do not use the resources from a public forest.

**Back ground of Donparpoa public forest use before 1994:** The Loadern village is about 2 km from Khao Yai national park. Villagers traditionally used Khao Yai to collect natural food, until in 1995 an initiative was started in Khao Yai National Park to cease the use of the national forest for the collection natural food. Similarly, in the past the Donparpoa Public Forest was used by the villagers for livestock raising and collecting fire wood, and the area was locally known as “Pa Hou Rai Pai Na”, until a residential area of the community increased the area around the forest public where villagers could build their houses. However, after 1995, the Thailand government began to promulgate local council and local government into action, the effect being that the Nongsang local government now has a function of managing the Donparpoa as a public area in the sub-district until the present day.

**Perception of public forest utilization:** The villager perception with Donparpoa public forest utilization collected by group interview of villagers and found 5 topic with utilizing are use for collection of firewood use for collecting herbs use for natural foods use for raising animals and use as a relaxing area, after keep the 5 topic

Table 1: Numbers of villagers using Donparpoa public forest

Topic	Maximum	Max.	Medium	Min.	Minimum	N	$\bar{X}$	SD	Meaning
Firewood	0	0	1	3	31	35	1.142	0.423	Minimum
Herbs	0	0	0	0	35	35	1	0	Minimum
Food	0	0	0	0	35	35	1	0	Minimum
Raising animals	0	0	0	0	35	35	1	0	Minimum
Relaxing area	0	0	1	3	31	35	1.142	0.423	Minimum
Average	0	0	0.4	1.2	33.4	35	1.057	0.277	Minimum

the researcher settle 5 level pre topic for villager decides rate of the public forest and found to most villagers do not use the public forest ( $\bar{X} = 1.057 \pm 0.423$ ), present in Table 1. The critical analysis of the collected data indicates that at present, the inhabitant of the settlement near the Donrapoa Public Forest refrain from using the forest for their daily needs. It might be due to the following issues which has been inferred from the data analysis:

- People think there is nothing of use to be found in Donparpoa forest
- More villagers work outside the village and travel back later, resulting in no time to go to the forest
- The public forest is subject to local government protection and conservation
- The forest is too far from the villager's houses
- Buying food from a market is easier than collecting in the forest
- Modern medicine is superior to traditional herbs
- The high temperatures make the weather not suitable for visiting the forest
- There are no animals being raised
- Household kitchens use a gas stove, so there is little need for firewood

As more young people leave to work in the city, the old people remaining find it physically difficult to go to the forest. The public forest usability to viewpoints in conservation.

In general people conserve resources to utilize and have some awareness as to value of resources such as the household of villagers. Often an awareness of the value of forest conservation has a possibly unintended result of villagers in Loadern village not using the public forest at all<sup>[25, 26]</sup>. Data form group interview with reason that a villager wants to conserve the public forest can be classified as 4 topics:

- The Donparpoa is a public forest, so they should protect and conserve for villagers in the next generation
- The forest should be protected as a source of fresh air for the village
- Protection from the impact of climate change

- The Donparpoa is a heritage which should be protected for the next generation to learn about native plant species

The aforementioned causes for the conservation of the forest by the villagers can be concluded broadly into two categories, protection of the forest as part of the local heritage and c for protection of the environment. However, the villagers did not refer to any of the usefulness of the forest.

**Changing occupation of the households:** In previous times Thai society believed that agriculture is the main occupation of villagers of the country but the data of reveal otherwise. The report contains that the country had a population of 64.23 million in 2012 with a population of 23.68 million persons or 36.86% of the total population in the agriculture sector. However, the labor in agriculture sectors had a decreasing trend in comparison to industrial and service sectors which was increasing. As a trend distributed in all areas of Thailand, most households have a member working in the city or outside the village. Nakhon Nayok province has a population of 251,188 persons and the GPP of Nakhon Nayok province during 2002-2009 found non-agriculture sectors >400% higher than agriculture sectors and when examining GPP per year of non-agriculture sector there is an increase every year the GPP rate of agriculture sector increases every year. The GPP value between the non-agriculture sector and agriculture sector in Nakhon Nayok province. This is an overall trend of socio-economic change and the major occupations of villager in community are subject to continuing change.

In the survey the Loadern village is similar to other villages in the country with regards to the occupations of the household because in previous times the main occupation in the village was in the agricultural sectors such as in the paddy field, cattle raising, orchard etc., so, the activity will be related to used resource from a pubic area and the pubic forest whereas at present the employee is the main occupation of a village. The occupation of villagers has an effect as to their land use, for example, many households in the village have sold land because it is no longer used for agriculture or there is not enough labor to do so or people don't use the Donparpoa public forest because villagers go to work in Nakhon Nayok city

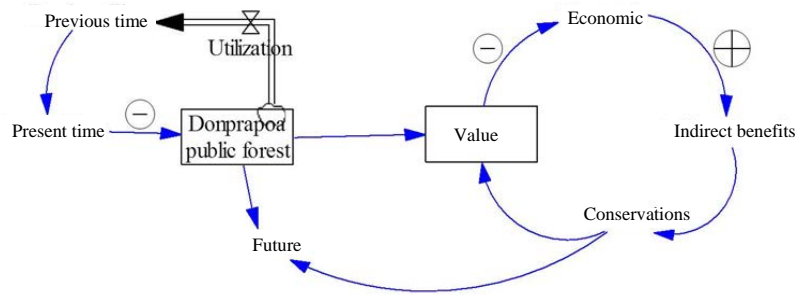


Fig. 3: The relation scenaro of villagers and Donparpoa public forest

early in the morning and come back home late with the effect of them having little time to go to the forest. The relationship of occupation to household is a villager livelihood pattern related with forest utilization because occupations are connected to socio-economics and the stability of a household<sup>[27]</sup>.

#### Dynamics of public forests in livelihood of the locals:

Data form survey and interview with the relationship of villagers and forest in previous times shows that agriculture was one of the main activities of villagers in the community and that Donprapao public forest was a grazing zone for cattle raising by the community. At present, however, villagers have move out the village in favor of working in the city and so, cattle raising has decreased. This situation is important because in our data from the interview it can be shown that 31 households (88.6%) do not use the Donparpoa public forest and 4 households (11.4%) use only a little. In previous times villagers used the area for livestock raising but presently they are not doing it. Perhaps as a result, the value of Donparpoa is of little economic consequence in perception of the villager but its highest benefit is as an indirect benefit such as for CO<sub>2</sub> absorption or in production of O<sub>2</sub>. The villagers are aware of the indirect benefits, generating a need to protect and conserve the public forest. The scenario of the relationship between villager and the Donparpoa public forest is presented in Fig. 3.

#### Perception of Public Forest Management of villagers:

The local government has made a pond in a public area close to Donparpoa and in 2015 the Nongsang local government gave notice that the Donparpoa public forest was to become a conservation area under the Plant Genetic Conservation Project under the Royal initiative of Her Royal Highness Princess Maha Chakri Sirindhorn. When interviewing a Loadern villager it was found that they are not able to participate in public forest protection because that is a function of government officer. Villagers can, however, support the local government or central government if the government organization wants to them to join with conservation or protection activity.

**Strategy of household to utilizing Donparpoa:** At present most households in the Loadern village follow global and social development trends (World dynamic) and so, villager's use of the forest is decreasing because villagers simply do not use the resources of the public forest. The livelihood of villagers is dependent on occupations which support their households and nowadays more villagers work outside the village (economic stress) and so their lives are not related to the Donparpoa public forest and incidentally the villagers think, as a consequence of the public forest management by local government (Government function) that the forest does not belong to them. However, the Donparpoa public forest remains important to the community because its area for collecting plant species, CO<sub>2</sub> absorption, O<sub>2</sub> production and protection from climate change, etc. In the mind of the villagers the emphasis of Donparpoa is as an indirect benefit to all, so, a possible process for recovering the relationship between villagers and the forest is by developing emphasis on natural resources which the villager's participation in the public forest protection and conservation can efficiently manage.

#### Guideline for Donparpoa public forest conservation:

The study found a relation gap between Donparpoa and villagers in the community. Normally the livelihood of villager does not utilize the Donparpoa public forest but there remains a feeling that the public forest is a heritage of the community and its indirect benefit should be conserved. However, the local government has a major organization to manage the area which should develop processes as follows.

The local government should set up participation processing between local government and villager in Loadern village for improving planning for public forest utilization or protection. The local government must make it clear to the villager in Loadern village that they are the owners of Donparpoa public forest.

The local government and community must develop plans for public forest management because at present the Donparpoa public forest not have a plan for managing the forest.



Develop Donparpoa public forest as an environmental learning center for local students of the community where majorly they will be enlightened about forest and local plant species. The local government develops the Donparpoa public area as a park for recreation of villagers in their free time.

### CONCLUSION

The study found that in previous times villager used Donparpoa Public Forest as an animal raising area, so the area of the public forest can be generally described as an agriculture area. At present the occupation of villagers in the community is changing from agriculture inside community to that of going to work outside the village with the effect from no longer raising animals being that the villagers no longer use Donparpoa public forest. As Loadern village is close to Khao Yai national park when villagers need to gather natural foods they tend to visit the national park but after 1994 there is no entry to the national park for collecting food with the effect being that villagers buy forest products from the local market.

However, in the household strategy of villagers, adaptation has followed socialization and world development such as agriculture sectors decreasing, labour moving, livelihood change, household occupation change etc. When considered in relation to household villagers near Donparpoa public forest this can explain why villagers do not use the Donparpoa but Donparpoa is a heritage and property of the village from their ancestors and villagers have awareness of the indirect benefit from forests in environment protection.

The recommendation in the study is that the local government should to empower the villagers with participation in public forest management and protection because at present the villager do not participation with the management public forest and develop the Donparpoa area as a local learning area for students and villagers go to learning with natural resources in their locality.

### LIMITATIONS

The livelihoods of villagers in the village found they will go to work outside the village early in the morning and come back in the evening, so collection of data in the daytime was difficult. However, the individual interviews suitable for collecting data were the result of appointments made with a villagers on holiday which solved the problem.

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