

**Analysis from Sustainable Livelihood Framework: Farmers' Choice  
of Elephant Foot Yam in Chin State**

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**Abstract**

Shifting cultivation based livelihoods are increasing vulnerability to food insecurity as it can no longer support or give rural farmers their means to survive amidst social and economic competition. With the decline in productivity of traditional crops along with rapid inflation, conversion of crops into money is almost impossible for rural farmers and their traditional crops like bean, millets, maize, and rice cannot feed them until the next harvest. As such, the farmers have had to engage in diverse activities for survival, meaning there is an urgent need therefore to improve the livelihood of the people through alternative modes of income generation and many farmers strive to move away from cultivating traditional crops to cash-crop plantation. As such, new varieties of cash crops were introduced in Chin state. One of the best choices for farmers is elephant foot yam. Compared to others, this crop is most promising to the farmers in Chin state. Some have successfully grown and commercialized, and adopted it as their main source of income within a short period of time. This article investigates the impact of the emerging cash crop known as elephant foot yam on the rural livelihood in Chin state, Myanmar. This article uses the sustainable livelihood framework to evaluate the impacts of growing elephant foot yam in Chin State, Myanmar. This paper argues that growing this crop has improved the livelihood of farmers.

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## I. Introduction

Myanmar, once known as ‘rice bowl of Asia’, has had a poor performance in agriculture after the introduction of ‘Burmese way to socialism’ (1962-1988). This period of socialism was known as exploitation on agriculture with heavy emphasis on rice production and centrally controlled price of rice. But even after liberalization of market system, the government continued to control the productivity of farmers (Fujita and Okamoto, 2006). Though Myanmar has been self-sufficient in rice production, people living in hilly areas could not have enough access to food. Moreover, poor infrastructure like roads, also affect the access of those in rural areas. Such is the situation in the Chin state which lies in western part of Myanmar.

According to United Nation Development Program, the Chin state is called the poorest of all the states and regions in Myanmar. The World Bank also reported that it is the poorest state in Myanmar, with a poverty rate of more than 70 percent (WB, 2014). It shares borders with India and Bangladesh as well as with Rakhine State and Sagaing and Magway regions. The estimated population is 478,690 according to census conducted by the government of Myanmar in 2014. Resources are limited and shifting cultivation has been the main source of food for the Chin people since time immemorial. The current shifting cultivation system is not recognised by law. In the words of Macqueen, it is branded “cultivable wasteland.” Such lands can be appropriated by the state or transferred to distant investors. In contrast “community forestry” secures a formally recognised 30 year land lease arrangement for which Chin communities can apply to secure their heritage (Macqueen, 2013). Moreover, the shifting cultivation due to increase of population and land erosion, the land can no more provide the food sufficiently.

Upland rice is grown through shifting cultivation system and most farmers do not apply chemical fertilizer. Yield rates are as low as 20 basket per acre for upland rice and 40-60 baskets per acre for irrigated rice. While majority of farmers have access to freehold lands, some extended families have difficulties in finding land to cultivate. The approximate average of food self-sufficiency levels for most farmers is 6-8 months, ranging from a minimum of 3 months to a maximum of 12 months. Now there is a growing trend that many upland rice farmers tend to shift from rice cultivation to EFY growing (Arr Yone Oo and TGH, 2014).

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Apart from shifting cultivation, the people also breed livestock and hunt for their other nutrition. However, with the passage of time and socio-economic-political the engagement of people in agricultural system was forced to change to meet the end needs of the people. Even though the permanent cultivation like terrace system and garden can be found in every village, large population still practices shifting cultivation to supplement their need. The developments of agriculture systems did not just take place out of nothing. It has forces behind the curtain that necessitated the farmers to move from shifting to permanent cultivation. At the same time, the continuous practice, in spite of its shortcomings and uncertainty of product from shifting cultivation has to be taken into consideration. Recently, a large number of people in Chin state have come to grow elephant foot yam despite the efforts of the Myanmar government forcing people to opt for paddy field for permanent cultivation. The yam has potential to fulfill both farmers and government desire to develop permanent cultivation with maximum profit to the farmers in return. Thus, it is known as cash crop. But it is not the farmers' intention to develop permanent cultivation, a means with which they can earn money to fulfill household's needs. Today, some no longer cultivate neither shifting nor terrace but they are never free from agricultural activities. One way or another, everybody still engages in it like wet-season gardening. Thus, it has become way of life and cultural activities. Small garden within household area called home garden is common practice. Such practices are never considered to be part of livelihood activity, rather people consider only paid job as work.

## II. Elephant Foot Yam and Other Plantations for Sustainable Livelihood in Chin State

Elephant foot yam, its biological name being *Amorphophallus paeoniifolius*, is a tropical tuber crop found in the tropical countries as a cash crop. It is a crop of Southeast Asian origin. It grows in many Southeast Asia countries and in India. Many indigenous ayurvedic and unani medicinal preparations are also made using its tubers. The tubers are believed to have blood purifying characteristics and are used in medicines for the treatment of piles, asthma, dysentery and other abdominal disorders (Srinivas and Ramanathan, 2005). In Myanmar, it is called as *Wa U*. It was not cultivated and consumed until the Chinese trader discovered it in Chin State. But it was naturally grown in the forest. Not long after discovery, farmers began to

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domesticate the crop based on their own capacity. And it is the first choice of farmers to domesticate for permanent cultivation in the Southern Chin State.

Before and after domestication of the crop commercial, there were many efforts and plants that the government of Myanmar initiated to create sustainable and beneficial permanent cultivation; it includes plantation of coffee, tea and *jatropha*. First, in an effort to create a permanent system of cultivation, the Government of Myanmar commenced a major nation-wide coffee planting program. New varieties were introduced. But the seeds were introduced in the Chin State without any success (Winston, 2005). Second, the government again initiated the tea plantation project which required every household to plant tea whether they want it or not, the military government forced every household to buy saplings at the rate of MYK25 (1 USD= MYK978) in earlier 2000. Third, along tea plantation in 2008, the people were forced to plant *jatropha* in their farm. According to the order, the villagers are responsible for purchasing the seed of *jatropha* from local authorities at MYK6,000 per one kilogram. Those failing to comply with the order are fined MYK10,000 or face imprisonment (CHRO, 2008). None of the government programs was ever realized practically.

With the introduction of elephant foot yam in Chin state, every stakeholder's eyes caught hold on it. Around 1993-1994, this valuable crop was made known to the Chin state. However, the plantation of elephant foot yam domestically for commercial purpose just started ten years ago. However, Arr Yone Oo and Triangle Generation Humanitaire (Non-Governmental Organizations) identify the crop as potential cash crop for poor farmers in most parts of Chin State. And 80 percent of total supplies in Myanmar came from Chin State. This crop is naturally grown in the forest. Sixty percent of the crop still comes from the forest. However, due to lack of support from the government, the majority of famers are unable to grow it domestically like other crops- rice, beans, and millets. As the number of people who collects the crop in the forest, domestic plantation also continues to increase and the demand and the price as well. The domestication of the elephant foot yam is mostly found in the southern part of Chin state namely Matupi, Mindat, Rezua, Paletwa and Kanpalet townships. It can be rightly argued that not the people in Chin state are farmers but at the same time, most of the villages grow elephant foot yam, be it in large forest areas or home garden for their extra income. Those who do not grow

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are the family composed of elderly people, unhealthy and those who serve as in the government services.

The method of plantation of elephant foot yam is not so different from those crops grown in the shifting cultivation. It also requires large areas of vegetation should be slashed to burn. But unlike the latter, it does not require cutting down all the trees since the former is likely to grow cold soil more and bigger than warm places. While shifting cultivation is criticized for deforestation, soil degradation and other environmental impacts, the plantation of the crop does not require moving from one place to another every year. The method of plantation is almost the same with shifting cultivation. Unlike shifting cultivation, the farmers first searched the small seeds in the forest in the raining season and stored it in their home. And the seed is sown at the end of May. The farmers do not need to shift every year. The burning of forest is done only once. The cleaning of the weed and nurturing is done only thrice in a year in contrast to shifting cultivation which requires almost every day. There is no need to build a hut in the cultivation as the farms are located near the town, the lengthiest would be around 2 to 4 miles. Long term fencing is necessary. There are three methods of collecting and saving the seeds;

- a. the farmers have to search the small plants in the rivers bank.
- b. the seeds that is found in the flowers
- c. the leaves also bear the seeds.

Most of existing growers now try to overcome the problem of seed supply by expanding their EFY farm little by little year after year so to make themselves self-sufficient in terms of seed supply through their own crops (AYO-TGH, 2014). Unlike terrace system of cultivation which requires a lot of inputs to make one, farmers find the plantation of the elephant foot yam more familiar and easier due to cultural practice of shifting cultivation. In the mean time, the famers who only grow the yam can also engage in other income generating activities.

Like shifting cultivation, the farmers just need a few inputs. The first one is to have land where the farmers can cultivate the crop and other tools like knife and edge for cutting down the vegetation and spade for plantation. Thus the farmers in Chin state considered the introduction of elephant foot yam as a blessing from mother earth. The broader advantage of Elephant Foot Yam cultivation is that it benefits from tree shade – thus providing a powerful incentive for farmers to maintain or plant trees. Like shade-grown coffee, this crop can lead to community forest restoration and management, says Macqueen (Macqueen, 2013).

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## III. Concept of Sustainable Livelihood in the Context

Chin state remains as the agriculture based livelihood activities of the people and so will be for the years to come. The majority of the people practices shifting cultivation. The increase of population and decline of soil fertility have threatened to bring food shortage and subsistence food. Lower yield of crop left most of the household next to starvation. Chin state is the poorest states and regions of Myanmar in terms of food accessibility, road infrastructure and health care. SL is a concept that analyzes the livelihood of people or individual based on the asset they have in their hand to improve their livelihood standard. SL framework is applicable to both urban and rural in regards to poverty reduction (Ellis, 1999). A livelihood consists of capability, assets and activities needed for a means of living (Scoones, 1998). While wide range of definition can be found, most of experts on SL quotes come from Chambers and Conway (1992).

A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks maintain or enhance its capabilities and assets, while not undermining the natural resource base.

Therefore, sustainable livelihood is not just about a means to gain livelihood but it also the means to be able to recover from a potential loss. In order to access how the elephant foot yam can impact the livelihood of people in Chin state, four indicators were analyzed in this paper: (a) Natural resource Asset, (b) Economics Assets, (c) Human Assets, and (c) Social Assets. These indicators however are not the only determinants for the success of livelihood strategies. There are other indicators that can be identified. However, all the available indicators, as of now, should be combined to investigate the livelihood of people regards to elephant foot yam in Chin state. It also offers important perspectives for looking at complex rural development questions (Scoones, 2009).

**Natural Resource Asset:** Natural Resource Asset is important for every living being, not just for human. In this paper, the natural asset of farmers represents the natural resources such land, the crop and environmental goods that are important factor for operation of elephant foot yam cultivation. The land is most crucial for the farmers around the world. As stated above, the land is most important inputs the farmers need; the Chin people's practice of land ownership is simple

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and harmonious. The lands are available to almost every farmers inherited from forefathers. Those of who do not own the land are often migrants from other villages or towns but they can approach the village council to grant them a piece of land which is use for a year of shifting cultivation or a land which does not have owner can be given to farmers who wants to grow elephant foot yam. The usable land in Chin state is 3 percent and present use of land is 1 percent only (OECD, 2013). While the Myanmar government's law on the right to land is complicated, the Chin state is defined as customary land. Therefore, the agricultural land for the plantation of elephant foot yam is available to almost everyone. And it is believed that like coffee and tea plantation, plantation of elephant foot yam can preserve the environment better than shifting cultivation practices. Moreover, the crop unlike any other crops is naturally grown and accessible and can be collected from the forest at no cost. Furthermore, the crops bear the seeds more than twenty times when it grows. But before the crop bears seeds, farmers have to wait for another one year. Most of farmers do not sell the seeds collected from the forest; they usually keep it for themselves.

**Economics Asset:** To assess the contribution of elephant foot yam in Chin state to economic growth is evaluated on inputs and outputs (how much farmers spend to produce the crop and how much they earn). However, the assessment of economics should depend on each individual. As mentioned in natural resource asset, most of farmers do not buy nor sell the seeds they collected from the forest. But there are some well-established farmers do buy the seeds from small farmers. Thus, it should not be relevant in terms of cash expenditure in purchase. The main expenditures are constituted by price of plantation and work force etc., the hour of work spends for plantation in the farm and collection of the seed in the forest. According to each individual's ability, some farmers depend on their own work forces- children and wife. And those who can afford would hire workers to cultivate the farms. And it should be taken to account if the work force used in this plantation are favorable than the existing or previous income generating activities. Only then it can reflect the economics assessment in elephant foot yam plantation in Chin state. Another important economic indicator is whether there are policies directed at attracting investments in elephant foot yam plantation and the establishment of an infrastructure.

**Human Asset:** In this paper, the human asset refers people's ability, skill, knowledge, capability with good health to cultivate elephant foot yam. If not all, a little has been done to relate shifting

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cultivation and elephant foot yam to health in Myanmar. Thus, it will be much relevant to evaluate the impact of elephant foot yam plantation to health related issues. It should be examined how many acres of land can be cultivated by a farmers alone, or if he is skillful in plantation in regards to elephant foot yam with a good health. The reason for it is primarily to reduce risks associated with elephant foot yam plantation and to find out the alternative for livelihood strategies by which the farmers can sustain his life. To analyze if human skills are improved or impacted negatively, it will be a necessary to analyze the educational process in which human skill transforms. The skill transformation takes place everyday however the bottom line is to improve the farmers' skill in agriculture in general and skill in plantation of elephant foot yam (Ladefoged and et al, 2009).

**Social Asset:** Chin society is communitarian society where the people have close relationship with nature and their neighbors. The nature of community indicates the relationship of their livelihood. Thus social asset represent the farmers participation and farmers' search for sustainable livelihood – how farmers acquires the land, how the community manage the farm land and how the land distributed among the farmers. These are institutional capacity, participation in decision-making processes in the planning and production, and the manner in which the knowledge of legal rights is strengthened (Ladefoged and et al, 2009).

### IV. Analysis of Result and Discussion

Even till today, the local people do not know the usefulness of the crop rather than selling them to Chinese and Japanese traders in Mandalay and Yangon. Some farmers also sell the crop in Pakkoku. But the price of the crop is not different in any place except in locality of the farmers. Today, it has gained a huge popularity in Myanmar generally and in Chin State particularly. It is said that the quality of elephant foot yam is not all same in Myanmar and the crop from Chin state is of high quality. Thus, the majority of the crop purchased in Myanmar comes from Chin State. And it is also slowly spreading to other places in Myanmar. The ability of Elephant foot yam to grow and be cultivated on marginal lands which are not normally used for agriculture is an advantage to the environment. Other environmental benefits are gained, as cultivation of elephant foot yam on abandoned agricultural, deforested or degraded land has the

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potential to improve the nutrient content of the soil and reduce erosion. Unlike lowland areas, the elephant foot yam in Chin state does not require water irrigation. The crop grows according to its seasons. Thus, only proper management of the farm is necessary to ensure that it grows well and big and it can boast the economy of Chin people at large. And the seeds can be grown at home gardens and forest for beginners.

With reorganization of customary law concerning the land, the farmers can make use of it to create better atmosphere improving degraded land. What is worrying trends is that possibility of large scale farming if every farmer started to grow like shifting cultivation, there is also an urgency to make law and regulation for the land as the elephant foot yam cultivators increase in number so to ensure that environments are not impacted negatively though accessibility of land is not an issue in Chin State.

While the economic growth by plantation of elephant foot yam cannot be accurately accessed, it can rightly be argued that elephant foot yam can generate twenties times higher than shifting cultivation. Compared to an income per acre of about USD215 to 320 for maize, the income per acre from Elephant Foot Yam can be anything between USD2,000 to 8,500 (Macqueen, 2013). In this farming, the farmers do not need lot of inputs like any other plantation, for example tea, coffee and terrace system of cultivation and the use of fertilizers is never known to the people. The inputs used in this plantation are the same as those used in shifting cultivation. And those who cannot afford for transportation can sell their products in local traders though in cheaper rate. However, the small scale farmers do not usually go to sell in Mandalay. And it is much better for them to deal with local traders as they do not have to go for tax payment which traders usually experienced at the hands of corrupt police officers. In some cases, the price is uncertain in Mandalay.

Again, the requirement of few tools only does not mean that farmers are well-off to start their elephant foot yam. They still have to work for their food in shifting cultivation at present. And large numbers of farmers are in need of financial assistance to improve their livelihood. It is important that small scale farmers are prioritized to have their own farm permanently.

There is no specific health issues involved in elephant foot yam plantation as it is in shifting cultivation, one of the main disease related will be malaria which people usually

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experienced during farming due to mosquitoes. Effective precaution has to be taken. But growth in income would mean a better access to health as well. And one of the advantages the farmers have in this plantation is they do not need new knowledge or training to grow elephant foot yam as it is similar to what they have been doing etc., shifting cultivation. They have been trained in this business of cultivation since their childhood. They are very much aware of the nature of farming. Having said that new technical outputs should not be discouraged for every individual has his own likes and dislikes of farming methods and soils are different from one place to another. The government of Myanmar has to provide the needed technical support.

The social asset refers to institution which mentioned above. The farmers' participation in decision-making is utmost important. And the institutions such as village council, state parliament and central government's receipt of farmers' voices are yet to be implemented. For example, the capacity building of farmers through formation of union can be helpful in bargaining of the price for their products. Farmers are uncertain as to how long their product will be in demand. Thus, negotiation is necessary. In most of the case in Myanmar, the farmers' choice are not given, their life are dictated by the government. Worst of all, the government has never a clear policy on agriculture in Chin state.

### **V. Recommendations**

1. It is important that farmers are empowered to acknowledge other alternative income generating source. The sale of the seed by small scale farmers have to be critically evaluated to make sure that they can think for long run benefit.
2. Formation of farmers' union for those who plant elephant foot yam is crucial important to bargaining. Though some farmers have formed the union in some places, it will be better union if at state level for farmers' interest.
3. The village or township council should not hesitate to take actions farmers whose use of land is inappropriate. For example, some farmers cultivate the elephant foot yam near watershed. It may impact negatively on the whole local people.
4. The government should grant load to the farmers who wants to plant elephant foot yam for long run. The government has to come up with a clear policy on agriculture especially

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on elephant foot yam so that this policy could be implemented to the interest of the farmers. And the interference in the lives of the farmers should be avoided such dictating what the farmers should not do or do. But this is the responsibility of the government to see the interest of the people.

5. Technical assistance should be given to the farmers such as training on legal rights and transparency on the policy.

### **VI. Conclusion**

First of all, the paper explains the livelihood and daily activities of Chin farmers in Chin State, Myanmar. The main source for food is shifting cultivation also known as ‘slash and burn’ cultivation. Besides shifting cultivation, the people also breed livestock for themselves. Since the shifting cultivation cannot provide food security anymore, the farmers have to find alternative means of earning to feed themselves. On the other hand, the government of Myanmar also introduces more permanent cultivation like coffee and tea. But it was done by force labor. To their fortune, the farmers discovered the value of elephant foot yam when the Chinese traders commercialized it. Secondly, the paper draws insights to analyse the choice of farmers etc., elephant foot yam from sustainable livelihood framework. And the analysis was based on four indicators of livelihood. It is not a means to provide solutions but rather to provide Chin rural farmers’ livelihood better understanding on how the rural farmers in Chin state improve their lives and what are the challenges they face in relation to growing of elephant foot yam. Finally, the contextual analysis is made through the given four lenses of indicators. While it can also preserve the forest, it can provide livelihood diversification as it does not require working like in shifting cultivation. And in comparison to shifting cultivation, the elephant foot yam generates better incomes. The plantation of elephant foot yam, though improves the lives of the people, is still limited due to limited resources like financial supports. Farmers’ knowledge on government policy is not satisfactory, and their rights are deprived in many ways due to lack of education. Along with the growing trends in economy, the government has to ensure that worrying trends are also met with precaution. This could be done through farmers’ participation and empowerment. The paper concluded with five important recommendations.

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