

Status of Bodichitta (*Ziziphus buddhensis*) Cultivation and Its Prospects in Nepal

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Authors' contributions

This work was carried out in collaboration between all authors. Authors NU and KST were responsible for data collection and entry. Author HN did the data analysis and report writing was assisted by author JJG. All the authors were involved in Manuscript preparation. All authors read and affirmed the last original manuscript.

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ABSTRACT

Bodichitta (*Ziziphus buddhensis*) is a religious plant, the seeds of which are used for meditation purpose. It is different from *Zizipus* species found in other countries in context of physical characteristics or its habitat requirement, however, there is some resemblance in physical characteristics with *Ziziphus montana* found in China. A survey study was carried out purposively in selected sites near the Timal village where cultivation of Bodichitta was at commercial as well as subsistence scale. Questionnaire interview was performed on 62 farmers along with the key informants' interview. The key informants included traders, local leaders and development workers of the region. A transect walk was made across the village to assess the physical situation. The study results showed that this plant species has changed the life of people in the villages namely Timal, Kirtas, Salleni, Pepta, Kharpachowk of Kavre district of Nepal through drastic change in their income. The rise in value of Bodichitta increased the income of the farmers and mean increase per

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plant per season was found to NRs. 269728.78. Regression analysis shows that factors affecting log of average income include number of female members of the family, type of cultivation and number of fruiting plants. The farmers expressed their satisfaction with the income through Bodichitta cultivation. They also suggest the youth to be involved in the cultivation and business related to Bodichitta, however, farmers report that they lack trainings and support from government or non-government sectors. The result shows the need of training and information access to the farmers regarding production and marketing of Bodichitta so as to extend its cultivation and generate income in a sustainable basis.

Keywords: Bodichitta; Buddhists; religious value; market expansion.

ABBREVIATIONS

ANOVA : Analysis of Variance
CBO : Community Based Organization
DADO : District agriculture development office
KII : Key informant interview
MS Excel : Microsoft Excel
NGO : Non-government Organization
SPSS : Statistical Product and Service Solutions
VDC : Village Development Committee
VIF : Variance Inflation Factor

1. BACKGROUND

Bodichitta (*Ziziphus buddhensis*) is a plant with high religious value whose seeds are highly recognized for meditation [1]. 'Bodhi' is the Sanskrit word for 'enlightenment', and 'chitta' the word for 'mind'; therefore 'Bodhichitta' literally means 'mind of enlightenment' this is defined as a mind, motivated by compassion for all living beings that spontaneously seeks enlightenment [2]. The name Bodhichitta was chosen for the plants because the seeds of the plant were supposed to be used by Lord Buddha and their disciples using beads of Bodhichitta as garland. It is believed that the Shakyamuni, a sage of the Shakyas, left behind three plants in Lumbini, Namobudhha, and the Timal region of Kavrepalanchok, but only the plant in Timal region survived. Some also say that Guru Rinpoche came to meditate in Kavre and left a tree behind looking the devastating poverty in the villages of Timal. After completing his Retreat meditation at the cave of Tongsum Kunda (Kavre District of Nepal), he thought of bringing peace, happiness and prosperity of the people of Kavre District with the introduction of Boddha Chitta tree. He thought for a material way of support for the local people of Timal, Kavre District as a return of their kindness and hospitality [3]. There is a story about Padmasambhava, the lotus-born Guru Rinpoche, who promoted Buddhism in Tibet during the 8th century and came to meditate in Kavre and left a tree behind [3].

According to Bhattarai and Pathak [4], this Bodichitta is a botanically named as *Ziziphus buddhensis* which is clearly different from other species of *Ziziphus*. It did not match with the *Ziziphus* species reported from India, Pakistan, Bhutan, Bangladesh in either physical characteristics or its habitat requirement [5], however, there is some resemblance in physical characteristics with *Ziziphus montana* found in China [6]. Bodichitta, being a perennial plant preferred by the farmers of study area, it establishes a good example for agroforestry system. The farmers of Nepal have been involved in agroforestry systems which involve agricultural crops, trees, and livestock, with some variations across geographic belts [7]. In this context, Farmers of Kavrepalanchowk district have been practicing the plantation of Bodichitta plants in their farms which is important not only for livestock and human edible parts but also pertains a great influence in the religion believe. The fruits of *Ziziphus buddhensis* are edible and prefer by the people living in Kavre district. The leaves of the tree are highly nutritious and used as fodder for cattle [8].

It is reported that the value rise of Bodhichitta has been a source of people for earning livelihood. A drastic change in the people in the study area was due to the knowledge about cultivation of Bodhichitta, a plant with high religious value whose seeds are highly recognized for meditation [1]. All that changed in the late 1990s, when Buddhists began to use the beads for chanting and they became a fashionable way to show off wealth, he says. In some cases, the beads are used in necklaces, bangles or bracelets [1]. It has dramatically improved the livelihood of villagers in Singata and the rest of the Timal area since 2011, when traders from Kathmandu, as well as India and China, visited there to buy the seeds of Bodichitta [9].



Fig. 1. Plant, fruiting plant, and seed of Bodichitta

The plantation of trees is also in harmony with the ecosystem and hence sustainable. An integrated approach involving plantation of high value crops is required to ensure the sustainability of farming, exemplified in the Kavrepalanchowk district. As Bodichitta is reported to be providing a good source of income for the farmers, there is ample scope and opportunity for sector to be improved and sustained in collaboration with government agencies, non-government organizations (NGOs) and community based organizations (CBOs) to initiate or support local participatory development, research or training program in areas related to Boddhichitta cultivation. Thus, the present study was conducted to develop Boddhichitta cultivation in that particular area by making proper assessment of the factors affecting and the different aspects that are being affected by this so that better livelihood of people could be ensured. The study was carried with the purpose to assess the effect of its cultivation on the socioeconomic status of farmers of the region and probe the probability of the future expansion of its cultivation.

1.1 Description of Study Area

Kavrepalanchowk is one of the districts of Bagmati zone of central development region covering an area of 1396 km². The region is situated about 30 kms from Kathmandu on BP highway and Araniko highway and 74 kms from Kodari. The place is well known for its natural diversity and many heritages. Beautiful Rivers like Indrawati, Bhotekoshi and Sunkoshi flow within the territory of this district. This district lies in the frontline for vegetable cultivation. Kavrepalanchowk is a district of huge diversity, diversity in terms of physical environment. The district varies in the development aspect of

physical infrastructure. Some parts of Kavre are booming in development whereas some parts are facing the problems of hunger. The study concentrates for some villages like Timal, Kirtas, Salleni, Pepta, Kharpachowk of this district located almost 50 kilometers from Kathmandu where People demonstrate a distinct lifestyle with the devotion for Buddhism [9]. These places are still in primary phase of the development as they are completely surrounded by rugged topography. Many places of these regions are still devoid of appropriate access of education. Most of the people here practice traditional form of agriculture which does not produce enough for them to sustain their livelihood in easy way. The rural farming is dominated by subsistence nature especially for the areas that are 20-30 kilometers (km) away from the Kathmandu Valley. Many resource-poor farmers in the rural hills are continuing traditional farming systems for subsistence production [10]. This subsistence farming has caused low economic development which needs to be addressed through identification of site-specific and situation demanding production system. Agriculture in the form of high value crop cultivation is gaining momentum due to tremendous demand in market and allied fields to derive benefits from more than one method of farming practices but the concern for natural resources depletion, labour shortages, fallow land, gender-based conflicts and institutional limitations cannot be ignored. Nepal, having an advantage due to topography and climatic variation, maximization of returns from land is best ensured by identifying and exploring those resources in terms of high value crops, adopting commercial cultivation and their efficient market practices but still there is lack of identification and exploration of scope of many of such crops.

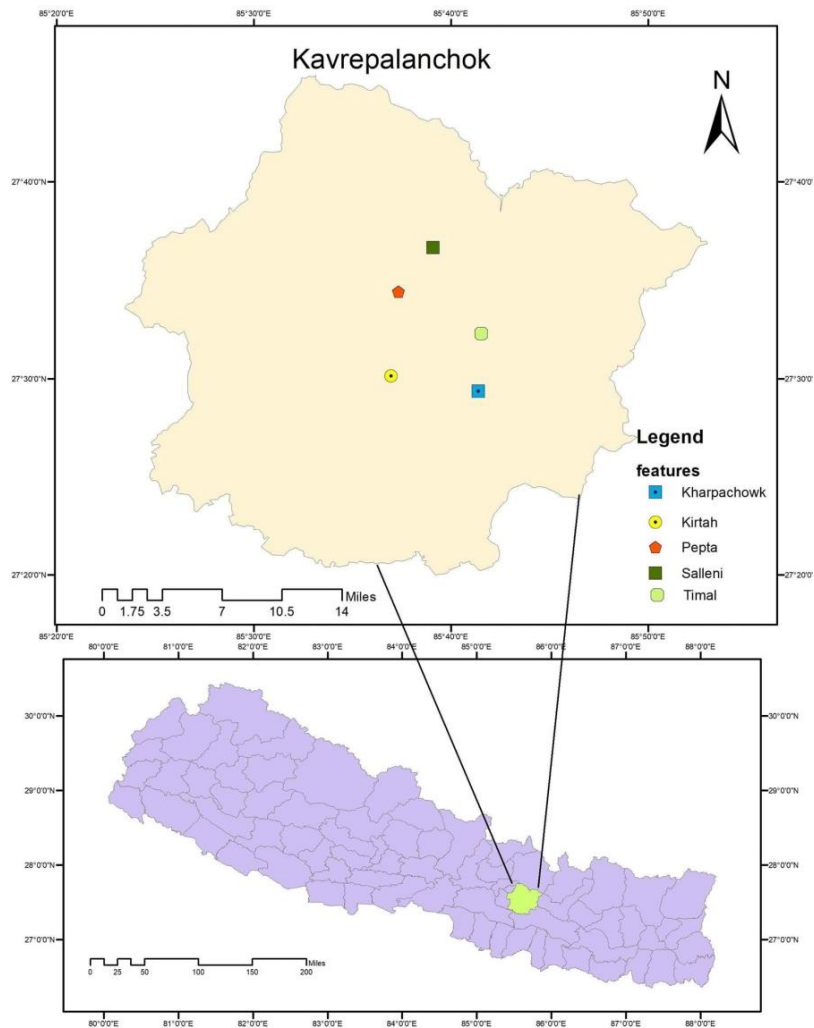


Fig. 2. Study site

2. METHODS

The study aims to assess the status of Bodhichitta cultivation, its effect on the farmers and its prospects for future expansion of production and marketing.

2.1 Selection of Study Area

The site was purposively selected as the Timal village and other peripheral villages where Bodhichitta is cultivated both in sustainable and commercial scale. The villages surveyed were Timal, Kirtas, Bhakundebesi, Narke, pepta salleni and Mangaltar. Mainly the respondents were selected from the Timal as the place is the centre of origin of Bodhichitta and more farmers of that place were involved in the cultivation of the

Bodhichitta cultivation. Other villages were selected on the basis of the recommendation of the District agriculture development office (DADO) in Kavrepalanchowk.

2.2 Source of Data Collection

Household interview was performed with 62 farmers whose data was collected through a designed questionnaire whereby information regarding the socioeconomic characteristics of respondents and farming experiences of Bodhichitta was collected. Key informant interview (KII) was performed by using a check list. Key informants were selected from almost all the villages based on the view of local people. We also interviewed some monks to know the religious values of Bodhichitta and also to figure

out the history behind Bodichitta. A transect walk was made with the help of a local guide across the villages to assess the real scenario of those villages. During transect walk we made informal information collection via informal talks with the farmers, owner of nursery, non-cultivating farmers and other required persons related to the Bodichitta business.

Because of lack of sufficient study on this aspect, the secondary data are mainly comprised of documentaries, newspaper articles and reports/records of Village Development Committee (VDC).

2.3 Methods and Techniques of Data Analysis

For data entry and analysis, the software SPSS (Statistical Product and Service Solutions, an IBM product [11] and MS Excel were used. The socio-demographic and farm characteristics like family size, sex, age, occupation, education level, size of land holding, earning from agriculture and Bodichitta, etc were assessed. Linear regression model was used to identify the factors affecting average income from bodichitta cultivation. The model includes:

$$LnayY (\log \text{ of average income form bodichitta}) = \beta_0 + \beta_1 x_i$$

Where,

$$\begin{aligned} LnayY &= \log \text{ of average income form bodichitta} \\ \beta_0 &= y \text{ intercept} \\ \beta_1 &= \text{coefficient for factors} \\ x_i &= \text{variables affecting log of average} \\ &\quad \text{income from bodichitta; } i= 1 \text{ to } n \end{aligned}$$

3. RESULTS AND DISCUSSION

3.1 Socioeconomic Characteristics of the Population

The socioeconomic characters of the population as shown in Table 1 constitute of 87.1% male members as household head. Since the findings show the involvement of female members form all the households in cultivation of Bodichitta while there was only half of them who reported the involvement of males. This shows that Bodichitta can be a good source of employment for the females of the area and can upturn their contribution in household decision. All the families were Buddhists as per their religion which is a significant reason for popularity of

Bodichitta in this region. Primary occupation of all of them was agriculture and majority of them had no other source of income which creates scope for expansion of Bodichitta cultivation and assist farmers to establish Bodichitta cultivation as a sustainable source of income. Only 19.4 percent were involved in business and 38.7% in other sectors like government and nongovernment organizations. 12.9% of the household heads had higher education and 43.5% of the farmers in the area were found to be illiterate and there was no trainings or support for Bodichitta cultivation, this signifies requirement for special training package in the area. The highest level of education of family members was higher education with 53.2% of the population.

Among the surveyed sample only 35.5 percent were involved in farmer's group. Almost all the respondents belong to Janjati caste and were Buddhists by religion.

3.2 Status of Farming

Among the farmers 95.2% were cultivating in upland while only 3.2% were cultivating in lowland and only 1.6% in both upland and lowland. Source of sapling for 77.4 percent of respondents was market while rest prepared their sapling themselves. 83.9% of the respondents reported the incidence of insects and disease in Bodichitta. 91.9% of the farmers thought that it could be a good occupation for the youth to earn better livelihood. All the respondents reported the involvement of female members of the family while in only 50 percent of the household's male members were involved actively in Bodichitta farming. More than half of the respondents said that there was no change in migration of youth after exploration of scope of Bodichitta while slightly less than one fourth reported that the migration was decreased and rest reported the increased migration.

All the farmers realize that their economic standard has been improved since they have started to sell the seeds of Bodichitta. The farmers' mean average income from per Bodichitta plant income before the rise of value was NRs. 21,752.1260. While after the rise, it was NRs. 291,480.9071. Therefore, the difference between average incomes per plant was found to be NRs. 269,728.7811. Farmers state that there was no trainings and support regarding Bodichitta cultivation and its improvement. Key informants report that farmers have to pay tax for selling their product but there

are no programs by the government for improvement of cultivation and appropriate market access of the farmers which means that a large share of market margin was still enjoyed by the traders/middlemen. The traders responded that there was enough scope for export of beads of Bodichitta to China, Srilanka, Thailand and Vietnam and the demand is much higher than the current supply. The traders further explained that the rosaries were either used for meditation or decorating walls of monasteries and statues. The seeds, which were 7mm to 12 mm in size, were old as prayer beads, those larger than 15mm were used for decorative purposes.

The Literature shows that Bodhichitta cultivation seems like a lottery for the farmers for which they invested very less and instead earned millions unexpectedly. Legend has it that Buddha lost two Bodhichitta beads out of 109 when he was counting prayers, Sonam Lama says. Later, Buddha found one of the beads that he had lost, but the chain snapped again and beads were scattered around. The Bodhichitta trees started to grow after he sowed those beads in the village and blessed them Farmers were not aware of the value of the Bodhichitta fruit, which is used

by Buddhists for religious purposes, when they first planted some trees about 30 years ago [12]. This is more like effortless farming where both subsistence and commercial farmers earned a lot. Farmers have been able to earn NRs 2.9 million by selling half a sack of Bodhichitta fruits [12]. The advantage of the Bodhichitta cultivation was mostly taken by the early adopters rather than others because soon after the identification of its utility the high demand and limited supply led to higher price. As prices of the beads grew, locals from Timal village took samples of this tree species to the Kathmandu-based government herbarium centre in 2013. A team led by botanist Khem Raj Bhattarai visited the site multiple times and found that this species of the ziziphus did not match those found in India, Bhutan, Bangladesh, China or any other part of Nepal. The new species has now been named Ziziphus budhensis, and its discovery was published in the Indian Journal of Plant Sciences [9].

A local farmers have been earning millions of rupees from the fruit annually and its demand has been growing rapidly [12]. The price of the Bodhichitta plant varies from one trader to another. Natural Bodhichitta has priced

Table 1. Socioeconomic characteristics of respondents

Characteristics	Frequency	Percentage
Gender of household head		
Male	54	87.1
Female	8	12.9
Age category of household head		
Below 30 years	9	14.5
30 to 60 years	35	56.5
Above 60 years	18	29.0
Primary Occupation of the family		
Agriculture	62	100.0
secondary occupation of the family		
Abroad	12	19.4
None	26	41.9
Others	24	38.7
Education of household head		
Illiterate	27	43.5
Up to secondary level	27	43.5
Higher education	8	12.9
highest education in the family		
Illiterate	5	8.1
Up to secondary	11	17.7
SLC	13	21.0
Higher education	33	53.2
involvement in farmers group		
Yes	22	35.5
No	40	64.5

Source: Field Survey: 2017

one-year-old plant at Rs 1,250 and six-month-old plant at NRs 950 [3]. The characteristics of beads are also the reason for price differences. According to farmers, many of the fruits have six facet and fruit with six facets is considered valuable and costs up to NRs 100,000 apiece [12]. Smaller seeds are more highly prized than larger ones. A pathi (3.2 – 3.6 Kgs) of Bodhichitta growing in Kavre costs 25 lakhs. The rate of 3-7 faced beads ranges from Rs. 400 – 600,000. Similarly, the rate of 2 faced beads depends upon its size; 7 mm size mala made up of 108 beads cost Rs. 6 lakhs and the price reduces at its increasing size [8]. The cultivation of best quality of this particular species in only specific areas creates scope for the earnings for the farmers of that region. In the Timal region of Kavrepalanchowk, the trade in Bodhichitta is worth Rs1 billion a year, and farmers can earn hundreds of thousands of rupees from a single tree [13].

The beads originating in Nepal are in high demand because they are considered to have high quality. "The demand for Bodhichitta has swelled substantially and so have the prices," said Lapsang Lama, owner of Natural Budhha Chitta, manufacturer and exporter. "The market has grown by 25 percent and the annual revenue has increased from Rs20 million to Rs30 million this year" [3]. Dalai Lama identified the beads of Bodichitta from Nepal to be of best quality [14]. It is reported that beads from this region became popular in 2011 after the Dalai Lama, the spiritual leader of the Tibetan people, praised their quality and encouraged people to use the bead chains in meditation [1]. In the Timal region of Kavrepalanchowk, the trade in Bodhichitta is worth Rs1 billion a year, and farmers can earn hundreds of thousands of rupees from a single tree [13]. There is enough scope for increased production because of its export possibilities. Chinese online marketplace Alibaba has enlisted 15 prominent suppliers from Nepal who export Bodhichitta beads to major markets of Taiwan, China, South Korea, Japan, Sri Lanka and the US, among other countries, where Buddhism has flourished as a way of life. The beads, depending on the purpose, have been priced from \$5 to as high as \$4500 on alibaba.com. "Moreover, even exporters from China have set up offices in Thamel to transport the seeds to China. They are purchasing the seeds directly from farmers based in Timal, Kavre [3].

The study shows that there is a significant effect of years of cultivation, source of sapling and

manuring practice on the income generated from bodhichitta where the effect of female involvement does not seem to be significant. Many farmers were found to be associated with the farmer's group but no significant change was seen either in case of Bodhichitta or in the case of agriculture. If the proper marketing link is connected with the foreign Buddhist communities the business seems to have possibility to expand in future market. Buddhist prayer beads are a customary tool used to count the number of times a mantra/ Buddha quotes [15]. Although there was good participation of females in the cultivation, the effect on average income was not found to be significant. Therefore, trainings and skill development seems to be important for the female of the area. The average income per plant for the commercial farmer was found to be lower than those of subsistence farmers, which might be because the commercial producers are either not able to manage farm well or they are selling at low price as they need to sell in bulk. It signifies the necessity of training package for production practices as well as appropriate market information for the farmers. Moreover since most of the subsistence farmers are interested to extend their farming they need to be supported in the form of financial as well as social capital. The regression shows that the average income per plant decreases with the increased number of fruiting plant which signifies that the farmers are not able to manage the larger number of plants. All these conditions show that there is need of support for the Bodichitta growers.

Since there was no formal study for the market of Bodichitta, its demand needs to be assessed for creation of more market. It is reported that the beads are flown out to China, and then sent to areas like Tibet, or in Japan or Malaysia. "Information regarding market demand is not well documented [9]. Farmers in Nepal have been earning millions of rupees annually from the fruit of the tree, which blooms in April and is harvested in August. The farmers can sell a rosary of Bodhichitta for up to Rs5,000 (US\$48), while the same rosary can sell in Tibet for NRs100,000–150,000 [13].

Market exploration in parallel to increased production is important for its continuous scope. If the exports fall because of higher production, the price of the beads will go down instantly [1].

Table 2. Hierarchical regression on log of average income per plant

	Variable	Unstandardized Coeff.	B	t	Sig of t	R	R2	ΔR2	F	Sig of F	VIF
Model 1		B (SE)				.099	.010	.010	.596	.443	
	Constant	24449.980 (4050.015)		6.037	.000						
	No. of male members	-653.387 (846.269)	-.099	-.772	.443						1.000
Model 2						.269	.072	.063		.109	
	Constant	27672.195 (4270.754)		6.479	.000						
	No. of male members	618.907 (1043.799)	.094	.593	.555						1.597
	number of the female member	-2060.723 (1033.539)	-.316	-1.994	.051						1.597
Model 3						.426	.181	.109	4.283	.008	
	Constant	42444.112 (6680.394)		6.354	.000						
	Number of male members	363.831 (993.222)	.055	.366	.715						1.611
	number of the female member	-1710.935 (987.307)	-.262	-1.733	.088						1.623
	Type of farming	-11895.637 (4280.472)	-.333	-2.779	.007						1.017
Model 4						.506	.256	.075	2.301	.002	
	Constant	40822.310 (6459.853)		6.319	.000						
	Number of male members	179.683 (958.224)	.027	.188	.852						1.621
	number of the female member	-1667.054 (949.614)	-.256	-1.756	.085						1.624
	Type of farming	-8475.494 (4357.653)	-.237	-1.945	.057						1.140
	Number of fruiting plants	-362.297 (151.496)	-.291	-2.391	.020						1.134

3.3 Hierarchical Multiple Regression for Factors Effecting Income from Bodichitta

Hierarchical Multiple Regression model was used to find the appropriate model based on primary data collected from a sample of 62 persons and has 4 variables. The sample size of 62 was deemed adequate for the number of independent variables to be tested [16]. The ratio of sample size versus independent variables fulfills the requirement of 15 samples for each variable [16]. The assumption of individuality was also met, the value of R showed that none of the independent variables (number of male members, number of the female member in the family, method of cultivation, number of fruiting plants) are highly correlated with each other. The value of variance inflation factor (VIF) is less than 10 and even less than 3 for all the variables which show that there was no multicollinearity [17].

A four stage Hierarchical Multiple Regression was conducted to examine the relationship between the set of independent variables. Collinearity statistics (i.e., Tolerance and VIF) were all within accepted limits, the assumption of multicollinearity was deemed to have been met [18]. Residual and scatter plots indicated the assumptions of normality, linearity and homoscedasticity were all satisfied [18,19].

Dependent variable: In of average income per plant, Dummy variable for type of cultivation: 0 subsistence and 1 commercial cultivation.

The four stages of calculations resulted with four models, whereby the fourth model has the highest R, R-Square, and F values. Model 4, with four predictor variables (number of male members, number of the female member, type of cultivation and number of fruiting plants), was the best, with an R of 0.506 and an R² of 0.256, thus 25.6 % of the variance had been accounted for, by the variations of the explanatory variables, the change in R² was highly significant $F(1,57) = 4.903$, $p < 0.001$, consequently log of average income from Bodichitta has been found to relate to the number of fruiting plants. The result form ANOVA showed that third and fourth models are significant at $P < 0.05$ and F value is increasing in each step from first to last models plants (3.290 and 3.726, respectively).

Table 2 reveals that there was a significant effect of type of cultivation and number of fruiting plants on the log of average income generated from Bodichitta where the effect of male and female members in the family did not seem to be significant. The effective model to describe the log of average income is, therefore:

The Model:

$$LnavY \text{ (average income from Bodichitta)} = \beta_0 + \beta_1 \text{ (number of male members)} + \beta_2 \text{ (number of female members)} + \beta_3 \text{ (type of farming)} + \beta_4 \text{ (number of fruiting plants)}$$

Where, $\beta_0, \beta_1, \beta_2, \beta_3$ and β_4 are respectively 40822.310, -1667.054, -8475.494 and -362.297, respectively.

The model with statistically significant variables include:

$$Lnav Y = 40822.310 - 8475.494 \text{ (Type of farming)} - 362.297 \text{ (No. of fruiting plants)}$$

(0.0000) (0.0570) (0.0200)

Where, the coefficient of the type of farming is statistically significant at 10% while the coefficient of the number of fruiting plants is statistically significant at 5%.

Future Scope:

According to the traders, the demand of Bodichitta is increasing and has sufficient scope of export to China, Vietnam, Srilanka and Thailand. Since the cultivation of this species has been found to be successful in these few regions, there is enough scope for the farmers to extend their cultivation.

3.4 Farmer's Plan to Expand for Future

A Cross tab for cultivation type and future plan (see Table 3) shows that most of the respondents who were doing subsistence farming were interested to expand their cultivation in future whereas fewer of the commercial cultivators were interested to expand. This reveals that the subsistence growers find the cultivation to be profitable whereas the most of the commercial cultivators might not be able to handle extended cultivation.

Table 3. Farmer’s plan for future extension

Farming type	Plan to extend in future		P value	Total n (%)
	Yes n (%)	No n (%)		
Subsistence	13 (50.0)	32 (88.9)	.001	45 (72.6)
Commercial	13 (50.0)	4(11.1)		17(27.4)

Source: Field Survey 2017

4. CONCLUSION AND RECOMMENDATIONS

This study assessed the status of Bodhichitta farming in Sindhupalchowk and perception of farmers regarding its cultivation scope. *Ziziphus budhensis* (Bodhichitta) is not only a religiously important but is also important for its significant difference with all other species and moreover, it is a plant of *Zizipus* which is clearly different than those found in India, Pakistan, Bhutan, Bangladesh. It is grown in some villages of Kavrepalanchowk (Kavre) district of Nepal and people cultivating this plant have been able to reap a good profit. In spite of this scope, there is lack of study and support on its cultivation. A household survey on the Bodichitta farmers showed its contribution to their income and a way of inclusion of the female members of the household. In spite of lack of any support from government or non-government organizations, the farmers are able to reap a good profit and are remarkable tax payer for the government. The incidence of disease and pest in the plants alarms for their management in time. Moreover, training for farmers and their exposure to the market might be a great step to motivate the farmers to cultivate it in more scientific and commercial way.

For creating more momentum in the field of Bodhichitta the cultivation should be participatory in terms of gender. Effective co-operatives for Bodhichitta should be started rather than inefficient farmer’s group existing in the villages. Government role should not be limited to the collection of tax, but the government should provide proper training and quality inputs for Bodhichitta cultivation. Government should connect probable tourist areas with at least road facilities to increase tourism in coming days.

AVAILABILITY OF DATA AND MATERIALS

The datasets generated and/or analyzed during the current study are not publicly available because of personal details of the households

but are available from the corresponding author on reasonable request.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

In this study, the authors considered all ethical issues and followed a number of steps in conducting interviews with research participants. From the outset, we were transparent about the objectives of the research and we informed the participants they could withdraw even in the middle of the interview. All participants who agreed to be involved in this study were assured complete confidentiality, anonymity, and privacy regarding their identity.

CONSENT FOR PUBLICATION

The key informants were taken consent for indication of their names while publication.

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COMPETING INTERESTS

The authors declare that they have no competing interests.

REFERENCES

1. Kandel YK. Nepalese farmers find livelihood in trees producing beads for Buddhist meditation; 2016 [cited 2018 May, 10]; Available: <https://globalpressjournal.com/as-ia/nepal/nepalese-farmers-find-livelihood->

- trees-producing-beads-buddhist-meditation/.
2. Lama L. A falling leaf; 2015. Available:<http://www.naturalbuddhachitta.com/buddhachittatree.php>
 3. Rijal P. Bodhichitta biz booms amid rising demand, in Kathmandu Post 2016, ekantipur: Kathmandu, Nepal.
 4. Bhattarai KR, Pathak ML. A new species of Ziziphus (Rhamnaceae) from Nepal Himalayas. Indian Journal of Plant Sciences. 2014;4(2):71-77.
 5. Bhandari M, Bhansali A. Flora of India (Oleaceae-Connaraceae). Vol. 2000, Calcutta, India Botanical Survey of India.
 6. Zao S. Flora of China: Ziziphus; 2007. Royal Botanic Garden Edinburg
 7. Garforth C, et al. Socioeconomic factors and agro-forestry improvements in the hills of Nepal. Mountain Research and Development. 1999;19(3):273-278.
 8. lokendra. Nepalese Earn millions of rupees by growing Buddha Chitta plants; 2016 [cited 2018 25 April]. Available:<http://www.thesocialmediatoday.com/nepalese-earn-millions-of-rupees-by-growing-buddha-chitta-plants/>.
 9. Bhusal R. Nepal's million dollar trees bring hope and fear. 2016 [cited 2018 May, 15]; Available:<https://www.thethirdpole.net/ne/2016/09/22/nepals-million-dollar-trees-bring-hope-and-fears/>
 10. Scialabba N. Opportunities and constraints of organic agriculture: A socioecological Analysis. Rome: FAO; 2000.
 11. Hejase A, Hejase H. Research methods: A practical approach for business students 2nd ed; 2013. Philadelphia, PA, : Masadir Inc.
 12. Bhatta TP. Farmers earn millions growing Bodhichitta, in The Kathmandu Post; 2015. ekantipur: Kathmandu.
 13. CL Farmers in Nepal see earning from Bodhichitta beads soar. 2015 [cited 2018 25 April]. Available:<https://www.buddhistdoor.net/news/farmers-in-nepal-see-earnings-from-bodhichitta-beads-soar>
 14. Chaudhary S. Buddha's Beads Fetch Millions for Farmers in Central Nepal. 2015 [cited 2018 25 April]; Available:<https://globalvoices.org/2015/08/06/buddhas-beads-fetch-millions-for-farmers-in-central-nepal/>
 15. Himalayan News Service, Man held with Rs. 6.1 million, prayer beads, in The Himalayan Times. 2015, Himalayan Times: Kathmandu.
 16. Tabachnick BG, Fidell LS. Using multivariate statistics. 4 ed. 2001, Boston: Allyn and Bacon.
 17. Coakes SJ. SPSS: Analysis without Anguish: Version 12.0 for Windows. Vol. 2005, Australia: John Wiley & Son Australia, Ltd.
 18. Hair JFJ, et al. Multivariate Data Analysis. 3rd ed; 1995. New York: Macmillan.
 19. Pallant J. Spss survival manual: A step by step guide to data analysis using spss for windows. Version 10 ed. 2001, St Leonards, N.S.W: Allen & Unwin.

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