

**IMPACT OF LAND FRAGMENTATION ON AGRICULTURAL PRODUCTIVITY IN
BHUTAN**

Dissertation Submitted to



The IIHMR University, Jaipur

For the partial fulfillment for the award of the degree of Master of Business Administration
(MBA)

In Rural Management by

Deki Yangzom

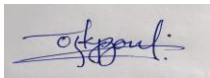
Under the Supervision and Guidance of

Professor Dr. Sazzad Parwez

2021

Declaration by Student

I hereby declare that this dissertation titled Impact of Land Fragmentation on Agricultural Productivity in Bhutan is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of other has been duly acknowledged in the text



Deki Yangzom

01/07/2021

CERTIFICATE

This is to certify that dissertation titled Impact Of Land Fragmentation on Agricultural Productivity in Bhutan is a record of the research work undertaken by Deki Yangzom in partial fulfillment of the requirements for the award of the degree of MBA Rural Management from the IIHMR University, Jaipur under my guidance and supervision and her approach to the research study has been sincere, scientific, and analytical.

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Abstract

This paper critically analyses and illustrates the impact of land fragmentation on agricultural productivity in Bhutan. Land fragmentation is a major concern to be addressed as it has huge impact on agricultural productivity at the larger scale as well as at household level. The country has an absolute topographical zone of 38,394 square Kilometers with a populace of 745,600 individuals. It has just 2.93% of developed territory, roughly 80% of the numbers of habitants in Bhutan are associated with agriculture and Economy of the Bhutan is fully dominated by the agriculture. Thus if the nation continuously allows the practice of land fragmentation within the household, there may be huge impact in securing food security in the country. Both primary and secondary methods are involved. In the primary, Focused Group Discussion is used to collect information from the households; Key Informants in gathering information/data from district officials and online goggle survey questionnaires is also conducted. Secondary data were mostly collected through the land records from National Land Commission Secretariat (NLCS), Ministry of Agriculture and Forestry (MoAF). Maps and related figures helped in analyzing the level of cause and effect of Land fragmentation on agricultural productivity. Moreover information from authentic pages, book, report and most importantly government legislation were implied. The study depicts and indicates the situation of land fragmentation on agricultural production in Bhutan. This will help the policy makers and those in charge of making laws and strategies in the cause and effects of land in Bhutan. Minimizing land fragmentation is very important as most of the Bhutanese population depend on agriculture for their livelihood.

Keywords: Land Fragmentation, Agricultural Productivity, Economy, Bhutan

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ABBREVIATIONS

DoA	Department of Agriculture
FGD	Focused Group Discussion
GNH	Gross National Happiness
MoAF	Ministry of Agriculture and Forest
NEC	National Environment Commission
NLCs	National Land Commission Secretariat
NLP	National Land Policy
NLUZ	National Land Use Zoning
NSB	National Statistical Bureau
PHCB	Population and Housing Census of Bhutan
PSL	Priority Sector Lending
SLM	Sustainable Land Management

CHAPTER ONE: INTRODUCTION/ BACKGROUND

BACKGROUND INFORMATION

Land fragmentation also can be called as pulverization, Clout (1) parcellization or scattering, is the sort of land proprietorship design were “ a single farm consist of numerous discrete parcels, often scattered over wide area” Binns (2). Land fragmentation inside a farm might be brought about by a few factors that can be delegated follows; socio-cultural variables, affordable elements, topographical factor and operational components, King and Burton (3). Social cycles have a significant impact promoting land fragmentation. Most significant are the laws in regards to legacies that favor an equivalent division of a land property among the beneficiaries. When the cycle of land fragmentation has begun it proceeds with geometrical progression at each succeeding age. The prudent cycles are significant when affordable or mechanical changes happen inside a homestead. At times a farmer, in the purpose of extending his homestead, will purchase land that doesn’t have spatial contiguity in this way expanding the level of the land fragment. The geophysical variables like climatic conditions can influence the contiguity of a farmland. A significant component in land fragmentation is transhumance that prompts a practical reasonable land fragmentation, by the occasional cycle of relocation from the mountains to the fields region.

Many studies has proven that land fragmentation has both positive impact as well as negative impact but predominantly there are more negative side effects, Chisholm(4). The negative impacts of land fragmentation alludes chiefly to the “time squander” which means the additional movement time that should be dispensed to arriving at each plot, just as the energy extra squandered for developing the corners or along the lines of each plot where the machines work with high trouble. The subsequent downsides impediment of fracture in the troublesome position it’s anything but a farmer who wish to modernize his homestead, by presenting new yields, apparatus, water system frameworks, seepage and spreading out works, bother control. Land fragmentation makes practically outlandish the protection and improvement of the soil quality, the land efficiency decreases radically and their cultivating can get unfruitful. Another

quality of land fragmentation is more worried about the social and regulatory parts of the country life. Fragmentation builds the quantity of individuals associated with carrying out measure in a space consequently the agreement turns out to be more uncertain and collaboration more troublesome, Busch et al., (5). While most specialists depicted the adverse consequences of horticultural land discontinuity, there are some that examined its constructive outcomes. Land fragmentation permits farmers with dissipated plots on an enormous region to rehearse a danger the executives through the presence of various geophysical conditions and harvests planning. A farmer which has a few plots developed with a similar harvest however in various areas attempts the danger of having various creations relying upon neighborhood conditions, yet his yearly production will continue as before. The profit can be kept at an undeniable level by rehearsing various yields on each plot. This is why land fragmentation is practiced in some parts of the region mainly to lessen the danger of the farm bankrupt. Yields planning happen when the plots are situated at various altitudes, and their tearing happens at various occasions. By spreading out the agricultural works like weeding, planting and harvest to several weeks it is possible to avoid bottlenecks. By planning crops the farmers can be auto-effective as far as work by disseminating the labor force as per each harvest requirement.

LAND FRAGMENTATION IN BHUTAN

Bhutan is situated in the southern inclines of Eastern Himalayas. The country has an absolute topographical zone of 38,394 square Kilometers with a populace of 745,600 individuals. It has just 2.93% of developed territory, roughly 80% of the numbers of habitants in Bhutan are associated with agriculture and Economy of the Bhutan is fully dominated by the agriculture. Majority of Bhutanese farmers are little holder with a normal homestead size of 3 sections of land and practice a self-supporting means coordinated cultivating frameworks. Notwithstanding its little size, the agro nature is different because of the enormous variety in height. In agriculture practice, there are three key particular cultivating practices which are the rice, maize and potato based framework. According to National Land Use Zoning (NLUZ) guideline National Land Commission Secretariat (NLCS) from 38,394 square Kilometers, the arable land represents just 7% of the absolute region. Roughly 62% of the Bhutanese public depends on agriculture for their vocation with most subsistence farming. The increment in populace and increase in land fragmentation compromises the little farmers and the agriculture sectors in delivering sufficient food, particularly when the land accessible for development is negligible. The normal homestead size in Bhutan is 0.87 hectares which is a restricting variable in huge scope production.

A sum of 306.55 hectares of chhuzhing¹ was lost to metropolitan turn of events and extra framework improvement from 1998 to 2015. Further, the transformation of chhuzhing to private land in rural regions hugely supports land fragmentation in Bhutan. Regularly, every age of kids in rural Bhutan builds their own houses ashore acquired from their folks as they get married and move out. A landowner can change over the acquired chhuzhing to residential land for a situation that is the lone Chhuzhing land he/she has. The land in Bhutan is allowed to sale and purchase up to 0.04 hectares by the land act of Bhutan, 2007. The persistent division of a land bundle of this size can bring about landholding fragmentation. Particularly when Chhuzing is shared during legacy, it makes the land divides little for significant momentary misuse. LF, including both legacy and deal cases, has expanded from 349 from 2014 to 3102 of every 2018 just in the

¹ Wetland cultivation

country regions. One of the outcomes of the outrageous land fragmentation is that the proprietors of such little packages may sell it and relocate to urban regions for better livelihood and ends up being landless. Thus, small landholders can be defenseless against the danger of being landless if proceeds with land fragmentation are capable. Landlessness is considered as a critical circumstances and logical results of neediness in provincial regions in Bhutan. In certain pieces of the country, the poor are more helpless to neediness as they rely upon deficient land.

CHAPTER TWO: LITERATURE REVIEW

DEFINING LAND FRAGMENTATION

FAO (6) states land is considered as a fundamental common asset, both for the endurance and flourishing of humanity and for the upkeep of every single worldwide biological system moreover land is significant resources for food and shelter. Dhakal and Khanal (7) states the practice of distributing different land areas in parcels for agricultural purposes is known as land fragmentation. Bentley (8) contended land fragmentation as a few non-contiguous land plots every now and again disseminated over a wide territory. Wu et al., (9) adds stating land fragmentation as a phenomenon which exist when a family works various possessed or leased noncontiguous plots at the same time. Land discontinuity includes the decrease in the extents of the individual bundles and normal size of landholding and expanding the dispersing of the parcels, Agarwal (10).

Whereas Dovring & Dovring (11) states land fragmentation as the greater number of distinct plots divided from the particular land. Minimize in the area size of the individual plots and size of the farm holding with the increase in scattering of land holding (12). Van et al., (11) adds land fragmentation, where a solitary ranch has various share of land, is a typical element of framing in numerous nations, particularly in agricultural nations. Land discontinuity is viewed as a hindrance to efficient crop creation and numerous nations have carried out approaches empowering land union. Del et al (13) discontinuity causes an in-wrinkle to move between fields, which further leads to either lower work profitability or higher vehicle costs for data sources and yield also (9) supplements sating practice diminishes the proficiency of machines according to that possible within enormous quadrilateral fields. (10) The impact of land discontinuity on farming has stressed policymakers for quite a while in light of the fact that it is required to be an adverse consequence.

TYPES OF LAND FRAGMENTATION

Van (14) explains four sorts of land fragmentation: a) proprietorship discontinuity that alludes via the quantity of land proprietor who utilize a particular real estate parcel, b) land client's discontinuity that alludes toward quantity about clients so that additionally inhabitants of the land, c) inner discontinuity (internal fragmentation) that alludes to the quality of parcels exploitation before every clients and contemplate bundles dimensions, form and interspace even as the initial issues, furthermore d) division of proprietorship also, use that includes each circumstance like an error within proprietorship and utilize.

Niroula & Thapa (15) defines the whole presence of divided dry land property is viewed as significant element of less created rural frameworks. The primary elements setting off land fragmentation are legacy, populace development, land markets and verifiable or social foundation. King & Burton (16) believes land fragmentation is utilized in two very unmistakable senses. First and foremost, it is regularly taken to suggest the development of farm property into modest units which are excessively little for reasonable exploitation. The subsequent angle is the circumstance whereby an individual holding is parted into numerous non adjoining bundles. A few authors attempt to recognize the two structures by making their own phrasings.

Farmer (17) for instance alludes to the main first structure as subdivision and the second as dissipating. Sanderatne (18) sees the term of land fragmentation as the interaction of division of existing property while parcellization is the spatial isolation of plots which are in fact and financially part of one agricultural endeavor. The issue is additionally muddled by the way that the two sorts of fracture often times exist together, and by the way that solidification is the term applied to the spatial scattering of a farmer's plots over a wide region, intermixed with packages worked by different farmers i.e. for example the subsequent definition given previously. (15) Concludes land fragmentation in the principal sense small homesteads is an issue of more extensive ramifications, connected to issues of overpopulation and captivated land proprietorship and to cycles of land rearrangement as in a traditional land change.

A different study has expressed distinctive different perspectives and assessment over the land fragmentation. For instance, Balikie & Sadeque (19) features that in a country like Nepal and

India experiences basic limitation in increasing the productivity. Conversely farmers in the exceptionally land fragmented areas of Philippines and Malaysia don't consider it as an issues paddy cultivating, Hooi et al., (20). (4) Highlights land fragmentation doesn't fundamentally affect productivity, while Wan & Cheng (21) presume that land fragmentation diminishes efficiency. Schutlz (22) also adds stating that land fragmentation as the misallocation of the current supply of farming area, inferring it as a wellspring of shortcoming. (6) Distinguish distance between bundles as the primary wellspring of shortcoming made via land fracture. Wadud & White (23) adds land fragmentation land fracture decreases proficiency in rice creation in Pakistan and Bangladesh individually.

CAUSES OF LAND FRAGMENTATION

Ntihinyurwa (24) the causes and effect of farmland fragmentation in the studies have consistently been dependent upon conflicting and multidisciplinary banter by considering it either valuable (voluntary) to farmers or blemished. Nonetheless, late studies uncovered that its problematical and gainful situations are directed by a mix of neighborhood explicit outside conditions, changing from financial, social-social, political, biological, specialized to ecological ones, which thusly comparably suggests the variety of their management strategies. (7) The causes of land fragmentation has been categorized in demand-side and supply-side causes. Supply-side can be explained due to the chronicled and topographical issues. Land fracture can likewise be clarified by pressing factor of population growth, farmers in locales where the population shoot up and farmers owns limited land agriculture practitioners have less off-farm openings might be more fragmented. Further reason related to land fracture can be legacy, where farmers need to give their youngster place that is known for comparable quality. Additionally land fragmentation can emerge from the disappointment of land markets to work viably because of government guidelines ashore exchanges.

(7) States the demand-side reasons for land fracture emerge when farmers consider that land discontinuity may have a few advantages. For this situation it is conceivable for the private advantages of land discontinuity to surpass its private expenses. By developing plots in various

areas, variety in yield might be less in light of the fact that the risks brought about by dry season, flood and disease are spread. Further explanation agriculturalist wants to keep divided homesteads which they might have the option to utilize their seasonal labor all the more adequately.

The landscape of Bhutan is generally tough and uneven which restricts the land accessible for agribusiness, cultivating and human settlement. Just about 12% of the absolute land is accessible for resources cultivating and human settlement. The expansion in populace with a yearly development pace of 2.5% likewise expands interest for the restricted accessible land asset. A portion of the critical concern viewing land have been perceived as landlessness or restricted size of land possessions, restricted admittance because of the topographical territory of the country, lack of labor in the household and cataclysmic events happening in the country mentioned by Tshering et al.,(25)

Kadigi et al., (26) emphasized on land fragmentation as a source of ineffective agriculture and as a significant danger to effective production due to division of the land. It also hurt profitability in various manners; divided land property can build transportation costs. Fragmented lands property may likewise make challenges develop certain harvest, and keep agriculture practitioners from changing to high benefit crops. Maximum beneficial harvest, as for instance natural Product crops, requires bigger plot territories, so if the farmers just have little and divided plots they might be compelled to develop just less beneficial yields. Furthermore in the event that the plots are situated a long way from one another, there is an exercise in futility for the labors spent on going in the middle of the plots and home, scattered and small results in increase in expenses and requires more land for fencing, line development, and roads. Land fragmentation likewise builds disputes between neighbors.

EFFECTS OF LAND FRAGMENTATION

CONS OF LAND FRAGMENTATION

Demetriou et al., (27) elaborates fragmentation in the land leads to several issues and complications, due to the disparity and irregular shapes it cause difficulty in using modern

machineries and suddenly affect in applying modern agricultural technology. Also other issues like waste of capital, labor, soil, productivity and land conflicts are common. Thus it's complicated to apply modern development strategies in agricultural enterprises. Moreover as the boundaries of the parcels are demarcated by the stone walls, ditches and fencings, it again hinders in the transportation of the modern agriculture equipment.

Niroula & Thapa (28) proves that in south Asia land fragmentation directly caused negative impact to land degradation and which resulted in drop down of the agriculture productivity. (11) Supports stating the trend and culture of dividing the land within family members not only results in decrease in low agriculture productivity but also highlights on rising disputes within the land proprietors and increased social tensions. Deininger et al, (29) states small land holding in country sides can also encourage people to take interest in rural to urban migration due to low productivity due to small land holding and outcomes. Excessive land fracture was a worry for complete loss of land because the land is over utilized that hamper the quality and efficiency. Land fragmentation can also be blamed for the poverty.

PROS OF LAND FRAGMENTATION

The impact of land fragmentation on farming has stressed policymakers for quite a while in light of the fact that it is relied upon to be adverse consequences. While most specialists deprecated the adverse consequences of agricultural land fracture, there are some that examined its constructive outcomes.

An advantage related with land fragmentation is the assortment of soil and developing conditions that diminish the danger of absolute yield failure by giving the farmer an assortment of soil and developing conditions. (13) Various plots permit farmers admittance to place where there is various plots place where there are various characteristics with regards to soil, slope, and microclimatic variations etc. (10) we can't expect same yield from each year, one year can be with better harvest and the following year with much poor harvest, accordingly a few plots of a similar harvest likewise fans out danger. What's more, a holding with a few plots works with crop revolution and the capacity to leave some land. Another advantage of land fragmentation is the utilization of various eco zones. (17) Various plots empower farmers to grow a more

extensive blend of yields. Since crops ready at various occasions when the plots are in various elevations, fanning out the horticulture work like collect and sawing during a more extended timeframe assist farmers with keeping away from family work bottlenecks. This is particularly significant when the developing period of the harvest is short and effectively makes periods of pinnacle work interest. Spatial isolated farmland brings down the danger that the whole yield is influenced by the disaster and pastes in a similar developing season (3). Land fragmentation upgrades the creation hazard by expanding the item variety. In the discontinuity circumstances, the farming item variety might be expanded. Since when families have a few plots which vary in miniature climatic and ecological conditions, there is probability of developing more kind of yields or plants certain.

Moreover, land fragmentation helps in decreasing contentions concerning land proprietorship and use through expanding individual ownership. The discoveries affirm the constructive outcomes on food security at the family level (19). Subsequently, if land residency security is very much ensured, it can build the pay of the farmer, fundamentally when individuals depend on agrarian production for little scopes, the yield of harvest would increment directly. Additionally, (10) proved that more modest parcels created a better yield than the bigger bundle meaning a positive impact

REASONS FOR LAND FRAGMENTATION

(10) States social and cultural have a significant impact promoting land fragmentation. Most significant are the laws in regards to legacies that favor an equivalent division of a land property among the beneficiaries. (20) When the cycle of the land fracture has begun it proceeds with geometrical progression at each succeeding generation. The efficient cycles are significant when conservative or mechanical changes happen inside a farm. Now and then a farmer, in the aim of extending his homestead, will purchase land that doesn't have spatial contiguity hence expanding the level of the land fracture. (8) The geophysical elements like slants, climatic conditions can influence the contiguity of a farmland. A significant component in land discontinuity or fragmentation is transhumance that prompts a prudent reasonable land fracture, by the occasional cycle of relocation from the mountains to the fields region.

Land fragmentation permits farmers with dispersed plots on an enormous region to rehearse a danger the board through the presence of various geophysical conditions and harvests booking. Friedle (30) a farmer which has a few plots developed with a similar yield yet in various areas embraces the danger of having various creations relying upon nearby conditions, however his yearly production will continue as before. The benefit can be kept at a significant level by practicing various harvests on each plot. This is kind to be the principle reason for keeping land fragmentation mostly by having the chance of practicing various yields and diminishing the danger of the farm bankrupt. Forbes (31) yields booking happen when the plots are situated at various altitudes, and their ripping happens at various occasions. By fanning out the farming works (for example cultivating, weeding, and harvest) to half a month it is feasible to keep away from household work bottlenecks. By scheduling crops the farmers can be auto-effective as far as work by appropriating the labor force as per each yield necessities.

CHAPTER THREE: RESEARCH METHODOLOGY

STUDY AREA

Trongsa dzongkhag²(krong-gsar rdzong-khag) is one of the areas of Bhutan. It is the most central region of Bhutan and the geographic focus of Bhutan is situated inside it at Trongsa dzong³. Total areas in Trongsa is 1,807 km square (698 sq mi) with the population of 19,960 according to Population Census 2017 and elevation ranging 800 meters to 4,800 meters above ocean level. Trongsa locale is lined by Wangdue Phodrang⁴ area towards the west and Bumthang region toward the east. Toward the south it borders Tsirang, Sarpang, and Zhemgang areas. The majority of Trongsa areas are environmentally protected. Wangchuk Centennial Park in north and Jigme Singye Wangchuck National Park in central, western, and southern Trongsa are associated by natural passageways, which are all secured spaces of Bhutan.

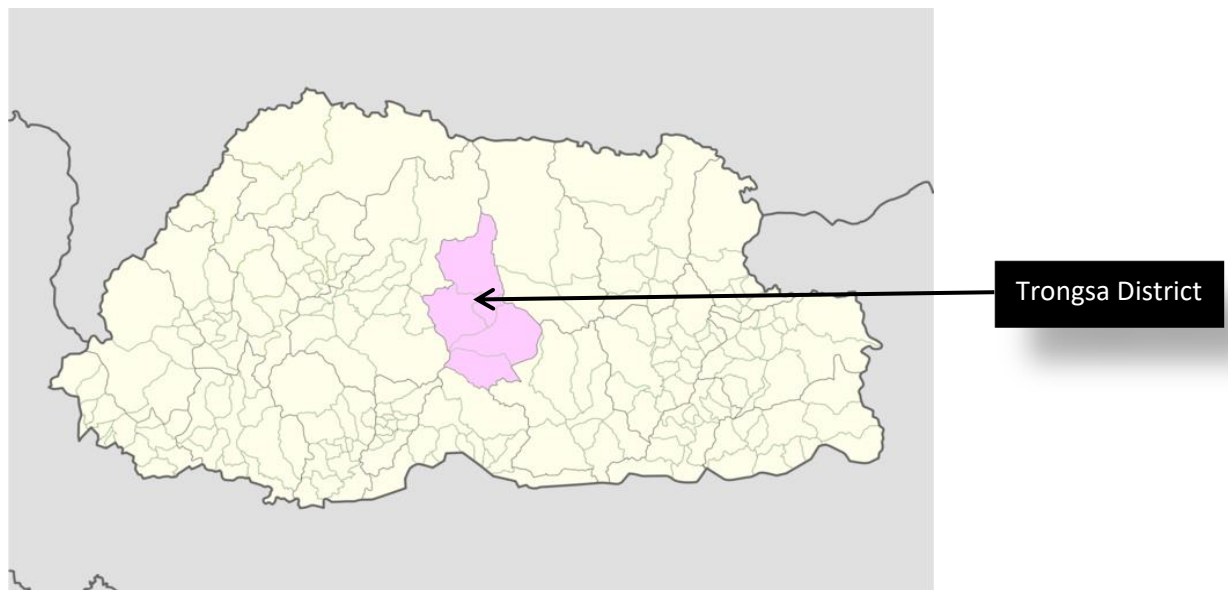


Figure 1.1: Central Bhutan

² district

³ fortress

⁴ Nearest district

There are majorly five gewogs⁵ namely, Drakteng, Korphu, Nubi, Tangsibji and Langthel gewog. Langthel gewog is selected for the study and the reasons for selecting it are as follows;

- Major agriculture practice are done in Langthel compared to other gewogs due to favorable climatic condition
- More number of household and population are counted.

PHCB-2005 stated there are 13 villages, 335 household and 2637 populations in Langthel gewog. The gewog cover to west and north space of 508.4 km square and it imparts limit to Tangsibji and Drakteng Gewog to west and north, Korphu towards the south and Zhemgang dzongkhag towards the east. There are three villages (Jangbi, Womling and Phungzor) where Monpas⁶ lives in the lower part of the gewog who completely accepted to be the primary occupants of the country.

Dangdung Village falls in Langthel gewog under Trongsa dzongkhag. Dangdung villages consist of 50 households and 1050 population. The village has one community hospital, milk processing unit, car wash, lower secondary school, and a temple. The village is perfectly encircled by the agribusiness field and mountains.

The crops grown in that place are maize, paddy, barley, buckwheat, wheat and vegetables. Cash crops grown here are banana, guava and oranges.

⁵ Village blocks

⁶ Tribes

LANGTHIL GEOG OF TRONGSA DZONGKHAG

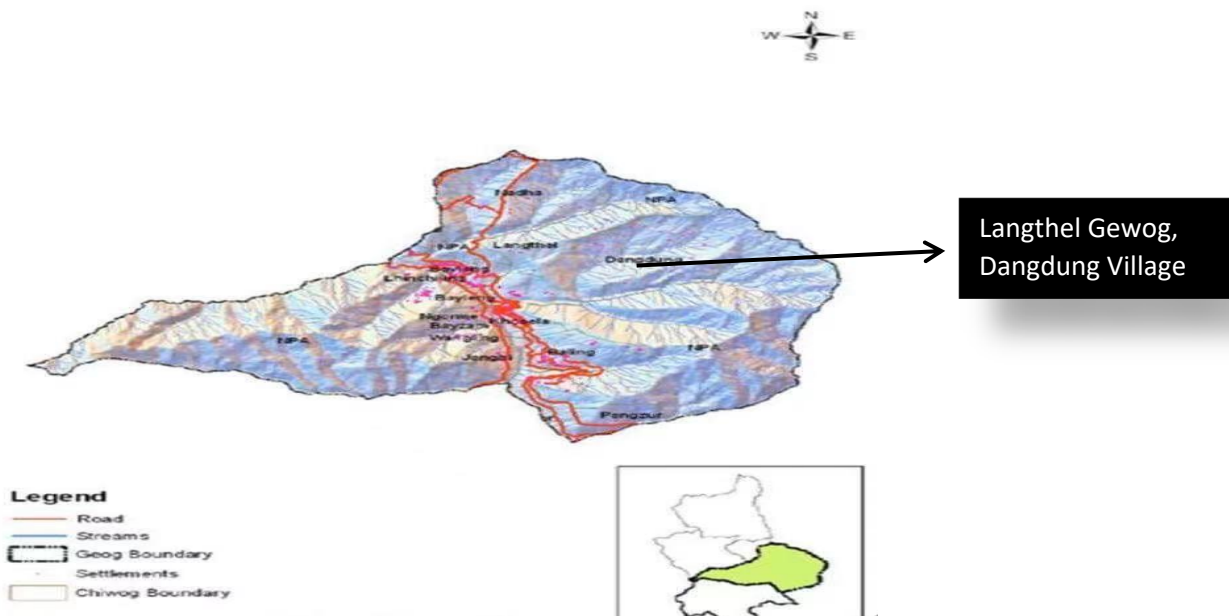


Figure 1.2 Langthel Gewog

DATA COLLECTION METHODS AND MATERIALS

The primary information was gathered through qualitative and quantitative methodology. The quantitative methods helped in gathering the assessments of the household and other participants with organized and structured interviews. Collection of data through semi-structured interviews with focused group discussion (FGD) and Key informants (KI) were done under the qualitative approach. Both qualitative and quantitative approaches helped in well understanding of the research problems. For the focused group discussion and Key informant both MCQ and categorical questions were asked to the participants.

PRIMARY DATA COLLECTION

Focus Group Discussion (FGD)

Focused group discussion was used to engage the local households to meet the objective of the research. FGD helped the participants to discuss and share their opinion freely within

themselves. All the knowledgeable elders and senior citizens participated in the discussion and that helps in tracing the causes, positive and negative impacts and other measures to overcome land fragmentation issues were raised and discussed. Similar type of discussion was used for Key Informants to focus on the study objective.

Key Informant information (KII)

In Key informant, more responsible and authentic person like village head, district head and Agriculture officer were involved. There were mostly asked open ended questions to give them more space to speak and share their opinion with regards to study objective. Furthermore it helped in gaining individual definition, belief and measures proposed by them to increase agriculture productivity in central Bhutan.

Structured question for Youths and in-service people

For the youths and other in-service people, total 10 structured online questions which included multiple choices and open ended were framed to gain their opinion and concern as they being future generation of the nation.

SECONDARY DATA COLLECTION

Secondary data were mostly collected through the land records from National Land Commission Secretariat (NLCS), Ministry of Agriculture and Forestry (MoAF). Maps and related figures helped in analyzing the level of cause and effect of Land fragmentation on agricultural productivity. Moreover information from authentic pages, book, report and most importantly government legislation were implied.

SAMPLING

For Key informants, purposive sampling was used to select the informants, just to meet the answers to research objectives regarding their experiences and knowledge to elaborate the concept and issues. In total 5 participants for Key Informants were selected mainly with the help of village head and family. For Focused Group Discussion, 10 members including from the

gewog office and household members were selected. For the structured survey, 27 random respondents of youths and in-service were taken into account.

DATA ANALYSIS

Thematic analysis was used for the analysis of information collected from Key Informants, FGD and for the open ended questions conducted online. For the close ended conducted for online survey to the young generation, FGD, KII, it was analyzed through SPSS Software, Microsoft Excel, descriptive statistics and Google quiz. For the further interpretation of the data, graphs, pie charts and were used. Other land information was generated from land records through using citizenship and household numbers.

ETHICAL CONSIDERATIONS

In any kind of research confidentiality and consents is very important to consider. During the data collection of the study, confidentiality of the responses provided by the responders for the open ended responses were highly considered and for the multiple choices questions respondents were properly briefed on the topic. For the record of the verbal discussion, consents from the respondents were asked. Online survey was also completely optional, respondents have full rights to skip the questions as well as deny it completely if it's anyhow hurts their sentiments.

RESEARCH DESIGN

Data collection methods, research objectives and questions, the source of information and respondents were clearly mentioned in Appendix 1

CHAPTER FOUR: RESULTS AND DISCUSSIONS

Apart from Land Act in Bhutan 2007 and Land Rules and Regulation 2009 in Bhutan there is not proper definition over land fragmentation in Bhutan so far. In aforementioned context it states “*the minimum parcel of land that shall be registered in a Thram⁷ is 0/10 acres.*” In Land Act of Bhutan 2007 and “*in the event, the proposed transaction shall result in sub-division of land less than 0.10 acres for rural and 0.13 acres for Throm⁸, such a transaction shall not be entertained.*” in Land Rules and Regulation 2009. However Local Area Plans (LAPs) states there are fewer limits for the sub-division in the Throm. Also family members enjoys equal amount of land division in Bhutan through the Inheritance Act.

Key informants and Focused Group Discussion respondents define land fragmentation as division of the land over time and it happens mostly due to legacies. Respondents from the online survey states it is a division of the land for various cropping and to safe the crops from natural calamities and crop diseases.

LAND USAGE

From the data collected, lands in Bhutan are mostly divided into two which is for residential purpose and mostly agriculture purpose. Chuzhing covers approximately 62% only for paddy cultivation, 8% residential and 54% under residential areas. Solely maximum percentage shown for the paddy cultivation is much more than any other, thus the area has low commercial values.

⁷⁷ Household land record

⁸ Urban

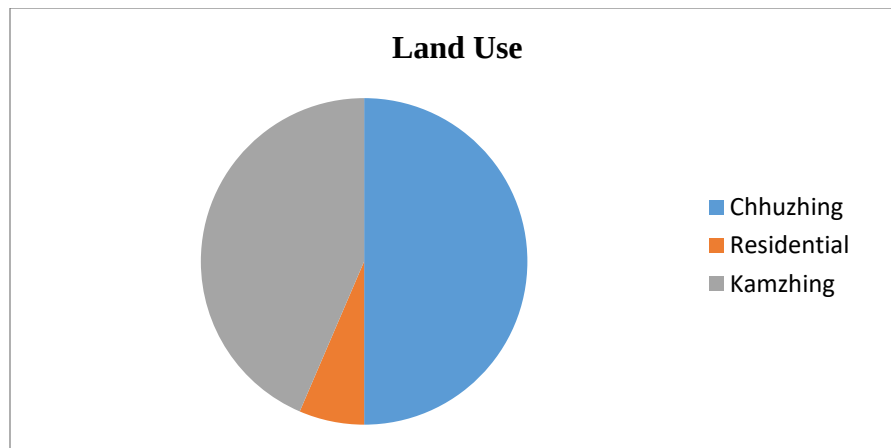


Figure 1.3 Land use Pie chart

CAUSES OF LAND FRAGMENTATION IN BHUTAN

The factors mentioned below are the causes of land fragmentation in central Bhutan.

1. Land Act, 2007

Somehow Land Act, 2007 encouraged land fragmentation in Bhutan, though the Land Act of 1979 totally discouraged fragmentation or transaction if the household has land less than 5 acres. As the new law implemented such laws aren't applicable. However in revised land Act the provision doesn't exist. Moreover there isn't any strict law that to prevent land fragmentation.

2. Change of Chhuzhing to other

The conversion of the cultivating land to other land use isn't prohibited instead it is allowed according to the Land Act 2007. Chhuzhing is the only land in Bhutan where farmers cultivate paddy in larger scale. The study shows in the recent times Chhuzhing conversion is seen and recorded in massive way in Bhutan. It is one of the major concerns which can make huge impact on agricultural productivity in Bhutan.

3. Inheritance

Through the discussion and research, inheritance or legacies leads to land fragmentation in Bhutan. Division of the family land equally among the family members has become trend from ancient period of time and it is mainly carried out to prevent any family disputes within the family. Almost 92.6% believed that inheritance system heavily impacted on land fragmentation.

While dividing if he/she gets single Chhuzhing, then the conversion of the particular chhuzhing to other land purpose is very easy. Thus it hampers in agricultural productivity.

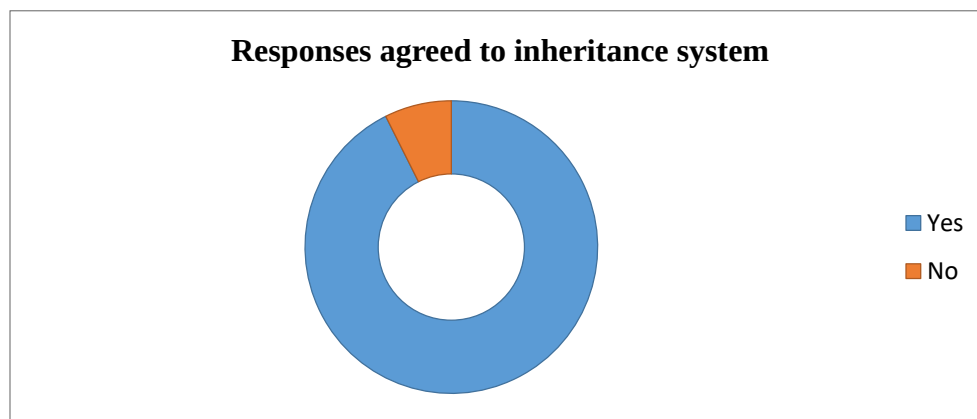


Figure 1.4 responses chart

MEASURES TO PREVENT LAND FRAGMENTATION

1. Sustainable Land Management (SLM)

SLM was established in 2006 by the NSSC with the help of various global donors like UNDP, World Bank and Global Environment Facility (GEF). Land fragmentation is sometimes caused due to the natural calamities and other agriculture constraints such as lack of irrigation facilities, poor farming etc., thus to prevent such causalities SLM helps in protection of water source, maintenances of the irrigation channels, development of the dams etc.,

2. Prohibition of the sale of Kidu⁹ land

Through Druk Gyalpo's kidu, land were granted for the landless citizens, thus to preserve the Land Act 2007 prohibited sale of the kidu land within ten years. Some of the recipients in the FGD mentioned the reason behind it is to prevent the land from fragmentation and to emphasize on agriculture production and sustainability.

3. Reconstruction of irrigation system

Mostly the lands were kept fallow due to insufficient of cultivation water and improper water sources. The royal government of Bhutan takes ever measures to mitigate such issues by

⁹ King's relief support

continuing maintenance of the irrigation dams, providing water pumps for the lands near water sources or river. Moreover maintenance of the irrigation system is prioritized by the government to stop land fragmentation as well as to increase agriculture productivity.

4. Low interest credit

Credit relation to agriculture is accessible without any collateral and guarantor. Priority Sector Lending (PSL) was established in 2018 in favor of rural vulnerable farmers to help in progressing agriculture production and to limit land sale due to the frustration of insufficient agriculture equipment or services.

5. Some of the respondents suggested stopping the land fragmentation trend within the family by imposing strict rules and regulations. Otherwise it would be a major threats in future on agriculture production.

DISADVANTAGES

Various disadvantages of the land fragmentation were discussed. Land being fragmented results in more transportation costs. The distance created within the farm land and the distance between homes to land required more time travelling in between. Proper management can be more expensive and more time consuming at the same time. Small and dissipated plots squander land fencing, line developments and ways and roads. Land fragmentation may likewise expand the danger of questions between neighbors.

Small fragmented land property may likewise make troubles develop certain yields, and keep farmers from changing to high benefit crops. More beneficial yields, as for instance natural product crops, require bigger plot regions, so if the farmers just possess little and divided plots they might be compelled to become just less productive crops. Different expenses related with land fragmentation incorporate the preventing of economies of scale and homestead motorization. Little and dissipated plots hamper the utilization of hardware and other enormous scope farming practices. In little fields working machines and moving them starting with one field then onto the next can cause issues. Little land property may likewise debilitate the improvement of foundation of foundation like transportation, correspondence, water system, and

drainage. At last it is seen that banks are now and again reluctant to take little, dissipated land possessions as insurance, which keeps farmers from getting credit to make ventures.

ADVANTAGES

Besides having numerous drawbacks of the land fragmentation, some positive impacts were also discussed on the topic. An advantage related with land fragmentation is the assortment of soil and developing conditions that decrease the danger of all out crop disappointment by giving the rancher as assortment of soil and developing conditions. A wide range of plots permit farmers admittance to place where there is various characteristics with regards to soil, incline, and miniature climatic varieties and so on. Field with significant harvest one year may the next year create a lot of lower yields, in this manner a few plots of a similar harvest additionally fans out the danger. Furthermore, a holding with a few plots works with crop revolution and the capacity to leave some land neglected.

Another advantage of the land fragmentation is the utilization of various eco zones. Various plots empower ranchers to grow a more extensive blend of harvests. Since ripping of crops varies from various altitudes, it helps farmers when spreading out the crops pattern and places. Land fragmentation also helps to overcome labor demand as the cultivable lands become small there is no need of vast labor force. Most importantly land fragmentation is practiced to create harmony and tranquil within the family or to stop any further disputes due to property. Majority of the respondents agreed to the point that division of the family land within the family members creates harmony.

CHAPTER 5: CONCLUSION AND RECOMMENDATION

The study depicts and indicates the situation of land fragmentation on agricultural production in Bhutan. This will help the policy makers and those in charge of making laws and strategies in the cause and effects of land in Bhutan. Minimizing land fragmentation is very important as most of the Bhutanese population depend on agriculture for their livelihood. Following are the recommendations:

- I. Prevention of any further land fragmentation of agricultural land to prevent the farm lands from becoming smaller and non-viable to enhance agricultural productivity
- II. As most of the lands are fragmented, there is lesser ways to increase agriculture productivity. Thus encouraging group farming in larger extend would survive agriculture productive to keep sustainable food security
- III. Breakage of lands into different parcels and owned by various owners can lead to major disaster on food security, strong rule and regulation should be regulated by Land Act.
- IV. Further encouraging such research to emphasis on the impact of land fragmentation will create awareness within the community and may create some changes to stop this disaster (land fragmentation).

The study emphasis only on central Bhutan, future research can be carried out in different study area can help in sustaining agriculture productivity.

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