

Impact of Land Fragmentation on Agricultural Productivity in Bhutan

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Research Problem

- Bhutan's Rugged terrain with limited arable land for only 7% of the total land.
- 60% forest coverage according to the Gross National Happiness (developmental philosophy)
- 75.3% of the arable land available has been registered on freehold ownership
- Increasing Pressure on limited land
- Division of Chhuzhing (wetland cultivation) during inheritance
- The ongoing land fragmentation might have implications for food security in the near future

Research Objective

- To find the impact caused by the land fragmentation on agricultural productivity
- To figure out the government policies and actions to prevent land fragmentation
- To understand land fragmentation and its effects

Chapter one: Background

- Land is a basic resource for agricultural production.
- Land fragmentation (LF), in which a single farm uses several parcels of land, is a common feature in many countries.
- Land fragmentation, also known as pulverization parcellization or scattering, is the type of land ownership pattern where a single farm consists of numerous discrete parcels, often scattered over a wide area

four types of land fragmentation are commonly reported:

- i) ownership fragmentation which refers to the number of landowners who use a given piece of land,
- ii) land user's fragmentation which refers to the number of users that are also tenants of the land,
- iii) internal fragmentation (within a farm) which refers to the number of parcels exploited by each user and considers parcel size, shape and distance as the main issues, and
- iv) separation of ownership and use; which involves the situation where there is a discrepancy between ownership and use

- Land Fragmentation is a universal concern, although it is believed most closely associated with Europe.
- Various studies documented on LF in different countries
- South Asia (Niroula & Thapa), China(Tan,2006), Vietnam (Sundqvist & Andersson,2006), Bangladesh (Rahman & Rahman 2009), Ethiopia , Kenya & Uganda (Flintan,2011), India (Manjunatha 2013), and Nepal (Dhakal & Khanal,2018)

Land Fragmentation in the context of Bhutan

- Geographical Area- 38,394sq.km
- Population- 735,553 (National Statistics Bureau, 2018)
- Arable land- 7% of total area
- 62% of population rely on agriculture
- Increase in Population and continuous land fragmentation threatens the small farmers and the agriculture sectors in producing enough food.
- Chhuzhing(Wetland cultivation)- 306.55 hectares
- Division of Chhuzhing during inheritance impact on agricultural productivity
- The land Act of Bhutan, 2007, permits the sale and purchase of private registered land.

Chapter Two: Literature Review

- Balikie & Sadeque 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. Highlights land fragmentation doesn't fundamentally affect productivity, while Wan & Cheng presume that land fragmentation diminishes efficiency. Schutlz also adds stating that land fragmentation as the misallocation of the current supply of farming area, inferring it as a wellspring of shortcoming

Advantages of Land Fragmentation

- Land fragmentation allows farmers with scattered plots on a large area to practice a risk management through the presence of different geophysical conditions and crops scheduling.
- Risk management through the presence of different environmental conditions. A farmer which has several plots cultivated with the same crop but in different locations undertakes the risk of having different productions depending on local conditions, but his annual productions will remain the same
- The profit can be kept at a high level by practicing different crops on each plot. This is considered to be the main reason for keeping land fragmentation mainly by having the possibility of practicing different crops and reducing the risk of the farm bankrupt.

Shortcomings of Land Fragmentation

- 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.

Chapter Three: Research Methodology

Study area

- Trongsa Dzongkhag (Central Bhutan) majorly have five gewogs (village blocks) 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.**
- 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

Data Collection Methods

- 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.

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, 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.

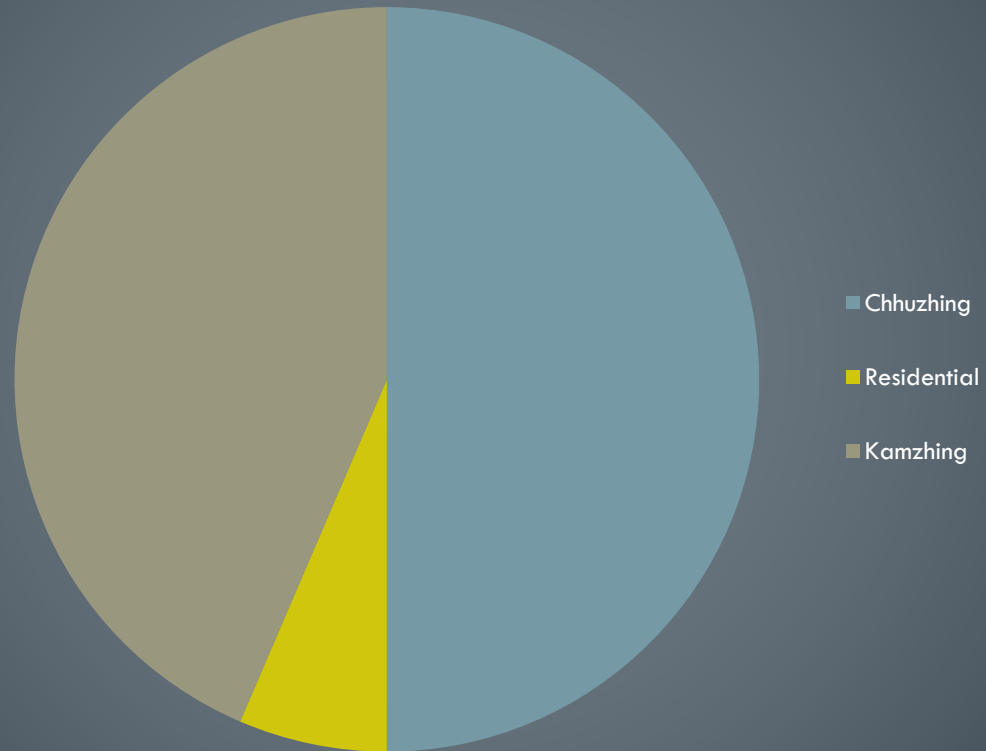
Ethical Consideration

- 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.

Chapter Four: results and Discussion

- 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 Thram 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 Throm, 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.

Land Use



Cause of Land Fragmentation in Bhutan

- **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.
- **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.
- **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.

Measures to Prevent Land Fragmentation

- Sustainable Land Management (SLM)
- Prohibition of the sale of Kidu (King's relief support) land
- Reconstruction of irrigation system
- Low interest credit

Chapter Five: Conclusion and Recommendation

- 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:
- Prevention of any further land fragmentation of agricultural land to prevent the farm lands from becoming smaller and non-viable to enhance agricultural productivity
- 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
- 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.
- 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.

THANK YOU

Stay safe ☺