Out-migration and its consequences in the Mountains of Nepal: An example of southern Sankhuwasabha, Nepal

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Abstract

This paper attempts to examine the consequences of depopulation especially in the Mountains of Nepal. Moreover, it also aims to find out the trends and causes of depopulation. This paper is prepared by both primary and secondary data. The primary data is collected through an online questionnaire to migrants' workers from the study area. The records of in-migration and out migration is collected from the website of Department of National ID and Civil Registration, Nepal as secondary source. Similarly, the other required population data is acquired from the National Statistics Office (NSO) to prepare this paper. The study reveals that there is a higher tendency of out-migration than in-migration which may cause depopulation. Lack of employment opportunities, educational and health facilities are the main causes of higher out-migration in the study area. This study also found that the impacts of outmigration on the origin communities such as changes in land use and land cover, lack of productivity, loss of rural production, increases the coverage of forest/vegetation area, increasing the activities of wild animals. This study may contribute to build a deeper understanding of migration dynamics in rural Nepal, shedding light on the multifaceted implications for both migrant individuals and their communities of origin. The results of this study will be highly beneficial to the policy makers and planners to address the widespread challenges due the depopulation in Nepal.

> *Keywords: Depopulation, out-migration, in-migration, absentees, fallow land, land use and land cover changes.*

1. Introduction

Outmigration from the traditional land has become a key livelihood strategy for an increasing number of rural households in Nepal (KC & Race, 2020). According to the recent national population census in 2021, nearly, one in every four households (23.4% of 1.56 million households) has at least one member absent or living outside of Nepal (National Statistics Office [NSO], 2023). It leads to increased depopulation in Nepal especially in the Hills and Mountains in Nepal. Depopulation in the Koshi Hills and Sankhuwasabha district is no exception due to outmigration. Young people continually leave rural areas to seek new

opportunities outside of Nepal and inside Nepal. It changes the local patterns of land use and mobilization of local resources due to agriculture contraction and an increase in fallow lands and wild vegetation which caused the deficiencies of local production. Both natural and human factors frequently cause changes in land use. Any area's current land use patterns are a product of human activity over time, but they are also profoundly influenced by the environment (Pradhan & Sharma, 2017). Moreover, Chidi et al. (2019) claimed an inherent relationship exists between human actions and their environment. Thus, the local land use patterns and local resources can be governed by the activities of the inhabitants of the people. Moreover, they argue that substantial outmigration of the population leads to land conversion and abandonment in Nepal's rural hill and mountain areas. Similarly, Jaquet et al. (2015) argue that the changing pattern of demography leads to land use changes. In addition, another study carried out by Jaquet et al. (2019) highlighted the significant effects on land management caused by outmigration. Labor shortages caused the land to be abandoned, leading not only to degradation and erosion but also to an increase in vegetation cover. Adhikari and Hobley (2011) highlighted that the cropping intensity has decreased, fallow land has grown particularly in remote and marginal areas and the amount of forest cover on both public and private properties has increased due to outmigration. NSO (2023) reported that the trend of rural-to-urban migration is increasing every day and it has been creating various serious problems in natural resource mobilization, utilization, development of rural areas and many similar problems in the Hills and Mountains in Nepal. Population growth of Nepal has been 0.92% per year however, there is a negative population growth rate in various 34 districts in Nepal (NSO, 2023). These districts mostly comprise of the Hilly and Mountainous regions of Nepal.

The migration trends from ecological areas have been practiced since traditional phenomena, especially after the eradication of Malaria, the government of Nepal initiated the resettlement program which encourages migration to Terai from Hills/Mountains (Kansakar, 2006). There are myriad studies conducted on the issue of migration that explored numerous facts in Nepal though, most of these researches are concentrated on finding out the determinants/causes of migration and push and pull factors of migration such as Pandey (2008); Thapa (2023); Chapagain (2007); Dangol (2016). However, only limited studies focused on exploring its impacts at the place of origin. But still, internal migration issues have not been adequately recognized in academia. There is still a lack of studies on a micro-level comprehensive analysis of the consequences that emerged at the place of origin is unexplored although this has been important for the research and this paper attempts to explore these facts.

2. Objectives

The main objective of this paper is to explore the consequences of out-migration in southern Sankhuwasabha of Nepal. Moreover, it also describes the trends of out-migration from the study area and portrays the population dynamics in the hilly areas of Nepal.

3. Methods and Materials

Both primary and secondary types of data have been used to prepare this paper. This paper is descriptive, and the primary data were collected from the online survey.

Study area

This study is confined to the southern part of Sankhuwasabha district of Koshi Province. This district is large in terms of its area/geography (3480 km^2) (Pradhank & Sharma, 2017) and the district has two parts such as the northern and southern. The northern part lies in the northern region of this district comprises Khandbari Municipality and Silichong, Makalu, Sabhapokhari, Chichila and Bhotkhola Rural Municipalities. On the contrary, Panchkhapan, Chainpur, Madi and Dharmadevi Municipalities are in the southern part of Sankhuwasabha. The southern part of the Sankhuwasabh district is the study area of this study and it was purposefully selected. The respondents were out of countries for foreign employment at present and the data was collected through structured questionnaires. The absentees filled out the questionnaires online.

The total population of this district is 158041 and the total households are 39173 (NSO, 2023). Moreover, the NSO (2024) reported that 7904 are absentees from 6369 households in this district. The total population of this study area is 72473 and the area is 612.65 sq. km. The figure of the study area is as follows.

Figure 1: The map of the study area   **Tools used**
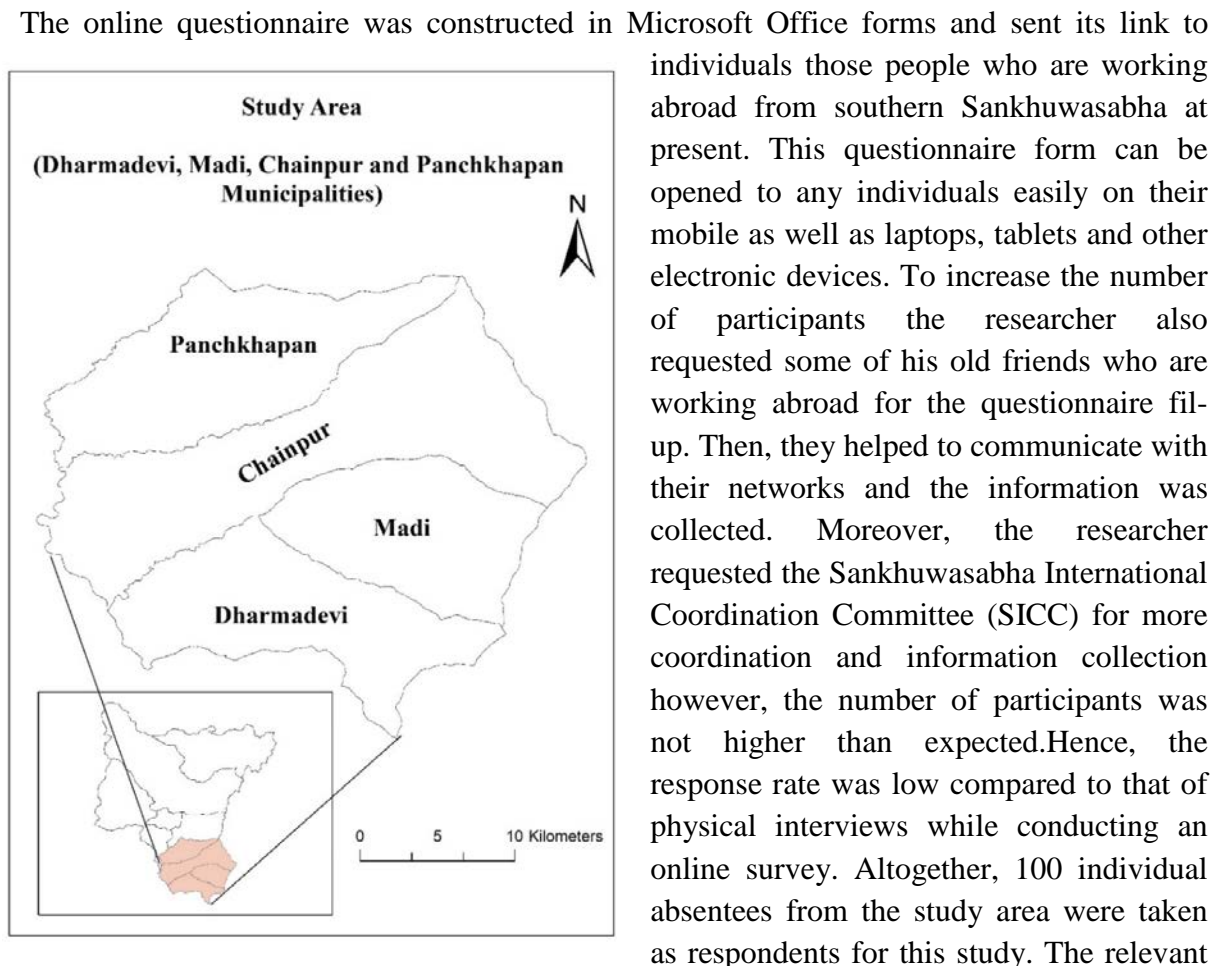
The online questionnaire was constructed in Microsoft Office forms and sent its link to

individuals those people who are working abroad from southern Sankhuwasabha at present. This questionnaire form can be opened to any individuals easily on their mobile as well as laptops, tablets and other electronic devices. To increase the number of participants the researcher also requested some of his old friends who are working abroad for the questionnaire fil-up. Then, they helped to communicate with their networks and the information was collected. Moreover, the researcher requested the Sankhuwasabha International Coordination Committee (SICC) for more coordination and information collection however, the number of participants was not higher than expected.Hence, the response rate was low compared to that of physical interviews while conducting an online survey. Altogether, 100 individual absentees from the study area were taken as respondents for this study. The relevant information was collected from 10 September 2024 to 09 October 2024. Moreover, ArcGIS 10.8 is also used to map and detect land use and land cover changes in the study area.

Secondary Data

To fulfill the objectives of this study, necessary data were collected from various sources such as the National Statistics Office (NSO), the Department of National ID and Civil Registration, Nepal. Especially, the formal reports of in-migration and out-migration cases of respective local levels are taken. In addition, the researcher also used the land use and land cover maps from the website of the International Centre for Integrated Mountain Development (ICIMOD). This data was created by the Forest Research and Training Centre (FRTC) in Nepal, using images from Landsat. The researcher collected maps for the years 2000 and 2019 from this source.

4. Conceptual framework

The literature review suggests that the drivers of outmigration mainly depend upon economic, social, and environmental factors. Moreover, there are profound impacts on the place of origin in various dimensions. The following framework helps to understand the causes of outmigration that cause depopulation in the place of origin and the impact of outmigration.

Figure 2: *Causes and effects of out-migration*
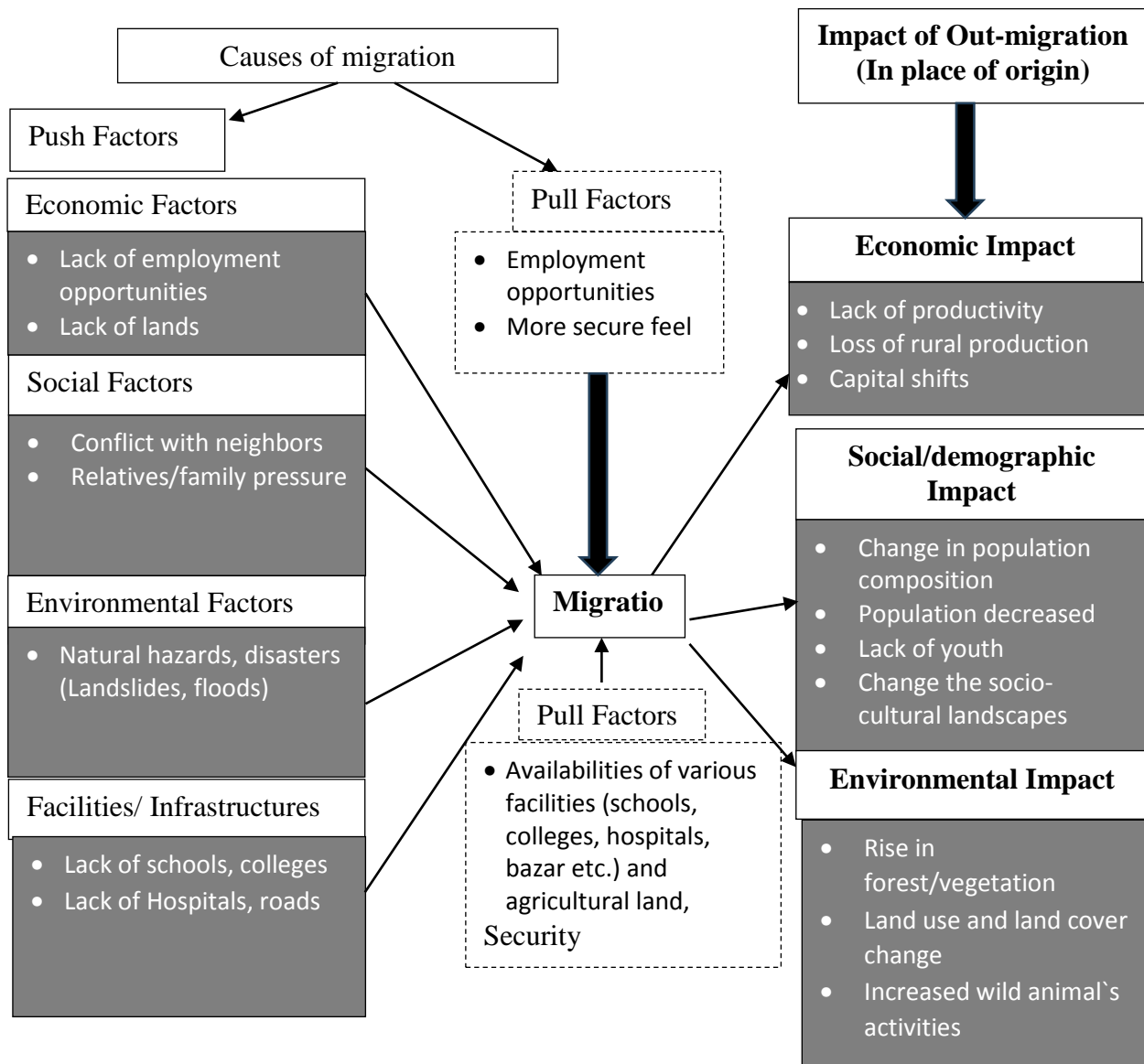
5. Results and Discussions

It deals with the results and discusses the area of outmigration in this paper. What are the causes of out-migration, their destination and their impact on the place of origin due to out-migration are described in this section.

In-migration and out-migration

The Department of National ID and Civil Registration of Nepal provides the information on vital registration such as birth, death, migration, divorce and marriage. Among these, only migration data are analyzed in this paper. Nepal is restructured after the promulgation of the 2015 country`s constitution. Then after Falgun 2073 (B.S.), former Village Development Committees (VDCs) were removed and established at the present local levels such as Rural Municipalities and Municipalities (Linkha, 2018). Hence, the local level data were not available before 2018 (2073 B.S.). After the establishment of new local levels in 2018, due to the lack of a data recording mechanism at every local level, the online data were not recorded initially. The Government's efforts for the systematic recording of vital registration, now the data of the vital registration systems are easily accessible online at the local levels from the Department of National ID and Civil Registration websites. The following data is obtained and presented in-migration and out-migration of the study area in various years.

Table 1: In-migration and Out-migration of the population, 2075-2080 B.S.

Local Levels	Years (B.S.)											
	2075		**2076**		**2077**		**2078**		**2079**		**2080**	
	In	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**	**In**	**Out**
Pancha Khapan	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	15	182	21	131
Chainpur	11	35	23	77	63	129	60	186	71	273	53	165
Madi	7	53	7	47	3	58	19	140	19	173	15	104
Dharmadevi	N/A	N/A	N/A	N/A	7	21	23	121	23	187	21	114
Total	**18**	**88**	**30**	**124**	**73**	**208**	**92**	**447**	**128**	**815**	**110**	**514**

Source: Department of National ID and Civil Registration, 2024

Note: B.S., an acronym of Bikram Sambat, is a Nepali year system which is approximately 57 years forward than A.D. 'In' and 'Out' refer to In-migration and Outmigration respectively and N/A refers to not available (data).

The data provided pertains to the number of people moving in and out of different local levels of study areas such as Pancha Khapan, Chainpur, Madi and Dharmadevi municipalities over six years in the Nepali calendar (2075 to 2080 B.S.). All four local levels consistently show higher out-migration than in-migration across the years. The Year

2079 (2023 A.D) is notable for high out-migration across Pancha Khapan, Chainpur, Madi, and Dharmadevi municipalities. Despite the higher out-migration, there is also the case of in-migration by limited people into the entire local level but it is significantly lower compared to out-migration. This data suggests that these local levels are experiencing significant population declines, which may be due to various factors such as lack of opportunities, economic conditions, or other social factors driving people to migrate elsewhere. Further investigation into the underlying causes of these migration trends would be necessary for a comprehensive understanding. Considering the growth rate of these local levels, all local levels have negative population growth and Dharmadevi Municipality has a higher (-1.22%) than others followed by Madi Municipality (-0.83%) (NSO, 2023).

According to the NSO (2021), Sankhuwasabha district also had a negative population growth rate and reported a -0.04% per year. The neighboring districts around the Sankhuwasabha such as Bhojpur, Dhankuta, Terhathum and Teplejung have the same situation where the population growth rates are -1.39%, -0.78%, -1.3% and -0.53% respectively (NSO, 2023). Likewise, the study area's local levels also have a negative population growth rate. Chidi et al. (2024) highlighted that the districts of the Hill and Mountains regions of Nepal's population growth rate is less than the country`s average from 1991-2021. The population and growth rates of the study area are as follows.

Table 2: Population growth rates of the study area, 2011-2011

Name of local levels	Census 2011		Census 2021		Pop. growth rate (2011-2021)
	Population	**Households**	**Population**	**Households**	
Panchakhapan	17521	3634	16348	4000	-0.67
Chainpur	27308	5938	26799	6648	-0.18
Madi	14470	3216	13273	3281	-0.83
Dharmadevi	18235	3958	16053	4059	-1.22

Source: NSO, 2023

The above data indicates that the population growth rate of whole local levels from 2011 to 2021 has been negative, however, the number of households has increased in 2021 than 2011. This means that the number of household sizes decreased in 2021 compared to 2011. This situation is like the national figure where the average number of family sizes was reduced from 4.88 in 2011 to 4.37 in 2021 respectively (NSO, 2023). Moreover, it also conveys that the population of Nepal from the Mountains and Hills is decreasing due to various causes. This data also highlighted that, according to the recent census data (2021), among the top five lowest-populated municipalities in Nepal, Madi and Dharmadevi ranked third and fifth position and both municipalities comprise this study area.

Table 3: Number of households with at least one absentee and absent population, 2021

Local Levels	Total HHs	HHs with at least one absentee	% of absentee`s HHs out of total HHs	Absent Population		
				Total	Male	Female
Panchkhapan	4000	6121	15.2	740	667	73
Chainpur	6648	1400	21.0	1657	1502	155
Madi	3281	740	22.5	897	824	73
Dharmadevi	4059	887	19.4	897	840	57

Source: NSO, 2023

Table 3 presents the absenteeism at the household and population levels across the selected local levels of the study area. The study highlights the proportion of households with at least one absentee member, the percentage of absentee households, and the gender distribution within the absentee population.

Madi exhibited the highest percentage of absentee households (22.5%), followed closely by Chainpur (21.0%). Panchkhapan had the lowest proportion of absentee households at 15.2% in the 2021 census whereas at the national level, 23.3% had at least one absentee. Comparing the proportions of absent households in the study area to the national level, almost all local levels had lower proportions. Moreover, in Koshi province, the scenario is similar to the national level where 22.7% of households have absentees with at least one member.

In terms of gender perspective, the absentee population is predominantly male, ranging from 89.1% in Panchkhapan to 93.5% in Dharmadevi. Females constitute a smaller portion of the absentee population. At the national level also only 18 % of absentees comprised of females.

Table 4: Absent population abroad by sex and reasons of absentee, 2021

Local Levels	Total absentee	Salary/ wages	Trade/ Business	Study/ Training	Seeking Job	Dependent	Other	Not Stated
Panchkhapan	740 (4.5)	612	5	22	53	44	1	3
Chainpur	1657 (6.2)	1154	3	71	329	81	5	14
Madi	897 (6.8)	747	7	33	50	48	10	2
Dharmadevi	897 (5.6)	741	4	29	63	48	5	7

Source: NSO, 2023

(The number of parentheses refers to the percentages of the absent population out of the total population)

The table provides insights into the absentee population abroad from four local levels (Panchkhapan, Chainpur, Madi and Dharmadevi) in 2021. It illustrates the proportion of absentees relative to the total population and categorizes their reasons for being abroad. The proportion of absentees abroad ranges from 4.5% in Panchkhapan to 6.8% in Madi Municipality.

The reasons for absenteeism highlight labor migration as the primary driver, alongside other socioeconomic factors. The majority of absentees from all regions are abroad for employment at all local levels. The data underscores a migration pattern predominantly driven by employment-related factors (salary/wages and job-seeking), with a smaller proportion abroad for education, dependency, and other reasons. This analysis reveals the economic motivations behind migration and suggests the need for policies addressing local employment opportunities and educational access to reduce dependency on migration.

The age group of absentees

The data reveals that the minimum age of the absent population is 19 years and the maximum age is 57. Similarly, 36 years is a large number that covers nearly 27% of the total absentees. Considering the age group, 35-39 seemed very high followed by the 30-34 age group. The details are demonstrated in the following figure;

Figure 3: Absentees by age group

	15-19	19-20	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59
Numbers	1	3	8	11	19	27	16	11	3	1
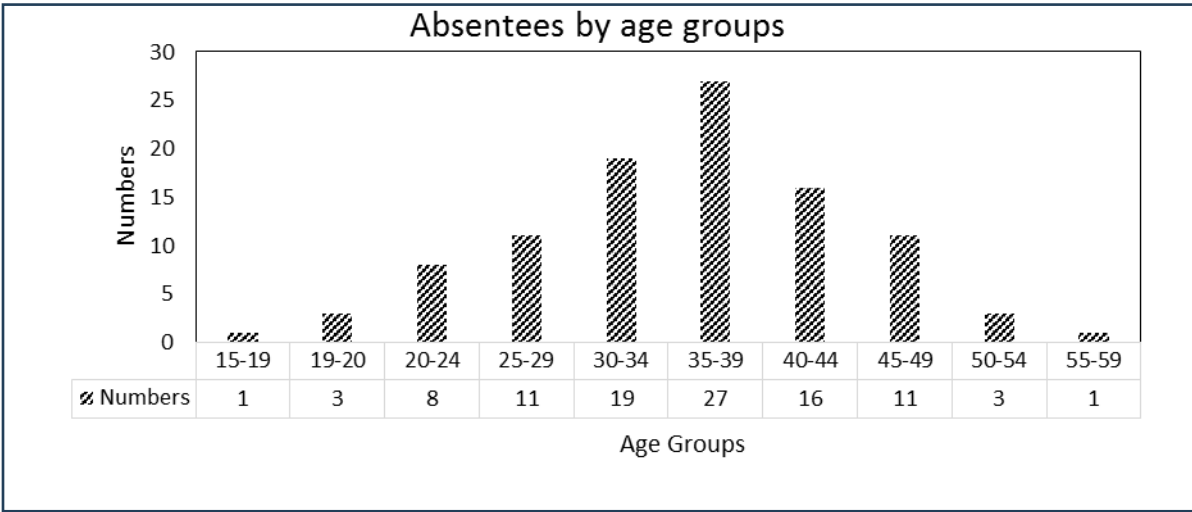
The above data reflects the difference from the national data because around 27% of absentees are in the 35-39 age group followed by the age group 30-34 which accounts for 19%. In this data, 57% of absentees fall under the 25-39 age group. Similarly, there are few numbers of absentees under 24 years and above 45 years old in the study area. The national data reported that a higher proportion of absentees which consists of the 15-39 age group, comprises 86 % out of the total absentees from Nepal. Similarly, the age group between 20-24 years group consists of 29% of the total population at present (NSO, 2024).

Purpose of absentees
The following table presents the purposes of absence, categorized into three groups:

Employment, Dependent, and Others.

Table 5: Purpose of absentees

The purpose of the absentee	Numbers	Percentage
Employment	88	88
Dependent	2	2
Others	10	10
Total	**100**	**100**

Source: Online Survey, 2024

The overwhelming majority of absentees, such as 88% were absent due to employment-related reasons. This indicates that employment is the primary driving force for absenteeism among individuals. Only two individuals, accounting for 2% of the total absentees, are absent due to reasons related to being dependent. This is a minor cause of absenteeism compared to employment. Similarly, 10 individuals are absent for reasons categorized as 'Others,' The data highlights that employment is the predominant reason for absenteeism, significantly outweighing other reasons. The national data shows that more than 66% of absentees are absent from their place of origin due to employment and wages followed by seeking a job (11%) and dependent (10%) (NSO, 2024). Similar results were also found by Jaquet et al. (2015) who claimed that most men were leaving rural to abroad or to urban areas of Nepal for labour work. The International Organization for Migration [IOM] (2019) describes there are various drivers of migration such as economic, demographic, environmental, social/political that lead people to migrate.

Destination Country of absentees

Among the 100 participants, more than one-third (41%) of the participants' destinations are Qatar. Similarly, Malaysia (17%), the United Arab Emirates and South Korea (10%) followed the next destinations. The national data shows that more than 37% of absentee

destinations were Middle East (Gulf) countries and most are the Kingdom of Saudi Arabia (KSA), Qatar and the United Arab Emirates whereas still 34% of absentees are in India (NSO, 2024).

Consequences due to outmigration at the place of origin

The impact of people being absent from their place of origin can vary depending on the context and the scale of absence. Here are some impacts that are reported by respondents.

Land use and land cover change in the study area

The study of changes in the land surface is known as land use and land cover change (LUCC). Land cover describes the biophysical features of the land surface, such as forests or deserts, but land use describes how land is used by humans, such as in agriculture, pasture or plantations.
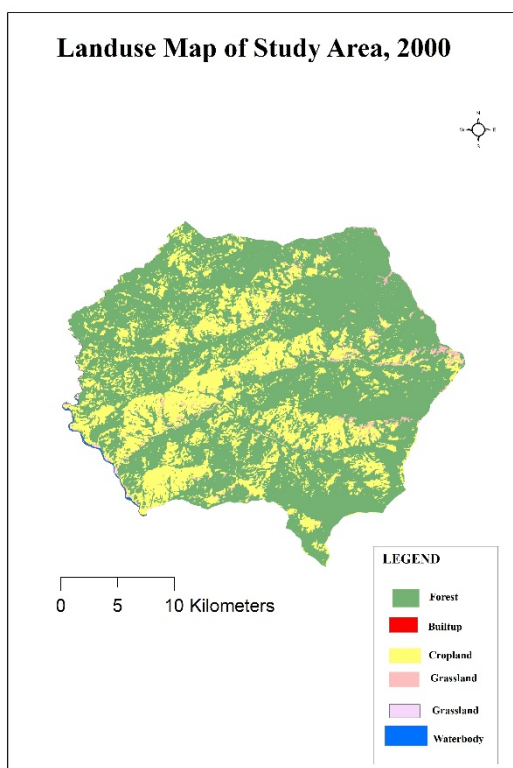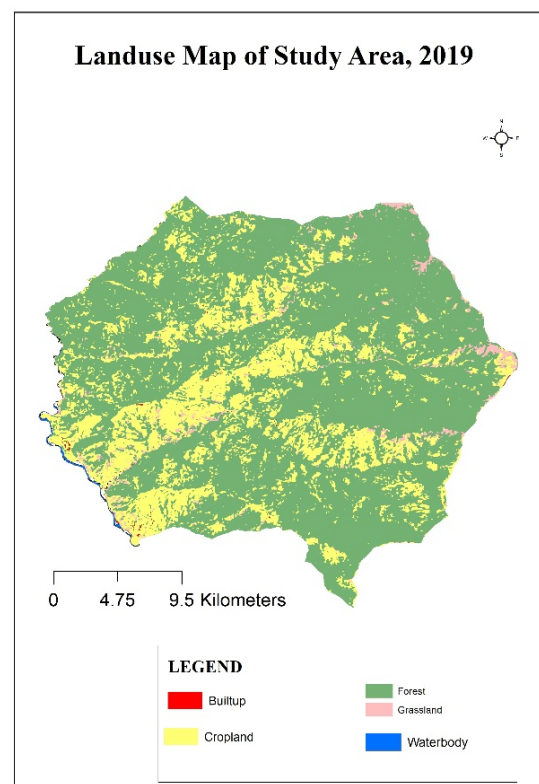
Figure 4: Land use map, 2000	**Figure 5: Land use map, 2019**

The land use and land cover maps are prepared from the data of the Forest Research and Training Center (FRTC) which are freely available by ICIMOD for two periods, 2000 and 2019. During the last 19 years from 2000-2019, mostly the cropland is changed to the forest

area. Altogether, 32.3 Sq. Km area was changed from cropland to forest area. Moreover, the forest area also changed into cropland and the area was 13.8 sq. km. The land use and land cover change detection were found with the help of GIS software techniques. The details of the land use and land cover changes are as follow:

Table 6: Land use and land cover change detection of the study area, 2000-2019

Land use types	Area Changes (In sq. km)
Built up-Built up	0.04
Built up-Grassland	0.009
Cropland-Built up	0.60
Cropland-Cropland	128.48
Cropland-Forest	32.32
Cropland-Grassland	0.96
Cropland-Other Wooded Land	1.33
Cropland-Riverbed	0.02
Cropland-Waterbody	0.02
Forest-Built up	0.03
Forest-Cropland	13.82
Forest-Forest	376.26
Forest-Grassland	4.69
Forest-Other Wooded Land	6.27
Forest-Waterbody	0.05
Grassland-Built up	0.02
Grassland-Cropland	0.88
Grassland-Forest	3.25
Grassland-Grassland	7.19
Grassland-Other Wooded Land	0.66
Grassland-Waterbody	0.03
Other Wooded Land-Cropland	1.34
Other Wooded Land-Forest	4.48

Other Wooded Land-Grassland	1.03
Other Wooded Land-Other Wooded Land	25.89
Riverbed-Built up	0.04
Riverbed-Cropland	0.11
Riverbed-Grassland	0.03
Riverbed-Riverbed	1.06
Riverbed-Waterbody	0.20
Waterbody-Cropland	0.02
Waterbody-Forest	0.01
Waterbody-Grassland	0.03
Waterbody-Riverbed	0.10
Waterbody-Waterbody	1.09
Grand Total	**612.65**

Source: FRTC, 2022

Land use dynamics are major impact in any areas due to the population dynamics in Nepal. Jaquet et al. (2015) assert that the Harpan Khola watershed in Nepal exhibits significant dynamism regarding population and land use/land cover changes. Chidi (2016) concluded that the loss of a significant portion of the population has led to a greater impact on the decrease of cultivated land, as cultivated areas are being converted into shrubs and grassland. Linkha (2024) highlighted that the land use land cover changes are the results of landslides and floods especially in the mountainous region.

Fallow land

Fallow land refers to agricultural land that is intentionally left uncultivated for a certain period to restore its fertility and allow natural processes to replenish soil nutrients. This practice can be part of crop rotation strategies or used in response to specific agricultural needs.

Table 7: Fallow land due to absentees

Fallow Land	**Number**	**Percentage**
Full Fallow	17	17
Partially Fallow	38	38
No fallow (No change)	45	45
Total	**100**	**100**

Source: Online Survey, 2024

The table provides data on the fallow status of 100 participants' land, divided into three categories: Not fallow, partially fallow, and Full fallow. Nearly half (45%) of the participants' land is not fallow, which indicates their land is still in use. This suggests that a significant portion of the land is being utilized. About 38% of the participants` land units are partially fallow. This implies that these lands are not fully utilized and may have some sections that are either underused or left idle. A smaller portion, 17%, of the participants` land is fully fallow, meaning their lands are entirely unused or left to rest. The majority of the participants (83%) land was used to some extent and 17 % of participants' lands were fully fallow. Understanding the reasons behind why land is partially or fully fallow could inform decisions on how to optimize land use, whether through improving agricultural practices, investing in irrigation, or other methods to increase cultivation efficiency. Chidi et al. (2024) claimed that the significant shortage of agricultural labour has led to the widespread abandonment of agricultural land. Furthermore, land abandonment occurs in Nepal in high-altitude areas, steep sloped and regions distant from villages (Chidi et al., 2024; Chidi, 2016). Similar results were also reported by Poudel et al. (2020) and mentioned that a higher proportion of land abandonment occurs mostly in the Hills and Mountains than in Terai of Nepal. The next study conducted by Jaquet et al. (2015) highlighted that depopulation results in various consequences such as land abandonment, the growth of invasive species, a decline in soil richness and a lack of terrace management.

Shifting place of residence

Following their departure from Nepal, absentees are more likely to move elsewhere and change their usual place of residence. According to the survey, about 59% of participants had shifted from southern Sankhuwasabha. The districts of Morang (21%) and Sunsari (13%) received a higher proportion of migrated people. So, the destination of migration from the Southern Sankhuwasabha reveals the districts of eastern Terai, especially at Morang and Sunsari. The study by Jaquet et al. (2015) also described that migrated families migrated downstream to be closer to the main facilities.

Other impact

The respondents expressed other numerous impacts emerged due to their absence. Both kinds of impacts such as positive and negative are found in their communities. Pandey (2008) explained that the heavy investment development projects in the Hilly district are becoming meaningless because of the lower number of users. The Impacts are as follows.

Table 8: Impacts at place of origin

Positive impact	Negative impacts
• Support to family members to further study (12) • Increased the income sources in the community (9) • Financial support for families' treatment (9) • Financial support to relatives and neighbors for foreign employment (7) • Donate to their community for social work such as school construction, road construction, managing drinking water and playground construction (6) • Financial support to relatives and neighbors for treatment (6) • Established any business and industry (2) • Acquire important skills and knowledge (2)	• Lack of human resources (17) • Due to a lack of lobby and advocacy, the development works are disturbed (8)

Source: Online Survey, 2024 (The figure of parenthesis indicates the number of respondents and the answers were multiple responses and not compulsory thus, it does not match with total number)

6. Conclusion

The provided data offers a detailed analysis of outmigration patterns, absentee purposes, fallow land status, and destination trends within four local levels (Pancha Khapan, Chainpur, Madi, and Dharmadevi) of Sankhuwasabah district over six years in the Nepali calendar (2075 to 2080 B.S.). There is a consistent pattern of higher out-migration as compared to in-migration across all four local levels. All local levels exhibit negative population growth rates, with Dharmadevi Municipality having the highest negative growth rate at -1.22%, followed by Madi Municipality at -0.83%. The district as a whole also has a negative population growth rate of -0.04%, as per the National Census Report 2021. Neighboring districts of Sanhuwasabah such as Bhojpur, Dhankuta, Terhathum, and Teplejung also show similar trends of the population with negative growth rates of -1.39%, -0.78%, -1.3%, and -0.53% respectively.

The data suggests a significant population decline in the four local levels of Pancha Khapan, Chainpur, Madi, and Dharmadevi, primarily driven by high out-migration rates for employment purposes. The negative population growth rates in these areas are reflective of broader regional trends, with neighboring districts also experiencing similar declines. The age distribution of the absent population indicates that middle-aged individuals (particularly those aged 35-39) are the most likely to migrate, which could have implications for the local workforce and economic development. Employment is the predominant reason for absenteeism, underscoring the need for local economic opportunities to retain residents. The destination countries for migrants are largely in the Middle East and Southeast Asia, indicating a reliance on foreign employment. Regarding land use, the relatively high level of

land utilization (82.7%) suggests that while some land is left fallow, a significant portion is still in use. However, addressing the reasons for partially and fully fallow land could enhance agricultural productivity.

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