National Sample Census of Agriculture Nepal, 2021/22

Report on Land Use

Government of Nepal

Office of the Prime Minister and Council of Ministers

National Statistics Office

Kathmandu, Nepal

January 2024

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PREFACE

Nepal has commenced to carry out the agriculture census since 1961/62. The seventh National Sample Census of Agriculture 2021/22 (NSCA 2021/22) is the first one after the new federal setup of the country. Its primary purpose is to provide data on the structural aspects of agriculture that change relatively slowly over time, such as the size of holdings, land use, land tenure, and irrigation up to the local level. The census follows standard international concepts, definitions and methodology as recommended by the FAO World Programme for the Census of Agriculture (WCA 2020) to address the quality data needs of the country and to ensure that data collected are comparable at the international level. The census provides benchmark data on agriculture which is essential for monitoring and evaluating the impact of development policies and programs and addressing emerging social, economic, and environmental policy issues in agriculture.

The NSCA 2021/22 is a sample census that covers the whole country. It is designed to provide precise estimates of major variables at the municipality level. The census captures the agricultural activities operated by the households within the cut-off threshold. The main fieldwork for data collection took place from April 19 to June 2, 2022. After a rigorous process of data processing and analysis, the outputs of the census are presented in various reports for the national, province, and local levels. Now this report compares land use outputs at the national and province levels that provides a comprehensive understanding of the agricultural landscape, facilitating informed decision-making at various administrative levels.

In this regard, I am extremely grateful to the Deputy Chief Statisticians for their overall guidance of this report. Directors of the agriculture and livestock census section deserve special thanks for their prime role in the successful completion of this report. I would like to thank Statistics Officers, Computer Officer and Statistics Assistant for their dedicated efforts to shape this report.

January, 2024

Toyam Raya
Chief Statistician
National Statistics Office

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PART I

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1. Introduction

The National Statistics Office, previously known as the Central Bureau of Statistics, conducted the National Sample Census of Agriculture 2021/22 (NSCA 2021/22) covering all parts of the country. Nepal has a glorious history of taking the agriculture census once every ten years since 1961/62. The NSCA 2021/22 is the seventh census in this cycle and the first one after the new federal setup of the country. Its primary purpose is to provide data on the structural aspects of agriculture that change relatively slowly over time. The census provides benchmark data on agriculture which is essential for monitoring and evaluating the impact of development policies and programs and addressing emerging social, economic, and environmental policy issues in agriculture. Land use data is one of the data collected in the census of agriculture based on the structural aspects of agriculture.

2. Objectives of Collecting Land Use Data

The main objectives of collecting land use data in the Census of Agriculture 2021/22 are:

i. To provide basic land use data on the structure of agriculture,

ii. To assist in planning and policy-making for appropriate land use across the three tiers of government and monitoring the progress achieved,

iii. To provide reliable data for benchmarking and reconciliation of current agriculture statistics on land use,

iv. To design frame for other agricultural surveys, especially focusing on land use,

3. Importance of Land Use Data

The production and productivity in the agricultural sector depends on land and its use. Proper use of land plays a vital role in increasing as well as sustaining agricultural production. Appropriate land use policy in the developing countries like Nepal can play a major role for food security, poverty reduction, sustainable agriculture and economic development. Sustainable agriculture supports the successful management of resources like appropriate use of land for agriculture to fulfill growing human needs while maintaining environmental balance and conserving natural resources. Sustainable Development Goals like goals to end poverty, and protect the planet and ensure prosperity initiated by the United Nations have a connection with the land, agriculture, and food security.

The Constitution of Nepal has set food sovereignty as a fundamental right for every citizen protecting peoples from food insecurity, unequal food distribution, and problem in food access. However, the food security situation is still not satisfactory. The situation can be improved making use of rich climatic variability in different ecological belts suitable for a verity of food crops, pulses, oilseeds, fruits, and vegetables. The Agricultural Development Strategy has also focused on increased food and nutrition security, poverty reduction, competitiveness, higher and more equitable income of rural

households, and strengthened farmers' rights. National Land policy 2019 has also included agenda to increase the access of agricultural land to farmers, classification of land-based on utility for sustainable use to increase food production. National agricultural policy 2004 included the conversion of substantial farming to commercialize and sustainable agricultural development, and scientific land use to stop fertile agricultural land to change other land use categories. Various provisions and programs are implemented by the government to strengthen the sustainability of the agriculture sector. However, decrease in agricultural land has brought the challenges for obtaining food security and meeting sustainability in agriculture.

The census of agriculture is the main source of data on the actual land use in any country. Information on land use from the census of agriculture is crucial to analyze agriculture sustainability and productivity.

4. Scope and Coverage

The purpose of the agriculture census is to collect information on the structure of the agricultural production industry, primarily at the household level. Regarding the land use as a content of the census, the census has adhered to the guidelines set forth by the World Program for the Census of Agriculture 2020 (WCA 2020) developed by the FAO. The scope of the census on the theme of land use mainly covers area under temporary crops, area under temporary meadows and pastures, and area under temporary fallow. Land under permanent crops, land under permanent meadows and pasture, land under farm buildings and farmyards, forest and other wooded land, ponds, and other land not elsewhere classified are some other types of land use. But it also includes holdings' land use on ancillary activities like forestry, fisheries, mushroom farming, beekeeping, floriculture, and nursey provided that they have some crop or livestock production activities within the cut-off threshold.

As in the past censuses, the seventh census of agriculture also covers the whole country capturing the land use and other agricultural activities operated by the holdings within the cut-off threshold. Only the land use of agricultural holdings operated by households is included. The land use activities of big-sized livestock farms above the predefined threshold operated by households and undertaken by government organizations, cooperatives, and business farms are excluded.

5. Statistical Unit

The statistical unit is the basic unit for which data are collected. The primary statistical unit of the seventh agricultural census for capturing the data on land use is the agricultural holding as for capturing the other agricultural activities.

6. Reference Period

The reference period for the data collected in the census for the area under different temporary and permanent crops was the calendar year 2021. But the area of land use by the holding was collected based on the day of enumeration.

7. Sampling Design

7.1 Domains of estimation

Nepal is divided into seven provinces, 77 districts, and 753 municipalities for administrative purposes. The NSCA 2021/22 provides accurate estimates for land use like other agricultural activities at the municipality level, making the 753 municipalities as domains of estimation for the sampling design.

7.2 Sampling method

The sampling method for estimation of land use like other parameters of interest at municipality level is one of stratified two-stage sampling. Within a municipality the enumeration areas (EAs) are the primary stage units (PSUs) of sampling and within the selected enumeration area the agricultural households are the second stage units (SSUs) of sampling. The enumeration areas are selected by probability proportional to size (PPS) systematic sampling (the number of holdings in the enumeration area is the size variable). The SSUs are selected by equal probability systematic sampling with implicit stratification.

7.3 Sampling frames

In line with the proposed sampling design, there are two types of sampling frame used for the agriculture census 2021/22: the frame for selecting the PSUs and the frame for the selection of agricultural holdings.

The sampling frame for PSUs was prepared from the list of enumeration areas (EAs) from the National Population and Housing Census 2021 (NPHC 2021). Following FAO recommendations an agricultural module was incorporated in the NPHC collecting basic agriculture related information from all households in the country including total area of operational holding, number of livestock, and number of poultry birds. The frame of PSUs consisted of the list of enumeration areas along with the number of households and agricultural households. The frame of PSUs included a total of 32099 enumeration areas.

The frame for SSUs was developed through listing operations in the sampled EAs. All households are interviewed in each EA in order to develop an updated list of agricultural households as sample frame of SSUs in the selected EA.

7.4 Sample size

The municipality is the sample domain of the census, therefore the sample size was determined ensuring reliable estimations of land use at municipality level as of other key variables of interest. As recommended by FAO, agricultural area is a suitable variable that is considered in calculating the sample size.

The target number of holdings sampled from each selected EA was set at 25. The actual number sampled varied between 20 and 30 and was determined in such a way to ensure equal probability of selection for all holdings in a municipality. Altogether, a sample of 330,112 holdings for the whole country (8% of all holdings) was selected from 13,576 EAs in the NSCA 2022.

7.5 Sample selection

The sample of PSUs was selected with a systematic probability proportional to size method considering the number of agricultural households as measure of size.

Selection of SSUs (agricultural households) were carried out in the field. The selection was done by using usual equal probability linear systematic sampling. However, before selection, an implicit stratification for Tarai and Hill/Mountain was used by making four implicit strata as follows:

- Less than 1 Bigha (0.68Ha)/10 Ropani (0.51Ha)
- 1 to 3 Bigha (0.68 to 2.03 Ha) /10 to 20 Ropani (0.51 to 1.01 Ha)
- More than 3 Bigha (2.03 Ha) / 20 Ropani (1.01 Ha)
- Only having livestock

7.6 Data collection method and questionnaires

A direct face-to-face interview method of data collection with a paper questionnaire and a system of Computer-Assisted Personal Interview (CAPI) method using tablet were used in the census. The CAPI system was used only in three districts – Kathmandu, Lalitpur, and Bhaktpur of Kathmandu valley. The paper questionnaire method was used for data collection in the remaining 74 districts.

Agriculture Holding Questionnaire (Form 2) was the main questionnaire implemented in the census to collect land use data from the selected (sample) holdings as other agricultural data. Form 2 is the main questionnaire implemented in the census to collect the agricultural data in detail from the selected holdings and institutional holdings.

7.7 Field Work

Unlike the past censuses, the seventh census of agriculture was conducted in a single phase across the entire country due to the COVID-19 pandemic. The main fieldwork - data collection for the census took place for 45 days between April 19 and June 2, 2022.

The filled-in forms collected from the fieldwork were checked and verified for completeness at the district census offices. Once verified, they were sent to the central storage for further processing.

7.8 Supervision

Officials at the central level, along with district census officers, assistant officers, and supervisors, were assigned to oversee and manage the fieldwork. Monitoring and supervision forms were utilized for this purpose. The progress of the fieldwork was regularly reported to both the district census office and the NSO.

7.9 Data Processing

The completed questionnaires collected from the various census offices were safely stored in the central storage building. Data processing for the census was done within the NSO premises. The data processing center of the NSO was equipped with basic facilities and functionalities like laptops, a local server, a local area network (LAN), security cameras, furniture, and air conditioners.

The coding and editing of the questionnaires were accomplished by the temporarily recruited 50 coders and editors from November, 2022 to January 2023. Likewise, the data entry was completed by 100 data entry operators from December, 2022 to February, 2023.

The data entry application was developed in CSPro which includes a comprehensive built-in system that has range and consistency checks programs. For data management, both SPSS and STATA packages were utilized. This involved editing, cleaning, and tabulation of data from the census. In situations where there was dubious information found during the data cleaning process, the agriculture holdings were contacted directly through phone calls or field visits for data verification. After ensuring the quality of the data, the statistical software package SPSS was predominantly used for data tabulation, analysis, and summarization of results.

7.10 Quality control

The NSO was highly focused on ensuring the accuracy of census data by implementing various measures to minimize non-sampling errors. To reduce sampling errors, an appropriate sampling design was prepared modifying the designs used in previous agriculture sample censuses. Quality control mechanisms for the data included training, supervision, completeness checks, verification of data entry, and consistency checks.

7.11 Limitations

- The results on land use are derived from the agricultural activities of the holdings that are within the cut-off threshold. The land use activities below the cut-off threshold are not included in the census.
- The results on land use do not include land use activities operated by non-household holdings (institutions, cooperatives, big commercial farms).

7.12 Organization of the report

This report on land use is composed of four parts. The Part I is the introductory section of the report. It presents the background, objectives, scope and coverage, statistical unit, reference period, sampling design, data collection tools and instruments, field work, supervision, data processing, and limitations of the census, especially focusing on land use.

Part II, describes the major findings of the census on land use at national level and province level. At these levels, some key outputs of the census on land use are compared with the results of past census. In this section the description is provided along with figures and charts for some key outputs of the census on this theme.

Part III, provides the statistical tables at national and province level on land use according to various sections of the questionnaire. The statistics provided through various tables presents detailed information of the census results on land use.

Part IV, presents the definitions of various technical terms on land use as used in the census.

PART II

Major Findings

This part describes the major findings of the census of agriculture 2021/22, with a focus on land use. Some comparative study has also been carried out based on inter and intra census findings. A comparative study has been conducted, both within the same census (intra-census) and between different censuses (inter-census). Additionally, implications of the findings are discussed, specifically for planners, policy makers, and general users. Discussion on major findings has also paved the way for the further study and research in this sector.

1 Number and Area of Holdings

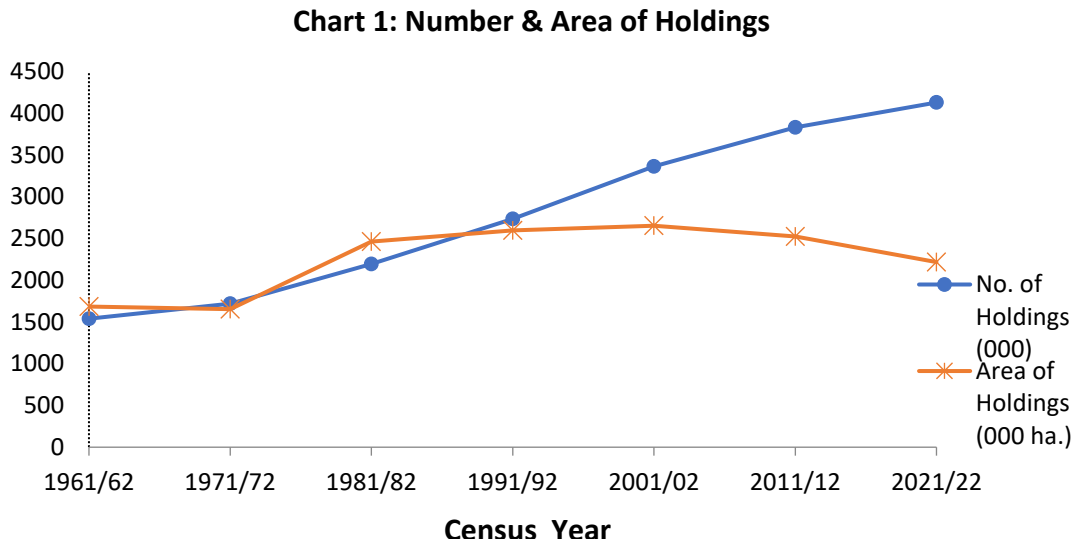
The information provided from the Census of Agriculture 2021/22 in Nepal, one can come to highlighting trends in the number of holdings and the corresponding changes in the area under cultivation. The Census of Agriculture 2021/22 also covered both the holdings with land and holdings without land (holding rearing only livestock) as in the past censuses. Holdings with land are those cultivating 0.01 ha. or more land. Holdings without land are those with at least one big head or 5 small heads or 20 birds (as mentioned in part IV under 'Definitions of Terms Used') and less than 0.01 ha. of land under cultivation. The Census of Agriculture 2021/22 has reported 4,130,789 holdings including 3,999,285 holdings with land and 131,504 holdings without land in Nepal.

The first Census of Agriculture 1961/62 reported 1540 thousand holdings in Nepal. The number increased to 3360 thousand in 2001/02. It has further increased to 4130 thousand in 2021/22. Over a 60-year period, there has been a huge growth of 168 percent in the number of holdings. The total area of holdings increased from 1680 thousand hectares in 1961/62 to 2650 thousand hectares in 2001/02. However, there has been a continuous decrease in the area under cultivation since 2011/12. The area has decreased from 2520 thousand hectares to 2220 thousand hectares in the last 10 years as shown by last two censuses (2011/12-2021/22).

Despite 8 percent increase in the number of holdings, there has been 12 percent decrease in the total area of holdings during the last two censuses. The area under holdings increased by only 32 percent over the sixty-year period though the number of holdings increased by 168 percent during the same period. The recent trend of the last two censuses shows a discrepancy as the number of holdings increased by 8 percent, but the total area of holdings decreased by 12 percent.

These trends suggest changes in agricultural practices, land use, or economic factors influencing farming in Nepal over the years. It requires further analysis to understand the factors driving these trends and their implications for the agricultural sector in Nepal.

Chart 1: Number & Area of holdings, Nepal 1961/62-2021/22



When examining land use patterns across the provinces of Nepal, Koshi Province emerges with the highest total area of holdings and then followed by by Madhes Province, Lumbini Province, Bagmati Province, Gandaki Province, Sudurpaschim Province, and Karnali Province. This sequence is also observed in the distribution of agricultural land. Notably, Madhes Province stands out with the largest area of arable land, constituting approximately one-fourth of Nepal's total arable land. The remaining provinces show a consistent pattern, with Karnali Province having the smallest share. Detailed information on land utilization across these provinces is provided in the subsequent tables, with a comprehensive insight into the diverse agricultural landscapes within the country.

Table 1: Area of Holding by Land Use Category by Province, Nepal 2021/22

Discription	Nepal	Provinces						
		Koshi	Madhes	Bagmati	Gandaki	Lumbini	Karnali	SudupPaschim
Total area of holdings	**2218.4**	**532.9**	**492.5**	**282.3**	**173.8**	**426.6**	**117.4**	**192.9**
Agriculture Land	**1984.4**	**463.6**	**458.6**	**250.7**	**150.9**	**382.4**	**104.6**	**173.8**
Arable Land	**1803.6**	**398.7**	**437.1**	**233.2**	**126.4**	**348**	**96.9**	**163.4**
Land under temporary crops	1730.9	381.4	429.2	219.4	114.6	336.2	92	158.1
Land under temporary meadow & Pastures	12.2	2.7	2.3	1.9	1.4	1.8	0.9	1.3
Land under temporary fallow	60.5	14.6	5.6	11.9	10.4	10	4	4
Land under permanent crops	145.4	56.3	19.4	11.9	16.2	29.4	5.7	6.7
Land under permanent meadow and pastures	35.4	8.6	2.1	5.6	8.3	5	2	3.7
Non-agriculture land	**234**	**69.3**	**33.8**	**31.7**	**22.9**	**44.3**	**12.77**	**19.2**
Land under farm building & farmyards	137.2	34	23.6	19.5	11.6	26.1	9	13.4
Forest and other wooded land	80.7	32.4	2.6	11	10.5	15.3	3.6	5.2
Pond land	12.9	2.1	7	0.8	0.4	2.1	0.1	0.5
Other area not alsewhere classified	3.2	0.8	0.6	0.4	0.4	0.8	0.07	0.1

2 Dry Land and Wet Land

The information from the Census of Agriculture 2021/22 focuses on the categorization of land into wet land and dry land, indicating changes in their respective areas over the past 10 years. The Census of Agriculture 2021/22 result has shown 1,429,981 hectare of wet and 788,429 hectare of dry land out of the 2,218,410 hectare of total land. As the total land has decreased, wet and dry land has also decreased by 10 and 16 percent respectively as compared to the previous census.

Table 2: Number and area of land/holding by type of land and size of holding, Nepal 2011/12 - 2021/22

Total area of holding	Holdings 2021/22				Holdings 2011/12			
	Number	Area (ha)			Number	Area (ha)		
		Wet	Dry	Total		Wet	Dry	Total
Holdings without land	**131,504**	**5,361.2**	**3,051.6**	**8,412.8**	115,538	990.4	2,128.9	3,119.3
Holdings with land	**3,999,285**	**1,424,619.4**	**785,377.7**	**2,209,997.1**	3,715,555	1,583,217.9	939,302.1	2,522,519.9
Under 0.1 ha	425,218	14,676.1	10,833.2	25,509.3	355,549	10,033.3	10,043.2	20,076.5
0.1 ha and under 0.2 ha	648,450	53,337.0	42,962.3	96,299.3	461,957	35,336.5	32,825.3	68,161.8
0.2 ha and under 0.5 ha	1,430,114	279,357.9	198,832.7	478,190.5	1,169,503	212,482.3	184,238.6	396,720.9
0.5 ha and under 1 ha	945,304	416,995.9	243,207.2	660,203.1	984,022	394,388.5	300,671.6	695,060.1
1 ha and under 2 ha	427,039	385,539.1	190,807.6	576,346.8	548,974	481,111.7	268,698.3	749,810.0
2 ha and under 3 ha	81,948	138,135.3	56,095.4	194,230.8	129,364	225,777.7	82,790.8	308,568.5
3 ha and under 4 ha	25,963	64,765.9	23,602.7	88,368.6	39,507	100,804.6	33,548.5	134,353.1
4 ha and under 5 ha	7,397	24,621.7	8,178.0	32,799.7	14,881	51,070.8	14,293.9	65,364.7
5 ha and under 10 ha	6,979	36,971.4	7,921.5	44,892.9	10,744	58,706.1	10,471.0	69,177.1
10 ha and over	875	10,219.2	2,937.0	13,156.1	1,054	13,506.3	1,720.9	15,227.2
Total	**4,130,789**	**1,429,981**	**788,429**	**2,218,410**	**3,831,093**	**1,584,208**	**941,431**	**2,525,639**

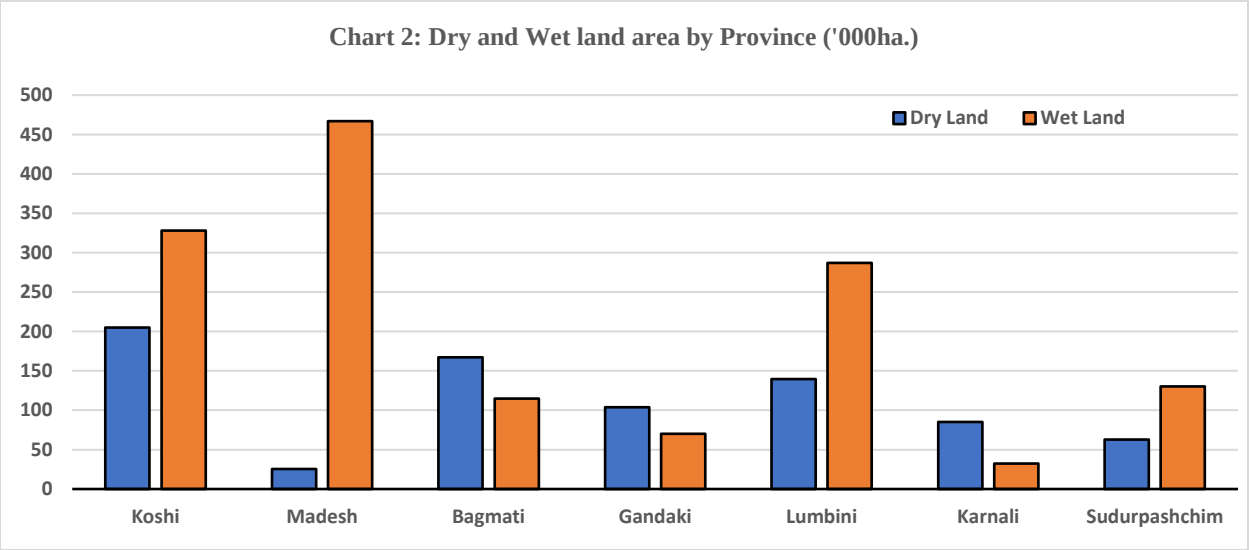
The overall decrease in total land and the corresponding impact on both wet and dry land suggest significant changes in land use, agricultural practices, or other factors affecting land availability. The specific reasons for these changes would require further study, as various factors such as urbanization, environmental changes, or shifts in agricultural practices could contribute to alterations in land use trend.

The percentage decrease in dry land (16 percent) is more substantial than that in wet land (10 percent) over the specified period. Changing trend in wet and dry land can be crucial for policymakers, researchers, and stakeholders in agriculture to develop strategies and adopt interventions to address potential challenges. There is a significant increase in dry land operated by small holders with less than 1 hectare of land and conversely, a decrease in dry land area is observed among medium and large landholders in the last 10 years.

Overall, this information provides insight into the changing dynamics of land use in Nepal, particularly in terms of wet and dry land, emphasizing the need for further analysis to understand the underlying causes and potential implications for the agricultural sector and beyond.

Examining the distribution of wet and dry land across the provinces shows distinctive patterns. Madhes Province has the highest share of wet land, leading the provinces, succeeded by Koshi,

Lumbini, Bagmati, Sudurpaschim, Gandaki, and Karnali. In contrast, Karnali has the smallest portion of wet land. Conversely, Koshi Province dominates in terms of dry land, with Bagmati, Lumbini, Gandaki, Karnali, and Sudurpaschim following in descending order. Notably, Madhes Province exhibits a significant ratio of wet to dry land whereas Bagmati and Gandaki provinces showed a comparatively lower ratio.



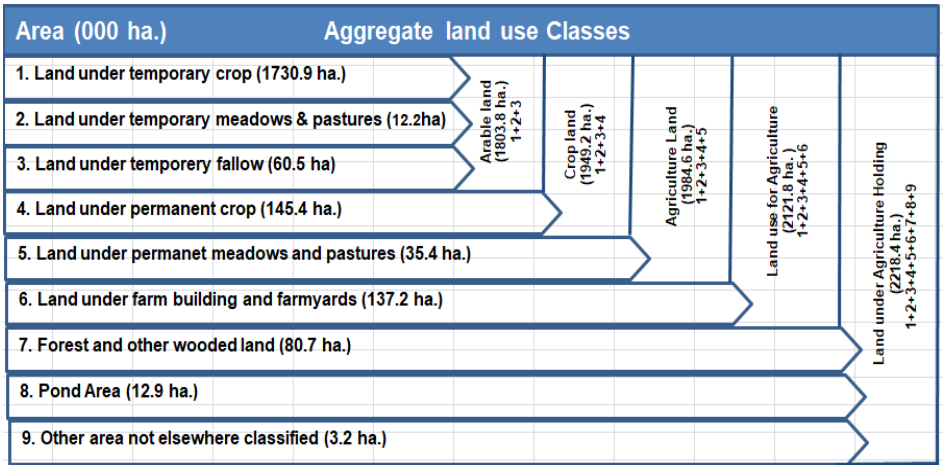
3 Land Use

Land operated by the holding is classified into two major categories: agricultural land and non-agricultural land. Agricultural lands are further divided into two main categories: crop land and land under permanent meadow and pastures. Crop land is subdivided into two categories: Arable land and Land under permanent crops. Arable land consists of land under temporary crop, land under temporary meadows and pastures and land under temporary fallows. Non-agricultural lands within the holding include: Land under farm buildings and farmyard, forest and other wooded land, ponds and other area within the holding that is not classified elsewhere.

This classification system provides a comprehensive overview of the major types of land use within agricultural holdings, distinguishing between areas used for crop cultivation and ponds, and non-agricultural purposes such as woodlands or undeveloped land requiring some more efforts for cultivation. It helps in understanding the diversity of land utilization and the potentiality for various productive and non-productive activities within the holding.

The detail distribution of land use is given below.

Chart 3: Aggregate land use classes in Nepal, 2021/22



According to the recent agriculture census 2021/22, 2,218,409.9 hectares of land were operated by agriculture holdings. 95.6 percent (2.12 million hectares) of the total land was used for agriculture. 80.7 thousand hectares were covered with forest and other wooded land, showing a significant increase of 46.9 percent compared to the previous Census of Agriculture. 12.9 thousand hectares were used for ponds, which is more than three times the previous census. The remaining 3.2 thousand hectares were classified as other land, either unused or underdeveloped but potentially usable for agricultural activities with some more human effort.

The majority of agricultural land, 1,730.9 thousand hectares, was used for temporary crops as shown by the Census of Agriculture 2021/22. The area under permanent crops was 145.4 thousand hectares, indicating a decrease in both the areas of temporary and permanent crop. Over the last ten years, there has been a decrease in the land used for temporary crops by 392,316 hectares (18.5%) and for permanent crops by 23,093 hectares (13.7%). The land under temporarily fallow has almost doubled, reaching more than sixty thousand hectares in the 2021/22 census. This information provides insights into the changing scenario of land use, with shift in areas allotted to different types of crops and other land uses.

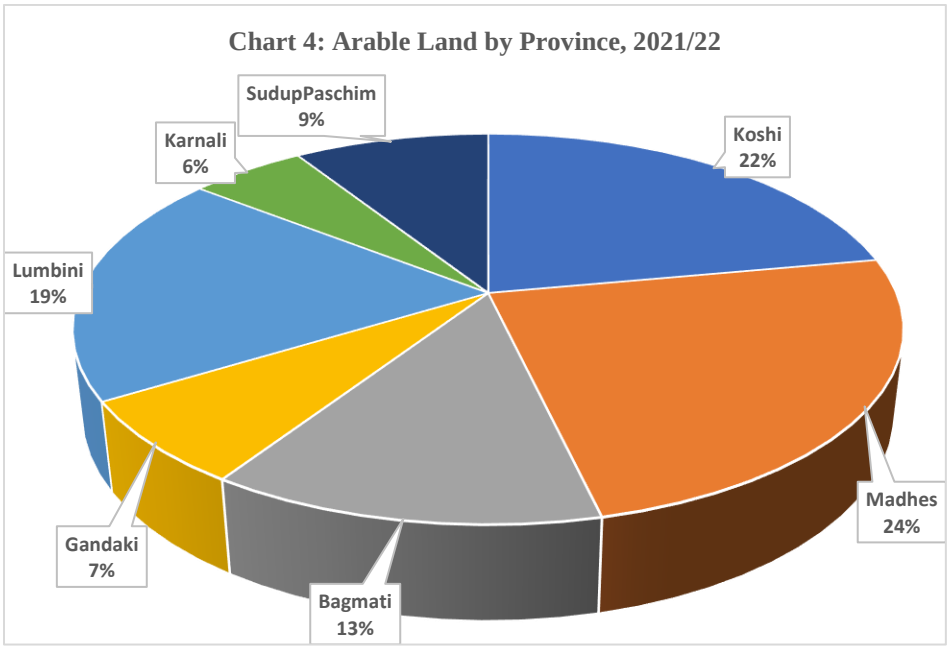
3.1 Arable Lands

It is obvious that arable land plays a crucial role in achieving food self-sufficiency in Nepal. The slight decrease in arable land between 2011/12 and 2021/22 reflects the importance of maintaining and potentially expanding such land. Let's break down the three categories of arable land mentioned: This category is considered the most important as it represents the physical area where annual crops are grown during a specific period. The ability to use the land for multiple cycles, especially for short-growing crops like vegetables, enhances its productivity.

Meadows and pasture typically refer to areas covered with grass or other non-woody vegetation that are used for grazing livestock. Temporary meadows and pasture suggest that these areas might be rotated or changed based on agricultural needs. Fallow land is left unplanted for a specific period to allow it to restore fertility. Temporarily fallow land indicates a planned rotation of land to maintain soil health and productivity. The fact that the majority of arable land is used for temporary crops highlights the importance of crop rotation and efficient land use to sustain agricultural productivity. In

a country like Nepal, where food self-sufficiency is a critical goal, managing and optimizing arable land becomes crucial for maintaining a stable food supply.

Efforts to monitor and potentially increase arable land should be aligned with sustainable agricultural practices to ensure long-term productivity without depleting the soil or causing environmental degradation. Balancing the needs of food production with ecological sustainability is a key for the continuous growth of agricultural sector in Nepal.

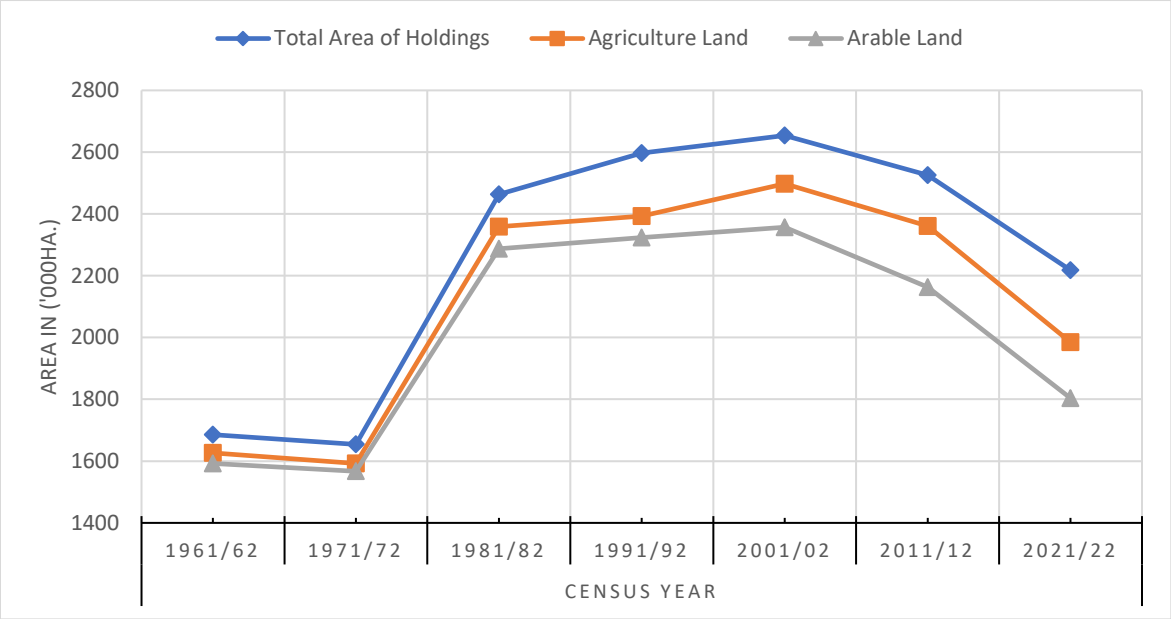


Arable land in Nepal occupies approximately 1.803 million hectares (12 percent) of the total land area of 14718 thousand hectares in 2021/22. Madhesh Province reported the largest arable land area, totaling 437,203 hectares and is followed by Koshi Province (398,773 hectares). Karnali Province reported the lowest proportion of arable land, amounting to 96,934 hectares.

The geographical distribution of arable land is influenced by the topography, with the Tarai belt being a low flat land in the southern part of the country, embodying more arable land. These findings provide insights into the distribution and changes in arable land across different provinces in Nepal, highlighting the importance of considering geographical factors in understanding land use patterns.

The historical trends in land distribution over the past 60 years reveal a consistent pattern across the various types of land, including total holdings, agriculture land, and arable land. Notably, when there is a decrease in the area of holdings, there is a corresponding decline in both agriculture land and arable land. Conversely, from 1971/72 to 1981/82, there was an overall increase in all types of land. However, from that point onward, there has been a continuous and notable decrease in land areas. The most significant decline occurred in the last decade, spanning from 2011/12 to 2021/22.

Chart 5: Area of land holdings by Land use, Nepal 1961/62-2021/22



3.1.1 Temporary Crop

The available information highlights a steady and significant decrease in the land under temporary crops in Nepal over the past two decades, particularly focusing on the years 2001/02, 2011/12, and 2021/22. The recent census gives an overview of the composition of agricultural land in Nepal, specifically focusing on the category of temporary crops. The agricultural land of the holding in Nepal is composed of various categories, including arable land, land under permanent crops, land under permanent meadows and pasture. Temporary crops play a dominant role in arable land.

In 2001/02, the land under temporary crops was 2,326 thousand hectares. By 2011/12, it was decreased to 2,123 thousand hectares, representing 8.7% fall as compared to 2001/02. The land under temporary crops further decreased to 1,731 thousand hectares by 2021/22, indicating a significant additional decline of 392 thousand hectares (18.5%) as compared to 2011/12. The data shows a consistent downward trend in the land under temporary crops, with decline both in the short term (2011/12-2021/22) and the long term (2001/02-2021/22). The decline between 2011/12 and 2021/22 is more noticeable, with an 18.5% decline over the ten-year period. The information reveals that crops such as rice, maize, wheat and millet are important crops among the cereal crops grown in the country. Additionally, legumes and oilseeds are found to be other important temporary crops.

The decline in the land under temporary crops may have various implications, including potential shifts in agricultural practices, changes in crop preferences, or broader economic factors influencing farming. The dominant role of cereal crops like rice, maize, and wheat as well as significant presence of legumes and oilseeds suggest that the changes observed may have specific implications for food security, market dynamics, and the overall agricultural scenario.

It requires further analysis to explore the reasons behind the decrease in land under temporary crops, considering the factors such as change in agricultural policies, climatic condition, market demand, or shifts in farming practices. This information provides valuable insights into the evolving agricultural

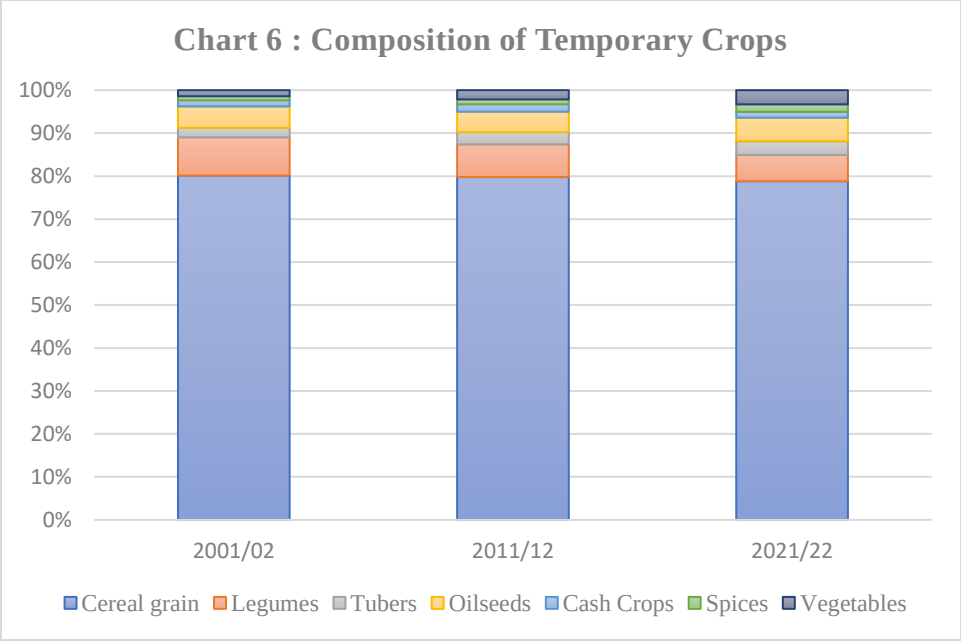
scenario in Nepal and can serve as a basis for more in-depth investigation into the underlying causes of these trends.

Table 3: Holding Reporting Cereal Crops, 2001/02-2021/22

Description	2001/02	2011/12	2021/22
Arable Land ('000ha)	2357	2163	1804
Land under Temporary Crop('000ha)	2326.1	2123	1731
Cereal grain	3423.1	3122	2586
Legumes	379.4	298	200
Tubers	92.5	111	105
Oilseeds	214.2	186	180
Cash Crops	60.6	68	45
Spices	40.7	44	57
Vegetables	60	84	108

In 2021/22, land under temporary crops comprised 78% of the total area of the holding, totaling 1.73 million hectares.

Annual crops included in the census comprise cereal grains, legumes, oilseeds, vegetables, fruit vegetables, root crops, bulbs, and cash crops. The census reported the actual area planted for each temporary crop. A parcel of land under temporary crops can be counted multiple times based on the number of times it was planted and harvested during the reference year. Cropped area may equal or exceed the physical area of the land under temporary crops, considering multiple planting and harvesting cycles.



Land used for producing cereal grain is still dominant in Nepal as compared to other temporary crops though its area is gradually decreasing while comparing the results of three succeeding censuses. Area

under cereal grains is 2,586,183 hectares as reported by the Census of Agriculture 2021/22. It was 3,121,885 hectares as revealed by the previous census. Madhesh Province is the top and Karnali Province is the least cereal grains producing province in area. Similarly, area under leguminous grains, tubers and bulb crops, oil seeds, and cash crops has also decreased in the last ten years.

Table 4: Number, area of holdings, number of holdings reporting and area under temporary crop by Provinces, 2021/22

District by province	Cereal crops		Leguminous grains		Tubers and bulb crops		Oil seeds		Cash crops		Spices		Vegetables		Grass crops		Other temporary crops	
	No. of holdings	Area (ha)	No. of holdings	Area (ha)	No. of holdings	Area (ha)	No. of holdings	Area (ha)	No. of holdings	Area (ha)	No. of holdings	Area (ha)	No. of holdings	Area (ha)	No. of holdings	Area (ha)	No. of holdings	Area (ha)
Nepal	3,873,854	2,586,183.0	1,823,910	199,844.8	1,895,367	104,737.8	1,219,356	180,141.1	119,880	44,609.3	1,824,094	56,893.5	1,977,571	107,733.8	176,440	16,436.3	28,214	2,226.2
Koshi Province	705,387	546,185.7	312,678	39,569.3	431,561	27,584.1	195,627	39,407.5	24,778	5,606.7	396,934	14,215.1	471,885	26,715.5	36,595	3,596.1	5,271	490.6
Madhesh Province	663,670	667,552.3	236,572	55,675.4	132,035	11,213.0	112,737	18,977.3	45,711	29,261.8	103,846	6,746.3	109,203	14,255.3	7,353	707.7	1,437	144.6
Bagmati Province	631,174	316,498.3	304,566	20,545.7	309,542	26,749.9	183,764	31,806.8	10,184	197.5	391,230	10,365.3	450,487	29,111.0	23,377	3,305.5	10,997	912.3
Gandaki Province	395,310	165,195.0	211,275	13,165.7	241,536	8,932.2	108,853	14,311.2	9,811	445.6	260,580	5,439.2	285,123	11,433.2	24,719	2,421.6	3,548	230.0
Lumbini Province	739,496	511,178.0	388,616	44,965.4	400,375	15,057.6	382,429	57,798.5	11,541	2,921.3	327,119	10,104.9	363,129	16,587.8	44,113	4,342.4	3,551	270.5
Karnali Province	297,460	133,355.3	152,393	12,347.4	141,338	7,261.1	70,065	4,621.7	1,866	28.9	107,779	4,186.9	81,475	3,311.8	1,774	122.9	403	20.0
Sudurpaschim Province	441,357	246,218.4	217,810	13,576.0	238,979	7,939.9	165,881	13,218.2	15,989	6,147.5	236,606	5,835.9	216,267	6,319.2	38,509	1,940.1	3,006	158.2

The census has shown good results in spices and vegetable crops as the area of both crops has increased as compared to the previous census. Koshi Province is top spices producing and Bagmati Province is top vegetable producing province in terms of area.

Decrease in total area of temporary crops also resulted in decrease in the area of these crops. Gradual decrease in the area of major temporary crops requires intervening policies and programs to increase production and productivity for overcoming food insufficiency. Similarly, the low image of Karnali Province in almost all crop production demands focused programs to solve the problem of food shortage and to end hunger.

The practice of single cropping in the case of temporary and permanent crops has decreased by 18 and 20 percent respectively in the last ten years. Contrarily, the practice of mix cropping (cropping of two different temporary or permanent crops in the same parcel simultaneously) has increased by 24 and 81 percent in the case of temporary and permanent crops respectively in the same period though the area used for such practice is not significant. Similarly, practice of associative cropping (cropping of temporary and permanent crops in the same parcel simultaneously) has been drastically increased being doubling the practice. It indicates the diversification in farming. It shows that farmers are more allured to produce multiple crops in the same parcel and same season though the area used for such practice is not significant.

Table 5: Number, area of holdings and crop stand by Provinces, 2021/22

District by province	Total		Crops under pure stand				Crops under mixed stand				Associated crops	
			Temporary		Permanent		Temporary		Permanent			
	No. of holdings	Area (ha)	No. of holdings	Area (ha)	No. of holdings	Area (ha)	No. of holdings	Area (ha)	No. of holdings	Area (ha)	No. of holdings	Area (ha)
Nepal	4,130,789	2,218,409.9	3,950,443	3,024,955.1	844,790	125,686.0	1,031,139	270,361.5	139,954	17,688.9	25,096	5,477.0
Koshi Province	786,108	532,937.2	731,924	658,429.1	217,518	49,724.8	162,584	44,133.8	33,848	6,106.5	4,002	1,280.7
Madhesh Province	738,340	492,497.1	683,130	756,692.8	117,682	16,144.6	106,471	47,319.7	21,464	3,018.8	1,806	745.0
Bagmati Province	668,177	282,292.2	644,851	397,583.0	99,370	10,164.4	191,845	41,529.5	16,215	1,538.5	2,665	556.3
Gandaki Province	412,677	173,773.0	401,973	198,466.8	118,029	14,106.5	113,464	22,707.4	15,181	1,855.7	2,579	632.2
Lumbini Province	765,092	426,614.5	746,178	600,884.1	163,097	25,636.7	220,794	62,043.0	27,159	3,585.4	1,792	456.4
Karnali Province	302,640	117,410.9	294,708	145,583.7	59,167	4,325.2	82,767	18,694.7	10,440	663.3	10,749	1,654.6
Sudurpaschim Province	457,756	192,884.9	447,678	267,315.6	69,928	5,583.7	153,214	33,933.4	15,646	920.7	1,503	151.8

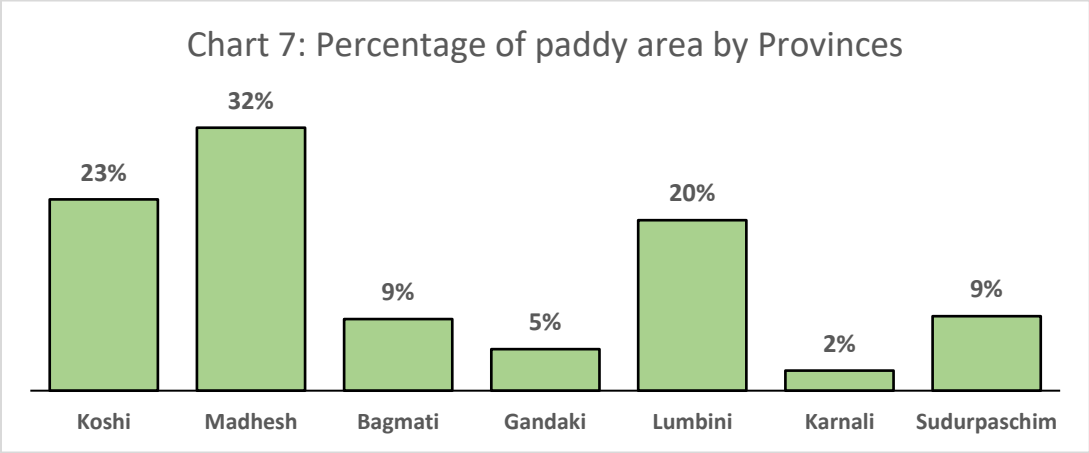
Paddy

The information provided by the census gives a detailed overview of paddy cultivation in Nepal, emphasizing changes in the number of holdings, cropped area, and average farm size over a decade. Paddy remains the most popular cereal grain in Nepal, cultivated by more than two-third of the holdings.

The number of holdings engaged in planting paddy has increased for all three seasonal paddy- early paddy, main paddy, and upland paddy. The holdings cultivating early and main paddy are increased by 17 percent, and 3.5 percent respectively but the holdings cultivating upland paddy are decreased by 39% in the last 10 years.

The total cropped area utilized for rice cultivation was 1.216 million hectares in 2021/22, representing 47% of the total cropped area of cereal grains.

Overall, the information provides a comprehensive picture highlighting the significance of paddy cultivation in Nepal. It also reflects the changes in the number of holdings, cropped area, and average farm size over the specified time period. The data also highlights regional variation in paddy cultivation and utilization rates.

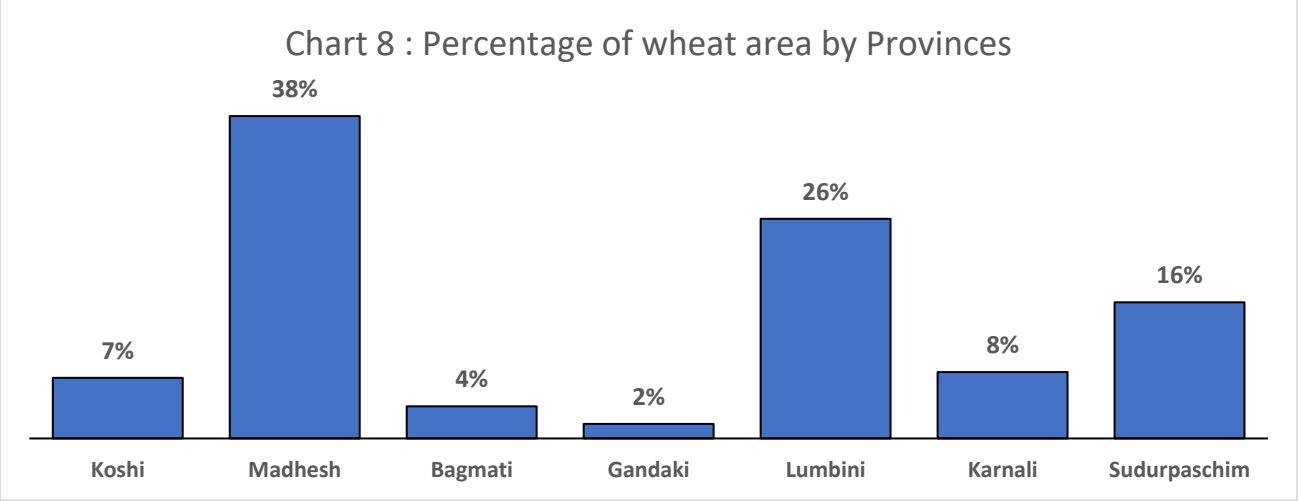


The information provides details of distribution of paddy cultivation across provinces in Nepal, emphasizing the cropped area. Madhesh Province reported the largest share of paddy cultivation with 32 percent of the total area of paddy cultivation, while the Koshi Province had 23 percent and is followed by Lumbini province with 20 percent. Comparing the area of paddy cultivation in the two consecutive censuses, the decline was 16.4 percent from 1455 thousand hectares in 2011/12 to 1216 thousand hectares in 2021/22.

Wheat

Wheat has been an important cereal grain during the past two decades. In 2021/22, there were only 2049 thousand holdings (49 percent of the total holdings) cultivating wheat as temporary crops out of the total area of 2218 thousand hectares. The wheat area also decreased over the last decade.

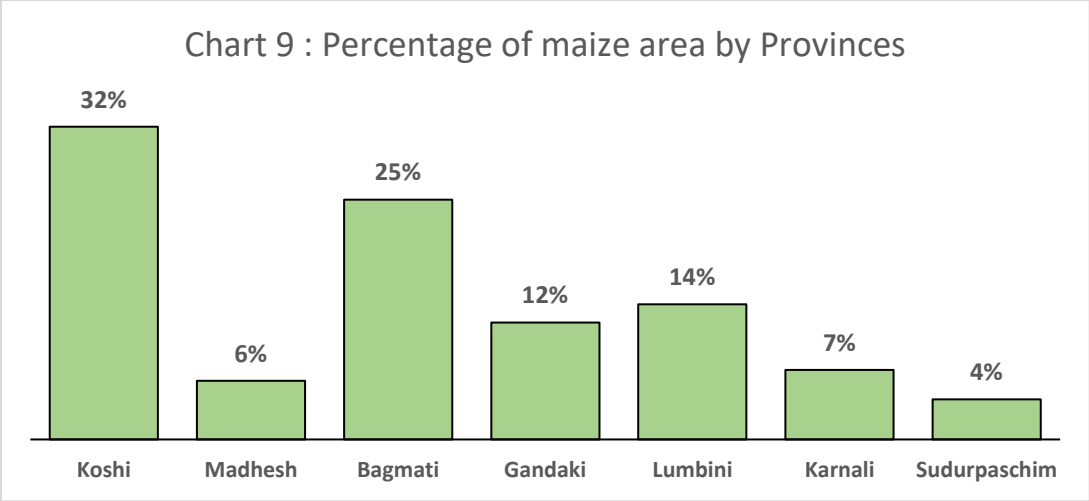
Among the cereal grains, wheat is another major crop after paddy and maize in Nepal. Relative to the area of arable land, the area of wheat cultivation is going down for all the provinces. Again Madhesh province reported the highest (38%) wheat area in hectare while the Lumbini reported the second highest (26%) and is followed by Sudurpaschim (16%). The rest of the four provinces almost equally shared in the area of wheat.



Maize

Maize is the second major crop after paddy both in the number of holdings cultivating and the area cultivated. As shown by the Census of Agriculture 2021/22, there were more than 2 million holdings that reported maize cultivation. This number represents more than 50 percent of the total holdings with land under temporary crops. The total crop area used for maize cultivation was 560 thousand hectares in 2021/22 which is 32 percent of the total cropped area in the same year. But the cropped area reported for maize by the Census of Agriculture 2011/12 was slightly higher with 674 thousand hectares- a difference of 114 hectares.

Koshi Province reported 32 percent of the total area of maize in Nepal and is followed by Bagmati province by 25 percent. Of the total 560 thousand hectares of maize area in Nepal, Lumbini, Gandaki, Karnali, Madhesh and Sudurpaschim represented 14, 12, 7, 6 and 4 percent land respectively.

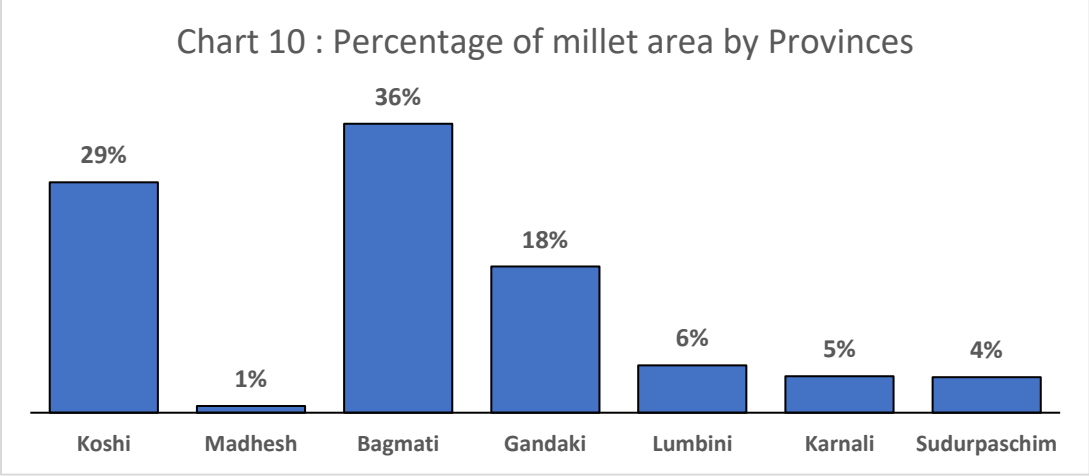


Millet

Millet is important crop in the hill and mountain regions. The total crop area used for cultivating millet was 200,949 hectares as shown by the Census of Agriculture 2011/12. But it has decreased to 122,113 hectares as reported by the recent Census of Agriculture 2021/22. The total crop area used for millet cultivation is gradually decreasing. It was 6.4 percent of the total area of cereal grains as shown by the previous census. It is further confined to 4.7 percent as revealed by the latest Census of Agriculture 2021/22.

Bagmati Province reported 36 percent of the total area of millet in Nepal and is followed by Koshi province by 29 percent. Of the total 122 thousand hectares of millet area in Nepal, Gandaki, Lumbini, Karnali, and Sudurpaschim represented 18, 6, 5, and 4 percent land respectively.

The gradual decrease of cultivating millet requires intervening policies and programs for its promotion as it considered to be nutritious and beneficial food for many modern diseases from which even a youths are suffering from.

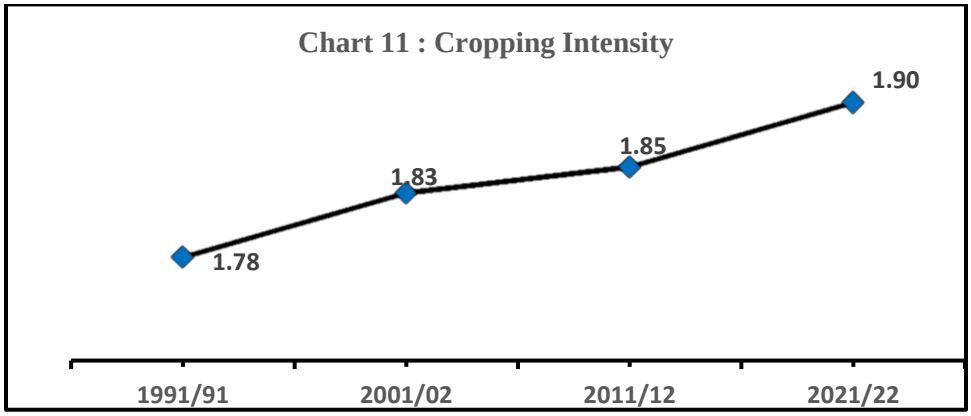


Cropping Intensity

Cropping intensity is a measure of how intensively a piece of land is used for farming, and it is calculated by considering the number of crops harvested from the same plot of land in a given agricultural year. It appears that there is a positive trend in cropping intensity in Nepal, as indicated by the continuous increase in the cropping intensity rate over the census years.

The census history indicates a continuous increase in cropping intensity over the years. The most recent census in 2021/22 reports a cropping intensity rate of 1.9. Despite a decrease in the area of temporary crops, the land is being more intensively used for farming. The trend suggests that farmers are cultivating and harvesting multiple crops from the same parcel of land within a single agricultural year. Higher cropping intensity can contribute to increased agricultural productivity and overall farm output. It may indicate improved farming practices, such as multiple cropping or more efficient use of land resources.

The census serves as a valuable tool for tracking changes in cropping intensity over time, providing insights into agricultural practices and land utilization. Overall, the increasing trend in cropping intensity suggests a positive development in agricultural practices in Nepal, with farmers making more efficient use of their land by cultivating multiple crops in a single year. This can have implications for food security, income generation, and sustainable agriculture.



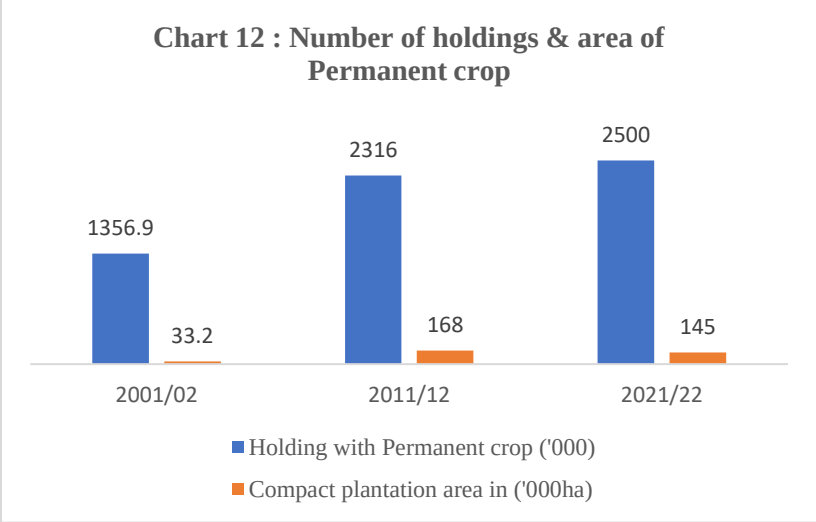
3.1.2 Permanent crop

The provided information highlights the trends in the cultivation of permanent crops in Nepal, focusing on the number of holdings, types of crops, and their distribution. Permanent crops, as defined in the Census of Agriculture 2021/22, include all fruit trees, tea, and other crops such as thatches, fodder trees, and bamboos. These crops do not need to be replanted for several years after each harvest.

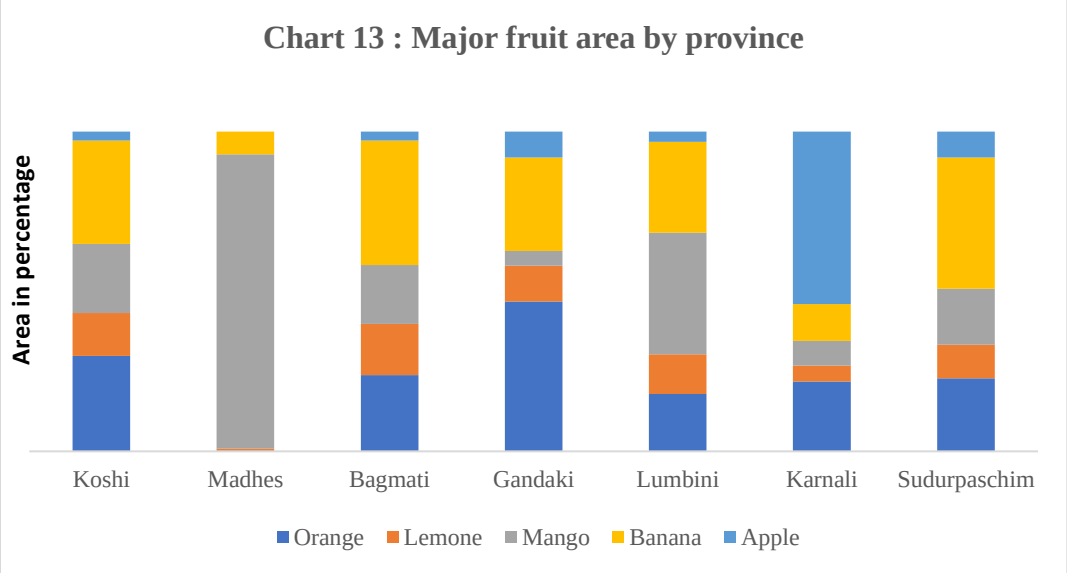
There has been a continuous increase in the number of holdings reporting permanent crops over the years. Between 2011/12 and 2021/22, there was an increase of 8% in the number of holdings reporting permanent crops.

The area under compact plantation slightly decreased. Over the two censuses from 2011/12 to 2021/22, the area decreased by 13.7%. Mango was the most common permanent crop, with 19.8 thousand

hectares reporting its cultivation in 2021/22. Banana was the second most popular fruit with 7.9 thousand hectares, and then orange with 6.5 thousand hectares, apple with 3.1 thousand hectares, and lemon with 2.8 thousand hectares. In addition to mango, banana, oranges, apple and lemon, other fruit trees with a significant number of holdings growing them in 2021/22 includes guava, plum, lime, papaya, and pears. This information provides insights into the prevalence of permanent crops, the types of crops grown, and the distribution of these crops across holdings in Nepal. The popularity of certain fruit trees like mango, banana, and oranges indicates the diversity of permanent crops cultivated in the country.



Major Fruits Area by Province



In the Census of Agriculture 2021/22 as in the past censuses, the area of fruits in compact plantation has been captured. Thus, the area of scattered fruits is not included in the total area as shown by the census. While comparing the area of major fruits in compact plantation as per the province, Gandaki is the top province for the orange with 32 percent of the total area of oranges in Nepal. Koshi is the

second top orange cultivating province in area with 25 percent of the total area of orange in the country. For lemon, Koshi is the top cultivating province in area with 26 percent of the total area of lemon in Nepal while Lumbini is the second top for the fruit with an area of 21 percent of the total. Madesh Province has a major lead in mango farming as 78 percent of the total area of mangoes in Nepal. Koshi has the top sharing for the banana farming with 22 percent of the total area of banana in Nepal. However, other four provinces: Lumbini, Gandaki, Madhesh and Bagmati has somehow similar trend for banana farming at household level. Karnali is the major apple producing province in Nepal in terms of its farming area. It shares the 71 percent of the total area of apple in the country.

Farming of major fruits has a significant impact for farmers' better livelihood and income generation. Climatic condition and geographical variation plays a vital role for the fruits farming. Policies and programs should be formulated and implemented considering the influencing factors for the development of fruits farming in the provinces of Nepal.

Table 6: Composition of major fruit area by Province, 2021/22

Fruits	Koshi	Madhes	Bagmati	Gandaki	Lumbini	Karnali	Sudurpaschim
Orange	1618	0	688	2089	865	892	393
Lemone	725	137	460	504	597	203	181
Mango	1169	15433	532	203	1833	313	300
Banana	1749	1183	1120	1303	1366	472	705
Apple	149	0	80	361	154	2198	139
Total	**5410**	**16753**	**2880**	**4460**	**4815**	**4078**	**1718**

Compact and Scatter Trees

The information available from the census gives details on the productivity of permanent trees in compact plantation, distinguishing between productive and non-productive trees, and highlights the changes observed over a decade.

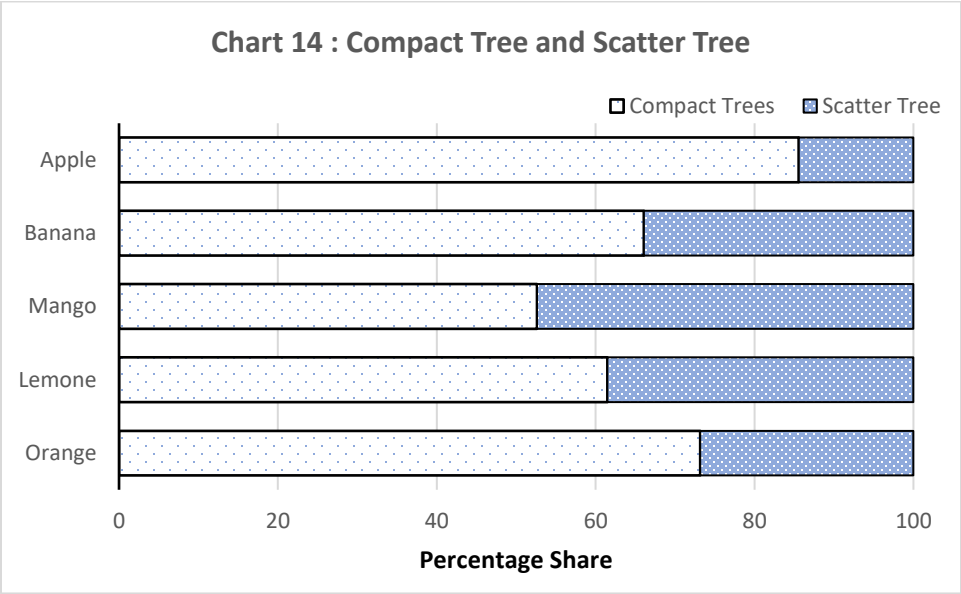
Of the total 145,363 hectares covered by permanent trees as compact plantation, 69,018 hectares were reported to be productive, bearing fruits. Non-productive trees occupied an area of 76,345 hectares under compact plantation.

There were a total of 28,543,145 trees of permanent crops in compact plantations, covering 69,018 hectares for productive age group under 675,961 holdings. Likewise, there were 21,117,384 trees with an area of 76,345 hectares for non-productive age group operated by 590,860 land holdings. The average density per hectare of compact plantation in 2021/22 was 341 trees.

The data can help to provide a comprehensive overview of the productivity of permanent trees in compact plantation, including the distribution of productive and non-productive trees.

Despite increase in the number of holdings growing permanent crops, the area of compact plantation decreased by 13.6 percent over ten years: from 168 thousand hectares in 2001/12 to 145 thousand hectares in 2021/22. The average area of compact plantation per holding has declined, from 0.0727 hectare in 2011/12 to 0.0581 hectare in 2021/22. The data suggests that while there has been an

increase in the number of holdings with permanent crops, the proportion relative to total area has decreased. However, there has been a notable rise in the area of major fruits like mango, banana, orange, apple and lemon.



4 Land under Temporary Meadow and Pastures

Land under temporary meadows refers to land, which has been cultivated with forage crops for mowing or pasture for less than five years. It appears that there was indeed an increase in the area of land under temporary meadow and pastures from 8410 hectares in 2011/12 to 12233 hectares in 2021/22. This represents a growth of about 45 percent, indicating a significant expansion of land utilized for cultivating forage crops for mowing or pasture of less than five years. Such an increase could be influenced by various factors, including changes in agricultural practices, land use policies, or shift in demand for forage crops.

5 Land under Temporary Fallows

Land under temporary fallow refers to land which the holder chose not to cultivate during the reference year, with the intention of cultivating it at a later date. Land which had been left idle for five years or more was included under another land use category (such as permanent meadows and pastures). It's interesting to note the significant increase in land under temporary fallow in Nepal from 31044 hectares in the Census of Agriculture 2011/12 to nearly double in the Census of Agriculture 2021/22.

This substantial rise of about 95% in temporary fallow land over the decade could be influenced by various factors. Changes in agricultural practices, economic consideration, weather condition, and government policies are some of the potential drivers. Farmers may choose to leave land fallow temporarily for reasons such as soil restoration, crop rotation, or economic decision-making based on market conditions.

6 Land under Farm Building and Farmyard

Land under farm buildings and farmyards refer to surfaces occupied by operating farm buildings (hangars, barns, cellars, and silos), building for animal production (stables, cow sheds, sheep pens, and poultry yards) and farmyards. The area around the holder's house (including the yard around it) is also classified here if it makes up part of the agricultural holding. Land under farm building and farmyard is considered separately in 2021/22 census. It was captured along with other land in 2011/12 census. It is interesting to note that in the Census of Agriculture 2011/12, the land under farm buildings and farmyards captured along with other land was about 107 thousand hectares. It is now considered separately and classified as out of agriculture land but within the land use for agriculture. As per the new definition, the total area of farm buildings and farmyards in Nepal is about 137 thousand hectares.

This distinction suggests a change in the way land under farm buildings and farmyards is accounted for, separating it from other agricultural land. It could reflect a more detailed and refined approach to categorizing and reporting land use in the context of agricultural holdings.

7 Forest and other wooded land

Forest and other wooded land refers to wood lots or timber tracts, natural or planted, constituting part of the holding which have or will have value as wood, timber, other forest products or for protection. It's noteworthy that there has been a significant increase of about 50 percent in the area of forest and wooded land from 54,890 hectares in the Census of Agriculture 2011/12 to 80,669.5 hectares in the succeeding census of 2021/22.

Several factors could contribute to this increment, including reforestation efforts, afforestation programs, changes in land use policies, and natural regeneration. The increase in forest and wooded land could have positive implications for biodiversity, environmental conservation, and the availability of forest products

8 Pond Area

Ponds refer to land under permanent standing water. The ponds may be natural or man-made and may be used for fishing, watering livestock, irrigation or any other purpose. It's quite significant to note that there has been a substantial increase in both the number of holdings and the area of ponds. The pond area increased from 3212.2 hectares to 12881.4 hectares in the last decade which is nearly three times increment of the former.

This increase in pond area could be indicative of various factors, such as increasing awareness of the benefits of ponds for various purposes like fishing, livestock watering, irrigation, or other agricultural activities. It might also be a result of government initiatives, technological advancements, or changing agricultural practices.

9 Other Area not elsewhere Classified

Other land not elsewhere classified refers to land which is not being cultivated and which would require some development before it could be brought into crop production and land occupied by buildings, roads, ornamental gardens and other open spaces on the holding. This classification typically includes land that is not currently under cultivation and may require development before

being used for crop production. Additionally, it encompasses land occupied by buildings, roads, ornamental gardens, and other open spaces on the agricultural holding.

The reporting of 3204.4 hectares of land under "Other area not elsewhere classified" category suggests that there is a portion of land that is not allocated for specific agricultural or cultivation purposes. This could include areas with potential for future development or land that serves non-agricultural activities on the holding.

PART III

Chart and Tables

Land Use Distribution

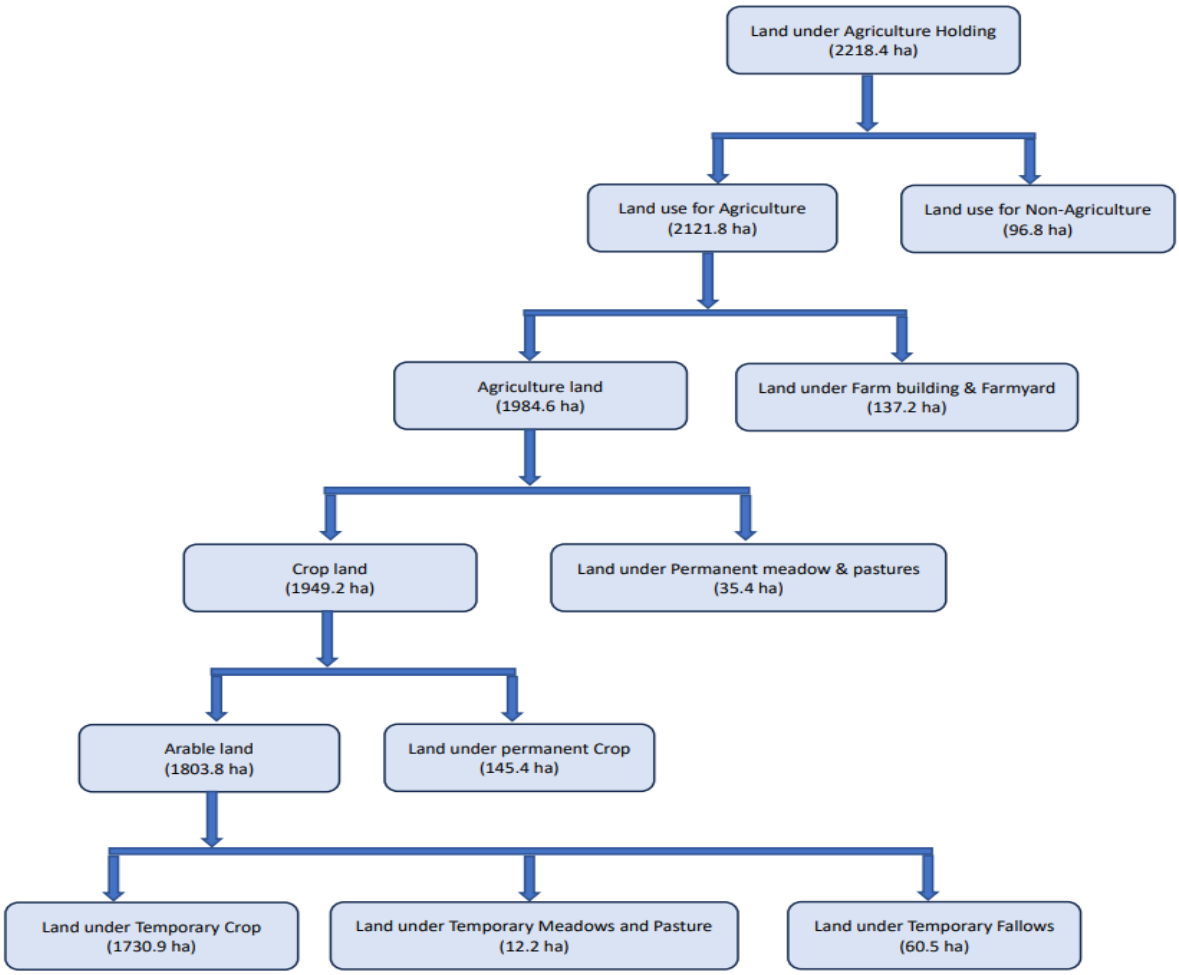


Table 1 : Number and area of holdings, Nepal (1961/62 - 2021/22)

Census Year	No. of Holdings ('000)	Area of Holdings ('000 ha.)
1961/62	1540	1685.4
1971/72	1721.2	1654
1981/82	2194	2463.7
1991/92	2736.1	2597.4
2001/02	3364.1	2653.9
2011/12	3831.1	2525.7
2021/22	4130.8	2218.4

Table 2: Area of Landholding by type of Land, Nepal 2021/22

Geographical Area	Area (ha.)			% of wet Land
	Dry Land	Wet Land	Total Land	
Koshi Province	204807.2	328130.1	532937.3	61.6
Madesh Province	25379.9	467117.2	492497.1	94.8
Bagmati Province	167335.3	114957	282292.3	40.7
Gandaki Province	103802.8	69970.2	173773	40.3
Lumbini Province	139488.1	287126.4	426614.5	67.3
Karnali Province	85002.9	32408	117410.9	27.6
Sudurpashchim Province	62613.1	130271.8	192884.9	67.5
Nepal	**788429.3**	**1429980.6**	**2218409.9**	**64.5**

Table 3 Area of Land holdings by Land Use , Nepal 2061-2021

Number in '000 ha.

Discription	Census Year						
	2061/62	2071/72	2081/82	2091/92	2001/02	2011/12	2021/22
Total Area of Holdings	1685.4	1654	2463.7	2597.4	2653.9	2525.6	2218.4
Agriculture Land	1626.4	1592.3	2359.2	2392.9	2497.7	2360.5	1984.6
Percentage of Agriculture Land	96.5	96.3	95.8	92.1	94.1	93.5	89.5
Arable Land	1591.9	1567	2287.5	2323.4	2357	2162.8	1803.8
Percentage of Arable Land	94.5	94.7	92.8	89.5	88.8	85.6	81.3
Non-agriculture Land	59	91.7	104.5	204.5	156.3	165.1	233.8

Table 4: Holding reporting cereal crops, Nepal (2001/02-2021/22)

Description	Census Year		
	2001/02	2011/12	2021/22
Arable Land ('000ha)	2357	2163	1804
Land under Temporary Crop('000ha)	2326.1	2123	1731
Cereal grain	3423.1	3122	2586
Legumes	379.4	298	200
Tubers	92.5	111	105
Oilseeds	214.2	186	180
Cash Crops	60.6	68	45
Spices	40.7	44	57
Vegetables	60	84	108

Table 5: Composition of Area under different temporary crops by Province, 2021/22

Geography	Rice Area	Wheat Area	Maize Area	Millet Area
Koshi Province	279,389	46,468	179,917	35,571
Madhesh Province	384,553	247,609	33,719	1,016
Bagmati Province	104,558	24,580	138,069	44,567
Gandaki Province	60,863	11,113	67,268	22,544
Lumbini Province	248,984	168,826	77,779	7,306
Karnali Province	29,241	51,026	40,083	5,627
Sudurpaschim Province	108,800	104,572	23,073	5,484
Total	**1,216,388**	**654,194**	**559,909**	**122,113**

Table 6: Number of trees by fruit types, Nepal 2021/22

Fruits	Compact Trees	Scatter Trees	Total Trees
Orange	4820310	1768328	6588638
Lemone	2309950	1448211	3758161
Mango	4137695	3728307	7866002
Banana	10398522	5344931	15743453
Apple	2729765	460721	3190486

Table 7: Number and area of holdings by crop type, Nepal 2021/22

Temporary Crop	Number of holdings	Area (ha.)
Early paddy	261,873	71,585.8
Main paddy	2,680,955	1,130,360.5
Upland paddy	86,572	14,441.4
Wheat	2,049,091	654,194.3
Spring/winter maize	578,347	133,695.6
Summer maize	2,046,127	414,181.9
Green maize	112,424	12,031.8
Millet	869,100	122,113.5
Barley/naked barley	296,820	23,270.8
Buckwheat	85,383	8,089.5
Other cereals	24,161	2,217.8
Soyabeans	339,994	12,368.2
Black grams	231,786	14,916.2
Red grams	70,170	5,017.3
Grass pea	96,521	15,641.2
Lentil	529,217	75,473.6
Gram	106,507	7,487.1
Pea	375,712	15,998.2
Green gram	56,812	10,296.9
Horse gram	67,351	5,634.8
Cow pea	518,219	12,611.9
Bean	622,146	18,004.0
Other leguminous crops	90,898	6,395.3
Winter potato	1,336,616	61,033.4
Summer potato	483,645	37,697.9
Sweet potato	34,144	819.1
Colocasia	260,716	3,946.9
Yam/cassava	59,982	633.0
Other tubers and bulbs	10,381	607.5

Temporary Crop	Number of holdings	Area (ha.)
Mustard	1,133,489	162,502.2
Ground nut	37,805	3,254.2
Linseed	55,560	8,302.8
Sesame	51,195	4,259.6
Niger seed	6,278	315.7
Other oil seeds	17,539	1,506.6
Sugarcane	96,204	40,149.5
Jute	13,130	2,819.3
Tobacco	7,242	1,065.0
Other cash crops	4,643	575.5
Chili	797,330	10,784.5
Onion	1,203,834	15,530.6
Garlic	1,255,887	13,415.0
Turmeric	285,364	4,404.6
Coriander seed	437,121	4,757.8
Other spices	25,893	595.5
Cauliflower	623,119	15,124.0
Cabbage	478,865	8,935.1
Tomato	424,093	10,928.6
Other vegetables	1,805,365	72,746.0
Grass crops	176,440	16,436.3
Other temporary crops	28,214	2,226.2

Table 8: Plantation features and ages of different permanent crops by crop types, Nepal 2021/22

Permanent crop type	Total holdings reporting	Compact plantation area (ha)	Compact plantation						Number of scattered trees	
			Productive age			Non-productive age			Productive age	Non-productive age
			No. of holdings	Area (ha)	Number of trees	No. of holdings	Area (ha)	Number of trees		
Orange	363,359	6,545.3	85874	4055.2	2,581,644	54507	2,490.1	2,238,666	879,882	888,446
Junar	34,806	251.5	5730	153.1	83,690	2644	98.4	288,813	53,718	44,494
Lemon	500,552	2,806.9	53129	1287.5	805,718	35998	1,519.4	1,504,232	665,740	782,471
Lime	115,538	152.3	9018	116.8	49,366	2867	35.5	62,766	144,534	71,713
Sweet Orange	55,904	186.0	8461	138.9	106,123	2733	47.2	93,414	103,142	78,315
Other Citrus	158,593	275.7	11690	203.9	81,311	4085	71.8	58,768	230,995	128,018
Mango	1,228,104	19,781.7	224095	16905.7	3,208,049	66527	2,875.9	929,646	2,422,708	1,305,599
Banana	710,693	7,898.2	150641	5908.5	7,326,919	66751	1,989.7	3,071,603	2,779,386	2,565,545
Guava	449,161	364.2	26466	282.1	139,001	6895	82.1	111,365	730,494	250,151
JackFruit	207,344	459.1	19827	391.7	110,558	4230	67.5	52,359	230,090	119,593
Pineapple	44,191	391.5	10198	311.2	877,070	2866	80.3	197,773	208,897	117,126
Lychee	274,830	1,177.9	32541	925.3	247,407	8570	252.6	151,758	288,076	180,883
Apple	67,190	3,080.2	27439	1783.8	1,551,737	20029	1,296.4	1,178,028	246,699	214,022
Pear	128,308	180.9	10240	146.8	60,318	2254	34.0	20,308	176,902	67,322
Peach	251,228	225.7	17617	175.4	74,059	4588	50.3	33,943	362,050	141,328
Papaya	191,669	157.1	10420	120.9	125,672	2687	36.2	50,086	279,081	117,661
Pomegranate	111,072	184.1	7841	99.1	48,577	3890	85.0	165,663	117,672	93,588
Coconut	44,804	51.5	2816	34.5	17,163	636	17.0	15,923	57,182	22,770
Walnut	57,284	611.9	10107	290.1	212,267	8159	321.8	304,176	90,200	117,612
Betel nut	117,568	2,088.0	18572	1245.6	1,456,043	10631	842.4	1,076,851	538,725	306,631
Kiwifruit	38,975	1,485.3	12108	959.6	344,591	7810	525.7	240,047	78,236	86,433
Avocado	40,112	470.9	4003	150.9	52,934	5279	319.9	138,063	38,838	78,457
Plum	100,223	125.8	8908	92.4	80,503	1822	33.3	17,772	147,391	42,761
Other fruits	129,941	704.3	11085	394.3	201,435	4838	310.1	247,061	236,136	156,849
Tea	21,341	5,665.7	16693	4982.8	5,578	683				

Permanent crop type	Total holdings reporting	Compact plantation area (ha)	Compact plantation						Number of scattered trees	
			Productive age			Non-productive age			Productive age	Non-productive age
			No. of holdings	Area (ha)	Number of trees	No. of holdings	Area (ha)	Number of trees		
Coffee	27,778	599.1	8442	417.3	564,819	3254	181.8	245,230	123,534	54,249
Cardamom	78,091	19,113.5	67940	16852.2	19,952	2261				
Fodder Tree			18261	220.1	174,249				11,840,157	
Multi-year grass crops			37507	3221.1						
Broom-Grass (Amriso)			112465	15438.9						
Thatch			215571	38913.3						
Bamboo			297470	3699.5						
Other permanent crop			173153	3051.4						

PART IV

Definitions of terms used

Agriculture Holding: An agricultural holding is an economic unit of agricultural production under single management comprising all livestock and poultry kept, and all land used wholly or partly for agricultural production purposes.

Small agricultural operations were excluded from the census. A holding was considered to be an agricultural unit satisfying any one of the following conditions:

- having area under crops greater than or equal to a quarter of a ropani (or four anna) in the hill or mountain district (0.01272 hectares), or greater than or equal to eight dhur (0.01355 hectares) in the Terai; or
- keeping one or more head of cattle or buffaloes; or
- keeping five or more head of sheep or goats; or
- keeping 20 or more poultry.

A household with livestock but no land was not considered a holding if the household did not use the livestock for agricultural purposes (e.g. a livestock trader).
The holding includes all land operated, whether or not it is owned by the holding. The holding's land may consist of one or more parcels located in one or more separate areas within a district. The holding is generally the same as a household (see definition of household).
Public grazing land is excluded. Land owned jointly by more than one person for grazing or for other purposes is included.
Holdings are defined in terms of their land and livestock holdings on the day of the census enumeration.
The Nepali word for the term holding used in the census was "**chalan (which means being used)**" or "**chalan gareko jagga**".
Holdings without land are holdings keeping livestock but having an area under crops of less than 0.01272 hectares in the hill or mountain districts, or 0.01355 hectares in the Terai (see definition of holding).
Holder: The holder is the person in the holding who exercises the management control over the operations of the holding. There is only one holder in each holding. The holder may or may not be the same person as the household head.
Household: A household is a group of persons who live in the same dwelling and make common arrangements for the provision of food and other essentials of daily living. A household may comprise one or more persons and may include unrelated persons. More than one household may live in a single house.

Head of the household: The head of the household is the person in the household acknowledged as head by the other members. The head has primary authority and responsibility for household affairs. The head of the household may or may not be the same person as the holder.

Parcel: Land operated by a holding consists of one or more parcels. A parcel is a piece of land entirely surrounded by land operated by someone else or not operated at all. A parcel may consist of one or more adjacent fields. The Agricultural Census parcel may be different from the parcel used in cadastral work.

Wet land refers to low land where water remains on the surface or on the upper soil layer, making the land suitable for main paddy cultivation.

Dry land refers to any land other than the wet land, i.e., land which is not suitable for main paddy.

Land use refers to the major classes of land use on the holding. For the purposes of the Agricultural Census, land operated by the holding is classified according to the land use categories given below:

A. Land used for agriculture
    a. Agriculture land
        I. Crop land
            i. Arable land
                - Land under temporary crops
                - Land under temporary meadows and pastures
                - Land under temporary fallow
            ii. Land under permanent crops
        II. Land under permanent meadows and pastures
    b. Land under farm buildings and farmyards
B. Forest and other wooded land
C. Pond
D. Other land not elsewhere classified

Arable land is further subdivided into land under temporary crops, land under temporary meadows and land under temporary fallow. Detailed descriptions of the various land use categories are given below.

Arable land refers to all land generally under cultivation and is divided into four categories:

- land under temporary crops,
- land under temporary meadows, and
- land left temporarily fallow.

A description of each of these categories is given below. Arable land excludes land under permanent crops.

Land under temporary crops refers to land used during the reference year for crops with an under-one-year growing cycle; i.e., crops, which must be newly sown or planted for further production after

the harvest. Land under temporary crops and the area of all temporary crops have different meaning. Land under temporary crops refers to the use of the land, not to the area of temporary crops; land used for double cropping will be counted only once. By contrast, the area of all temporary crops is the area of all crops sown – a double-cropped piece of land will be counted twice. This is greater than the land under temporary crops (as described under land use) because land may be used for cultivating crops in more than one season (double cropping).

Land under temporary meadows refers to land, which has been cultivated with forage crops for mowing or pasture for less than five years.

Land under temporary fallow refers to land which the holder chose not to cultivate during the reference year, with the intention of cultivating it at a later date. Land which had been left idle for five years or more was included under another land use category (such as permanent meadows and pastures).

Land under permanent crops refers to land cultivated with long-term crops which do not have to be replanted for several years after each harvest.

Permanent meadows and pastures refer to land which have been used for five years or more for growing forage crops.

Forest and other wooded land refers to wood lots or timber tracts, natural or planted, constituting part of the holding which have or will have value as wood, timber, other forest products or for protection.

Ponds refer to land under permanent standing water. The ponds may be natural or man-made and may be used for fishing, watering livestock, irrigation or any other purpose.

Other land not elsewhere classified refers to land which is not being cultivated and which would require some development before it could be brought into crop production and land occupied by buildings, roads, ornamental gardens and other open spaces on the holding.

Irrigation refers to purposively providing land with water, other than rain, for improving pastures or crop production. Natural flooding of land by rainfall or overflow of rivers is not considered as irrigation. Rainwater or uncontrolled flooding, which is collected and later used on the holding, is considered irrigation.

Land under irrigation is shown in the tables according to the source of irrigation water. The sources given are river/lake/pond (by gravity), river/lake/pond (by pumping), dam/reservoir, tube well/boring, other and mixed. "Others" includes taking the irrigation water from wells and springs. Mixed sources refer to a combination of the above sources (combination of two or more source).

Area under temporary crops refers to the area of temporary crops sown for harvest during the reference year 2021 (see under "Land under temporary crops" for definition of a temporary crop). Crops sown in 2020 for harvest during 2021 are included. Crops sown in 2021 for harvest in 2022 are excluded. Crops sown but not harvested (e.g. because of damage or weather conditions) are included.

Crops under pure stand: This refers to a single crop cultivated alone in a field (as opposed to a "mixed crop"). A pure stand crop may be either temporary or permanent. Crops cultivated on the same piece of land in two seasons (double cropping) are pure stand crops.

Mixed crops are two or more different temporary or permanent crops grown simultaneously in the same field or plot (as opposed to "pure stand" crops). Temporary and permanent crops cultivated together are called "associated crops".

Mixed crops include inter-planted crops and crops planted unsystematically as a mixture in a field. The area of mixed crops was estimated using whatever convenient method was appropriate. In some cases, the mixed cropland was divided according to estimates of the area under each crop. In other cases, this was not possible and an estimate based on seeding rates was made. In all cases, the total of the crop areas for the mixed cropland was the same as the area of the land itself.

Associated crops are temporary and permanent crops cultivated simultaneously in the same field. The area of each individual crop in associated crop land was determined using similar methods to that for mixed crops, and was done in such a way that the total of the individual associated crop areas was equal to the area of the associated crop land itself.

Compact plantation of permanent crops refers to plants, trees and shrubs planted in a regular and systematic manner. Plants, trees or shrubs planted in sufficient density to permit measurement of the area planted, are also considered compact plantations. Permanent crops not forming a compact plantation are considered "scattered trees".

Permanent crops of non-productive age are permanent crops which are not bearing fruit or which are below the fruit bearing age.

Permanent crops of productive age are permanent crops which are already bearing fruit or are otherwise productive.

Scattered trees refer to plants or trees planted in a scattered or isolated manner throughout the holding. For scattered trees, it was only possible to collect data on the number of trees (not area of trees as for compact plantations).

Forest trees on holding refer to any trees present on the holding on the day of enumeration apart from fruit trees and any other trees categorized as permanent crops.

Agroforestry is a sustainable land management system in which forest species of trees and other wooded plants are purposely grown on the same land as agricultural crops or livestock, either concurrently or in rotation.

Greenhouse farming refers to crop cultivation carried out under a controlled environment. It is a structure covered with a transparent material like polythene or polycarbonate plastic or fiberglass sheets for admitting natural light for plant growth. However, the common practice of vegetable farming in tunnels covered by plastic sheets is also included in this census.

Nursery is an enclosed place where flower or fruit plants are propagated and grown to a desired size for the purpose of own plantation or to sell to others.