NATIONAL SAMPLE CENSUS OF AGRICULTURE
NEPAL, 2011/12

RELIABILITY OF DATA

GOVERNMENT OF NEPAL
NATIONAL PLANNING COMMISSION SECRETARIAT
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KATHMANDU, NEPAL
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PREFACE

This report, "Reliability of the Data" provides a detailed technical documentation on the National Sample Census of Agriculture, 2011/12 and an evaluation of the reliability of the census data. The report has two main objectives: firstly, to provide users with an understanding of the reliability of the census data to assist in the interpretation and analysis of the census results and secondly, to assist in the design of future agricultural censuses and surveys.

The evaluation of the reliability of the previous National Census of Agriculture, 1991/92 was done by Mr. J.A.Colwell, Data Analysis Adviser of the FAO in 1994. This report is second in its nature and prepared by the Central Bureau of Statistics (CBS), Nepal with the existing capability within the bureau.

This report consists of three chapters. The first provides an outline of the census methodology used in the census. The detailed sampling specifications are given in Appendices 1 and 2. Appendix 1 contains the sampling specifications for each district while Appendix 2 provides a full sample design and estimation specifications.

The second chapter discusses the sampling errors on the census estimates. A brief overview of the sampling errors and their measurement and interpretation are provided, together with an overall assessment of the reliability of the census data from the point of view of sampling errors. Some observations on the efficiency of the sample design based on an evaluation of the sampling errors are also provided. Tables showing sampling errors for a selection of census estimates are provided in Appendix 3. Sampling errors are given for each development region, ecological belt and district, as well as for the national-level data. The tables in Appendix 4 provide a number of sample design parameters, which will be useful in the design of future agricultural surveys and censuses.

The third chapter provides an assessment of the overall quality of the census data. Some comparisons are made between the Agricultural Census data and the data from the 2011 Population Census, the current agricultural statistics from the Ministry of Agriculture Development, and the previous Agricultural Census. Tables summarizing these comparisons are shown in Appendices 5, 6 and 7 respectively.

Detailed results of the census are included in a series of 85 reports which have been published by the CBS. In addition to the national-level report, reports have also been produced for each ecological belt, development region and district. Similarly, a publication showing the highlights of the census with some commentary and graphical presentations has also been published.

I am thankful to Mr. Suman Aryal, Deputy Director General, Mr. Ambika Bashyal, and Mr. Badri Kumar Karki, Directors of the Agriculture and Livestock Census and Survey Section, and Mr. Birendra Kumar Kayastha, Director of the Agriculture and Forest Statistics Section for their prime role in the publication of this report. I would also like to thank statistical officers Mr. Kishor K.C., Mr. Ganesh Prasad Phuyal, and computer officer Mr. Raju Pokhrel for their indispensible input in the publication of this report. Likewise, I am very grateful to Mr. Tunga Shiromani Bastola, the former Director General of the CBS for his valuable support during the preparation of this report.

In spite of the best efforts some inadvertent errors may have crept into the report. Any pragmatic suggestions/corrections pointed out will be highly appreciated.

September, 2015   Bikash Bista
Kathmandu, Nepal   Director General
                                                                                              Central Bureau of Statistics

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CHAPTER 1

METHODOLOGICAL ASPECTS

Background

The 2012 National Sample Census of Agriculture (the 2012 census) was the sixth round of the decennial agricultural censuses of Nepal. The first census was carried out in 1961. Among the six agricultural censuses, information about reliability of estimates are available only from a technical report -*National Sample Census of Agriculture Nepal, 1991/92, Reliability of Data* published by the Central Bureau of Statistics (CBS), Nepal in 1994.

Realizing the importance of information on data quality, the CBS decided to analyze the 2012 agriculture census data and to bring out a publication on *Reliability of Data*(similar to that of the 1992 census published in 1994). This analysis, on the whole, is an updated version of the 1994 publication.

Scope and coverage

The 2012 census covered the whole of Nepal, including urban areas. Agricultural holdings operated by household members were included while agricultural activities undertaken by government institutions, corporations, etc. were excluded.

Statistical unit

The statistical unit used in the 2012 census was the agricultural holding. The definition of an agricultural holding remained the same as in the previous two censuses. An agricultural holding was defined as an economic unit of agricultural production under a single management comprising all livestock and poultry kept, and all land used wholly or partly for agricultural production purposes. Any one of the following conditions was essential for the identification of an agricultural holding:

- having area under crops greater than or equal to a quarter of a *ropani* (or four *anaa*)in the hill or mountain district (0.01272 hectares), or greater than or equal to eight *dhur* (0.01355 hectares) in the Tarai; 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.

The concept of agricultural holding was closely related to that of household. In rare cases, one household may comprise more than one holding or, alternatively, one holding may be operated jointly by more than one household.

The land operated by an agricultural holding consisted of one or more parcels, located in one or more separate areas, or one or more wards within a district.

Sampling design

The sampling design followed in the agricultural census was a stratified two stage sampling with district as strata, enumeration areas as first stage units and agricultural holdings as second stage units. In the first stage, selection was done using probability proportional to size (number of holdings) systematic sampling (PPS systematic). Selection of agricultural households at the second stage was done using equal probability systematic sampling.

Sampling frame

The sampling frame for the first stage selection was based on the information collected in the 2011 population census. The 2011 census had a set of questions on agriculture. This information was used in identifying the households with agricultural activities including livestock and poultry keeping. A list of all agricultural households with operated land area and number of livestock and poultry raised was then compiled. The lists were then aggregated to form a list of wards.

Enumeration area(EA) unit for the first stage selection was either a ward or a sub-ward or a combination of wards. A small ward was grouped with one or more neighboring ward(s) of the same village development committee (VDC), so that the combined total exceeded 25 agricultural households. In the case of very large wards, segmentation was done to form sizable first stage sampling units. The information on holding numbers was used as the measure of size for the PPS sample selection of EAs for inclusion in the census.

Sample size and allocation

Districts were strata for which estimates were to be prepared. Districts varied widely with respect to agricultural importance. The measure of importance of each district was based on the total area under nine crops (paddy, wheat, maize, millet, barley, sugarcane, oilseed, potato and vegetables) in the district. It was considered better to have larger samples in the more important districts.

In the 1992 agricultural census, districts were stratified into four groups according to their agricultural importance. The first group contained the least 10 districts and 50 EAs were selected from each district. Groups 2 and 3 contained 15 and 25 districts respectively. The fourth group contained 25 districts. The number of EAs allocated to the second, third and the fourth group were 60, 70 and 80 respectively. Manang was completely enumerated.

Table 1.1: Allocation of enumeration areas, Nepal, 1992 and 2012

Size of EAs	Number (1992)		Number (2012)	
	District	EAs	District	EAs
Less than 60 EAs	10	500	27	1,415
60 – 70 EAs	15	900	16	1,046
70 – 80 EAs	25	1,750	10	740
80 and more EAs	25	2,000	22	1,999
Total	75	5,150	75	5,200

The method of allocation followed in the 2012 census was slightly different from that of the previous two censuses. A method known as "compromise allocation" or "power allocation" was used in the census. The power chosen for the purpose was 0.4. The variable chosen for the power allocation was the total area under major crops, again. As in the previous census, Manang was completely enumerated. A comparison of the number of EAs selected in the two censuses is shown in Table 1.1.

The target number of holdings sampled from each selected EA was set at 25. Sampling details for each district are given in Appendix 1. Altogether, 5,200 EAs were selected. The final

sample of holdings for the country as a whole was 125,137 (or 3.27 percent of all holdings).

The number of sample holdings and the percentage of holdings sampled in each development region and ecological belt was as shown in Table 1.2.

Table 1.2: Sample sizes, Nepal, 1992 and 2012

Region/belt	Sample holdings in 1992		Sample holdings in 2012	
	Number	Percent	Number	Percent
Development region				
Eastern	27,033	4.25	28,561	3.19
Central	32,703	3.82	33,117	2.87
Western	26,284	4.32	27,059	3.39
Mid-western	22,914	6.17	23,049	4.01
Far-western	13,336	5.05	13,351	3.26
Ecological belt				
Mountain	20,938	8.03	20,686	6.32
Hill	62,917	4.63	60,137	3.48
Tarai	38,415	3.44	44,314	2.50
Nepal	122,270	4.47	125,137	3.27

Sample selection procedure

Within each district, the sample of EAs was selected systematically using the PPS sampling methodology. The number of agricultural holdings in the respective EA was taken as size measure. Implicit stratification was used before sample selection with a view to increase the efficiency of PPS systematic sampling. A computer program was prepared to do the sample selection - for each district, the required number of EAs to be selected and an appropriate random start were entered, and the sample of EAs was selected and printed. Details of the EA sample selection procedures are given in Appendix 2.

To select the sample of holdings in each selected EA, enumerators visited each selected EA to compile a complete list of all holdings in the

EA. Holdings were then divided into the

following strata:

- holdings operating less than 1*bigha/*10*ropani,*
- holdings operating 1*bigha*/10 *ropani*sor more but less than 3*bigha*s/20 *ropani*s,
- holdings operating 3*bigha*s/20 *ropani*s or more,
- holdings not operating land but keeping livestock and poultry.

Holdings in the EA were numbered sequentially throughout the first stratum and then continuing on throughout the other three strata. The number of holdings to be sampled in the EA was determined in accordance with the procedures laid down in Appendix 2.The sample of holdings was then selected using systematic sampling. A

sampling interval was calculated by dividing the number of holdings listed by the sample size to be taken. A random start was then taken (a random number between 1 and the sampling interval). The sample of holdings was then selected by applying the random start and sampling interval throughout the list of holdings beginning with the first stratum and continuing throughout the remaining three strata.

Census content

The 2012 census followed the FAO guidelines as set out in the document FAO Statistical Development Series 11 –A system of agricultural censuses and surveys, Volume 1: World Programme for the Census of Agriculture 2010 (FAO 2005). The guidelines provide detailed recommendations to countries on topics to be covered, statistical concepts and definitions, classifications and output.

The 2010 world programme recommended data items for inclusion in the census of agriculture "under two headings according to their suitability for the core and supplementary modules". The 2012 census followed the recommendations as far as possible and suitable. The questionnaire was divided into following 11 headings.

1 Holder identification. Holder household head or not, caste/ethnicity, address, respondent's identification (if not holder), relation to holder.

2 General characteristics. Legal status of holder, main produce of holding, purpose of production, other economic production activities.

3 Demographic and other characteristics. Household size; name, sex, age, relation with household-head, literacy status, and main occupation of holder and other household members; whether employed permanent workers, number of permanent workers by sex;

whether employed occasional workers, number of occasional workers by sex and number of man-days worked; whether work performed on labour exchange basis, number of workers on labour exchange basis by sex and number of man-days works.

4 Land and water. Whether any land rented out to others, area of rented out land; total number of parcels on holding; whether any soil degradation, type of soil degradation; for each parcel: area; wet and dry land; area irrigated; source of irrigation; mode of payment for irrigation water; land tenure (owned, rented, etc.); land use (arable land, permanent crops, etc.).

5 Crops. Temporary crops: type of crop and area harvested on each parcel, production of selected crops on each parcel; permanent crops: type of crop for each parcel; compact area and number of productive and non-productive trees; number of scattered trees, production of selected crops on each parcel; crop stand for each parcel (i.e. whether mixed crop); use of agricultural inputs for major crops: type of seed (local, high yield and hybrid), pesticides, irrigation and fertilizers (organic/inorganic, area and quantity of inorganic fertilizer used).

6 Livestock. Whether any livestock/poultry birds on holding, animal numbers by type according to age and sex and breed; poultry numbers (chickens classified by sex and breed).

7 Machinery and equipment. Use of items of machinery and equipment; number of items on the holding by source (owned by holder, joint, rented, etc.). Buildings and other structures.

8 None-residential buildings. Whether non-residential buildings used for agricultural purposes; tenure and type of those buildings.

9 Forestry and other ancillary activities. Existence of forest trees, area and number of

trees, purpose of growing trees; existence of other ancillary activities (mushroom farming, sericulture, bee keeping, and fisheries); fisheries in the holding (type and area of fishing installation).

10 Agricultural credit. Whether any outstanding loan; source of loan; whether any loan/additional loan required; main purpose of loan.

11 Miscellaneous. Main source of income of the household; sufficiency agricultural produce from the holding, months of food shortage, steps taken to alleviate food shortage; distance to agricultural market from home.

Definitions of data items used in the collection of census data and presentation of results are given in the Technical Notes in the census reports. The primary reference period for the data collected in the census was the calendar year 2011. Land area and livestock were collected in respect of the day of enumeration.

Census enumeration

A pilot test of census questionnaires and procedures was undertaken in 2010. Sampling design and census questionnaires and other forms were finalized following evaluation of that test. Instruction manuals were prepared for all field staff involved in the census enumeration.

Census field operations in each district were under the control of a District Census Officer, appointed for the duration of the census enumeration. On the average, around 6 supervisors were appointed in a district to supervise the census enumerators; each supervisor controlling the work of three to four enumerators. A total of 1,567 enumerators were recruited to undertake the data collection for the census.

Training of field staff was conducted in different stages. Training for trainers was conducted in the first phase; this was followed by training for district census officers and training for central supervisors. Training for field supervisors and enumerators was undertaken in each district by CBS officers as well as district census officers. The training was conducted in two phases – during January 2012 for the first phase 59 districts and during April 2012 for the second phase 16 districts. A refresher training was conducted in between the first phase and second phase of census enumeration.

Census enumeration was carried out over the period January to June 2012 in two phases. In the first phase, enumerators visited each selected enumeration area (EA) to list all agricultural holdings in the EA. Information on area of holding, number of livestock and number of poultry for each holding were recorded. The listing form was used to do the sample selection of-holdings. Sample selection was done by the supervisors. Most of the sample selection was done in- the District Census Office. In some remote areas, sample selection was done in the field.

After the sample selection, enumerator then returned to the EA for the data collection. Enumerators interviewed each selected holding to collect the census data. A questionnaire was completed for each selected holding. Questionnaires were returned by enumerators to District Census Offices where they were checked prior to being returned to CBS in Kathmandu for processing.

Processing of census data
The processing of the census was undertaken on micro-computers and involved computer systems tor data entry, editing and tabulation. The computer systems were developed using SPSS.

On receipt of the questionnaires from the field, CBS staff first inspected them to ensure that no questionnaires were missing, that all required questions were answered and that responses were clearly marked. No office coding was necessary as all coding was done during enumeration. However, questionnaires were checked thoroughly for any missing.

Data entry was done within the CBS using the Bureau's staff a few other temporarily hired persons. The data entry and other programmes were developed by the CBS. Data entry was completed in two months by 35 persons. Payment for the job was done on a key-stroke basis.

Random checks were made to ensure the quality of data entry work. For this, around 5 percent of the questionnaires were randomly selected, data re-entry and then matching was done.

A computer system was developed to perform a series of consistency, plausibility, range and other checks on the data. The edit program provided for interactive editing; the program applied each edit check to a questionnaire and immediately identified on the screen data failing the edit checks. Edit failures were examined and corrections were immediately entered into the computer as required.

Once data for a district had been edited and amended, the data were aggregated and weighted to produce district level tables. District tables were aggregated to produce tables for each development region and ecological bell, and finally at the national level. A set of tables was also produced showing district comparisons.

The tables were closely scrutinized and checked for their consistency with other sources. Some consistency checks were also included as part of the tabulation programs. Any problems identified were traced back to the source questionnaires, amendments were made as necessary and final tables were produced.

Census reports

The main census results are being published by the CBS in a series of 85 reports:

- one national level report;
- reports for each of the five development regions;
- reports for each of the three ecological belts;
- reports for each of the 75 districts;
- and a report presenting a summary of district level data.

Each of the reports contain the same set of 32 tables. The tables provide data on each of the topics covered in the census, each table being classified by size of holding. Tables in the district summary report are presented in the same format with data classified by district rather than size of holding.

A publication showing highlights of the census has also been issued in Nepali. The publication shows some summary tables together with some commentary and graphical presentations.

Availability of census data

In addition to the census reports, for the first time census micro-data are also have been made available for sale.[1]

Diskettes have been prepared containing summary data and a computer program which enables users to produce some limited tables of their own specification. Data files have also been restructured to enable additional tables to be produced or statistical analysis techniques to be applied using SPSS or other statistical analysis packages.

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[1]The pricing is as follows:
Nepalese individuals: NRs. 3,000;
GoN, and NGOs: NRs 5,000;
Other users: US$ 300.

CHAPTER 2

SAMPLING ERRORS[1]

Sampling error concepts

The 2012 agricultural census was a large scale sample survey. Except for Manang district, enumeration was carried out in each district on a sample basis. Sample enumeration entails sampling error. The sampling error on a sample estimate measures the expected difference between the sample estimate obtained and the estimate that would have been obtained if a full census had been taken. Two commonly used measures of sampling error are the standard error and the relative standard error. The methods used to calculate these sampling error measures are given in Appendix 2.

The interpretation of standard errors is illustrated in the following example. The total area of land holdings in the eastern development region (EDR) was estimated as 755,178 hectares. The standard error on this estimate has been estimated as 10,460 hectares. The following statements can be made: (Table 3.1)

- We can be about 67 percent sure that the actual (unknown) total area of holdings was in the range755,178 ± 10,460 hectares; i.e. between 744,718 and 765,638 hectares.
- We can be about 95 percent sure that the actual (unknown) total area of holdings was in the range 755,178 ± 2 x 10,460 hectares; i.e. between 734,258 and 776,098 hectares.

The relative standard error expresses the standard error as a percentage of the estimate; i.e. the relative standard error on the estimate of total area of land holdings in EDR is 1.4 percent. The relative standard error provides a convenient way of comparing sampling errors

for different estimates. The smaller the relative standard error, the more reliable is the estimate. The size of the sampling error on an estimate depends on three main factors: the sample size, the degree of variability between holdings for the item being measured, and the efficiency of the sample design.

Sample size. All other things being equal, the larger the sample size, the lower will be the sampling error and the more reliable will be the estimate. For this reason, national level estimates will be more reliable than district level estimates. For example, the relative standard error on the estimate of total area of land holdings in Nepal as a whole is 0.6 percent, much smaller than the corresponding figure of 1.4 percent for the EDR.

Variability in the data item. The greater the variability in the item being measured, the less reliable will be the sample estimate. For example, the relative standard error on the estimate of the area of paddy grown in the Tarai is 0.9 percent, compared with 1.8 percent for the area of maize. Paddy estimates are more reliable because there is greater variability in maize area between holdings (e.g. many holdings have no maize).

Efficiency of sample design is discussed in detail later.

There were many different types of census estimates produced; including estimates of holding numbers (e.g. number of holdings growing paddy), area estimates (e.g. area of paddy grown), averages (e.g. average household size), and estimates of person numbers (e.g. number of female household members). There is no general rule as to what is an acceptable level

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[1]This chapter is an updated version of the previous report on the 1992 census of agriculture.

of standard error; it depends on the type of estimate, the use being made of the estimate, and the reliability required.

For many purposes, estimates with relative standard errors of less than about 5 percent can be considered highly reliable. Relative standard errors greater than 20 percent are often considered insufficiently reliable for many uses.

In analyzing distribution tables (e.g. distribution of holdings according to size of holding), standard errors on each individual estimate (e.g. the number of holdings in each size category) may be quite high but, since the user is mainly interested in the overall shape of the distribution only, the data may still be quite adequate for the purposes required.

Special note should be made of the standard errors when using the census data to make comparisons (e.g. between areas or in comparison with previous censuses). In these cases, the estimate of difference is often subject to quite high standard errors.

Presentation of sampling errors

It would not be possible to calculate sampling errors for each census estimate given in all census reports. Instead, sampling errors are shown in this publication for a selection of census estimates. These can be used as a guide to levels of sampling error for other estimates. The standard errors were calculated using computer programs written in SPSS version 14.

Standard errors have been presented for the following ten items;

- total area of holdings;
- area under temporary crops;
- area under paddy,
- area under maize;
- area under wheat;
- area under potatoes;
- area of irrigated land;
- total paddy production;
- total maize production;
- total wheat production;
- total potatoes production; and
- farm population.

Standard errors and relative standard errors for these items for estimates for Nepal as a whole, as well as for each development region, ecological belt and district are shown in Appendix 3. All area figures refer to land holdings only; other data refer to all holdings.

For estimates of numbers of holdings in a particular category (e.g. number of holdings with under 0.1 hectare of land), the relative standard error depends primarily on the number of sample holdings on which the estimate is based. The larger the sample size, the lower the relative standard error.

The sample size on which a district level estimate is based may be calculated from the sampling specifications given in Appendix 1. For example, an estimated 1,273 holdings in Dhankuta district had under 0.1 hectare of land. From Appendix 1, the sampling fraction is 5.1 percent; therefore the estimate is based on a sample of about 0.051 times 1,273, or 65.

For higher level estimates, the sampling fractions are given on Table 1.2 of this report.

Assessment of sampling errors

In general, the levels of sampling error achieved in the census were in accordance with expectations and indicate that, on sampling error grounds, the census should provide satisfactory data for users. A detailed evaluation of sample design issues as they affect the magnitude of sampling errors on the census estimates is given later.

A general assessment of the sampling errors at the various geographic levels is given below.

(a) National level

For Nepal as a whole, the sample size of 125,137 holdings is sufficient to give reliable estimates at a fine level of detail. Relative standard errors are less than 1 percent for most major aggregates shown in the standard error tables. Data given in the national publication should generally be highly accurate and suitable for most detailed analysis. Size of holding classifications shown in the tables will usually be very reliable, although there are some rarely reported categories where small estimates may be subject to high sampling errors.

There is scope for producing more detailed cross-tabulations and other data with a high degree of reliability.

(b) Development regions

For development regions, the sample size depended on the districts making up each region. The sample size was much smaller in the far-western development region (FDR) than in other regions and relative standard errors are correspondingly higher - 2 to 4 percent for major aggregates compared with 1 to 3 percent in other regions. The western areas of the country are also less developed and therefore likely to exhibit greater inherent variability in the characteristics being measured in the census than in other areas; this will also tend to increase sampling errors in the far-western region.

Data provided in the development region publications should generally be sufficiently reliable for most detailed analysis work, apart from very small estimates for rarely occurring cases. More detailed cross-tabulations should also be able to be produced with a satisfactory degree of reliability.

(c) Ecological belts

For ecological belts, the sample size was greater in the hill belt than in the Tarai but, because of the greater inherent variability in hill areas,

sampling errors were often comparable in the two areas (relative standard errors less than 2 percent being common). In the Mountain belt, the sample size was much smaller and the relative standard errors are correspondingly higher (commonly around 3 percent).

Data given in the ecological belt publications will generally be sufficiently accurate for most detailed analysis, subject to the same concerns expressed previously about small estimates. More detailed cross-tabulations should also be able to be produced with a satisfactory degree of reliability.

(d) Districts

Sample sizes in districts varied from around 1,100 (Bhaktapur) to 2,500 (Morang). The sample was designed in this way to provide more reliable estimates for the more important districts and, generally, this was achieved. However, because of different agricultural characteristics within districts, variability patterns varied considerably and, as a consequence, standard errors showed much variation. Relative standard errors are commonly in the range 4 to 6 percent on major aggregates in the more important districts, but as high as 8 percent in other areas.

District level estimates for the major aggregates (such as total area of holdings, average holding size, holdings with paddy, etc.) can be considered of sufficient reliability to be useful for most purposes. However, the district level publications provide more detailed breakdowns and often the estimates given are subject to high sampling errors. Estimates for many categories are often very small (or even zero) and considerable care needs to be exercised in the interpretation and use of these data. The sample sizes in each district provide very limited scope for disaggregation of the data.

Sample design concepts

An evaluation of sampling errors is useful not only to assist in the use and interpretation of the census data but also to assess the efficiency of the sample design as a guide to the design of future agricultural censuses and surveys.

Because the sample was based on multi-stage sampling, the sample of holdings was clustered in selected EAs. This was necessary in order to reduce the cost of listing, but will mean that census estimates will be less reliable than would have been the case had the sample been spread across all EAs. The use of various sampling techniques such as PPS sampling, stratification and systematic sampling should at least partly overcome this loss of reliability.

To assist in assessing the efficiency of the census sample design and the effects on the reliability of estimates, a number of sample design parameters have been estimated. Three parameters - coefficient of variation, design effect and measure of homogeneity - are shown in Appendix 4 for a selection of variables for each district. The interpretation of these measures is given below.

The coefficient of variation measures the variability of the characteristic (i.e. the population standard deviation) relative to the average value of the characteristic. It enables comparisons to be made between the variability of different characteristics. For example, the coefficients of variation of the characteristics "area under paddy" and "area under maize" in Kanchanpur district are 1.03 and 1.39 respectively. This indicates that there is more variability between holdings in respect of maize area than paddy area. All other things being equal, the larger the coefficient of variation, the higher the relative standard error.

The design effect provides a measure of the reliability of the census estimate for the characteristic in question in comparison with the reliability which would have been achieved if the sample had been selected using simple random sampling (i.e. spread across all EAs). The design effect provides a measure of the extent to which the sampling error is affected by the "clustering" of the sample in selected EAs. The larger the design effect, the less efficient is the design (the more reliability is lost because of the clustering effect). A design effect of 1.0 would indicate that the reliability is the same as if simple random sampling had been used.

Measure of homogeneity. As indicated earlier, the reliability of an estimate is influenced by the population variability of the characteristic being measured, in a two stage design such as used in the census, the population variability has two components - the variability between holdings within EAs and the variability between EAs.

The measure of homogeneity measures the relationship between the two components of variability. A low measure of homogeneity (typically less than 0.1) indicates that the variability between EAs is low in comparison with the variability within EAs; this may occur for characteristics such as cattle numbers which will tend to be fairly consistent across many parts of the country. A high measure of homogeneity on the other hand indicates that the variability between EAs is high in comparison with the variability within EAs; this occurs for characteristics such as crop areas which may tend to be concentrated in certain geographic areas.

The measure of homogeneity is important to assess the most suitable configuration of sample; in particular, how many EAs should be sampled and how many holdings should be taken in each selected EA. For example, if the between EA variability is high relative to the within EA variability (i.e. a high measure of homogeneity), then the sample should be spread across more EAs.

The measure of homogeneity is closely related to the design effect; a high design effect reflects the fact that a different configuration of sample between EAs and holdings would improve the reliability of the data.

Evaluation of sample design

Sample design information made available from the 1992 census was extensively used in reviewing and designing the sample for the 2012 census. For the design of future censuses, information from the 2012 census on sampling errors and the various sample design parameters will be available and this will assist in developing a more efficient sample design and hence provide more reliable census data.

The sampling methodology used for the 2012 census, based on two stage sampling, was sound and should form the basis of the design for future agricultural censuses/surveys. A number of general observations on the sample design are given in the following.

Probability proportional to size sampling of EAs. The use of probability proportional to size sampling (PPS) for the selection of EAs provided significant improvements to the sampling efficiency of the design over the alternative equal probability selection method. The selection was based on information on numbers of holdings in each ward obtained from the 2011 population census. This information also provided the basis for the formation of suitable sized enumeration areas, which assisted greatly in the organization of field operations.

Sample allocation to districts. The allocation of sample size to districts was in the form of compromise allocation (also known as power allocation), striking a balance between district and higher level estimates. It was a compromise between equal and proportional allocation. Samples were allocated to different districts in proportion to x^{λ}, where x is the size measure (area under major crops). The value of the parameter λ was taken to be equal to 0.4. The power allocation was adopted with a condition that at least 50 first stage units (EAs) were selected from each district.

Form each selected EA, a sample of about 25 holdings was selected for census enumeration. The intention was to achieve two objectives -

first, to provide sufficient sample in each district to enable district level estimates to be produced and second, to provide more reliable estimates in more important districts.

The approach used is appropriate in the situation where the main aim of the census is to produce district estimates. Sampling errors depend mainly on the sample size, not the sampling fraction, and therefore the aim was to take comparable sample sizes in each district, regardless of sampling fractions. In larger districts, only 2 to 3 percent of holdings were sampled, while for smaller districts, over 15 percent were sampled. In Manang, all 993 holdings were enumerated.

Stratification of holdings in selected EAs. The stratification of holdings within selected EAs for sample selection purposes was simple from an operational point of view and contributed to ensuring a good spread of holding sizes. This had some beneficial effect on sampling errors.

Variability of characteristics. Measures of the coefficient of variation, as given in Appendix 4, are sometimes large, indicating that the variability of some characteristics was quite high. Sampling errors are sometimes correspondingly higher than expected.

In some cases, coefficient of variation measures (and standard errors) were strongly influenced by very large or unusual units.

Significant improvements in the reliability of census estimates can be achieved in future by "completely enumerating" particular types of unusual holdings; that is, allocating them to a separate stratum and sampling them with certainty. Holdings with more than 10 hectares could be treated in this way; so also could other special types of holdings. Holdings to be completely enumerated would need to be identified in advance of the census enumeration. CBS field staff could provide such information.

Number of holdings per selected EA. The decision to sample about 25 holdings in each

selected EA was based primarily on operational factors; concentrating the sample in relatively few areas facilitated the organization of the data collection and minimized the travelling times involved in moving between EAs for census data collection.

However, from a sampling point of view, this represents a fairly "clustered" sample design in that the sample holdings were not widely spread throughout each district. The effect of this clustering is seen in the measures of design effect given in Appendix 4. The design effect measures are often higher than 3.0, suggesting that significant gains in the reliability of estimates could be achieved by spreading the sample across more EAs and sampling fewer holdings in each selected EA.

This would need to be balanced against the travelling time and other operational factors. Detailed design work should be undertaken to determine the best sample allocation. It may be appropriate to sample differently in different areas according to the distance from the district headquarters and the expected time involved in travelling between EAs.

CHAPTER 3

ASSESSMENT OF QUALITY OF DATA

Comparison with the 2011population census

Listing form of the 2011 population census (the 2011 census) included questions concerning agricultural activities of households - "total area of holding operated" and "total number of livestock". This information was used to identify whether each household constituted an agricultural holding for the purposes of the 2012 census[1]. This was used as an aid in the selection of the sample for the 2012 census.

Tables showing a number of comparisons between data from the two censuses are given in Appendix 5. In interpreting the figures in the tables, it needs to be borne in mind that the censuses were undertaken at different times; the 2011 census was undertaken in June 2011, while the 2012 census was undertaken between January and June 2012.

The main points highlighted by the tables are presented in the following.

Farm population

The number of agricultural holdings (or farm households) in the 2012 census was taken to be the same as in the 2011 census. Therefore, any differences between population data from the two sources reflect differences in the enumeration of household members.

Overall, the farm population as reported in the 2012 census was around 2 percent higher than that given by the 2011census. In the ecological belts, the differences varied between 1 and 3 percent. Amongst development regions, the differences were highest in the eastern region

[1]National Sample Census of Agriculture, Nepal, 2011/12.

(3percent) and lowest in the central region (less than one percent). (Table A5.1)

The 2012 census showed higher farm population in about two-thirds of the districts in the country. Differences were quite high in a few cases. Most of the districts for which the population was lower than in the 2011census were from the mountain region. (Table A5.3)

The average household size figures mirror the population comparisons referred to above. The average farm household size was slightly greater in the 2012census than in the 2011 census in each ecological belt and development region, as well as at the national level. (Table A5.2)

Data on age and sex of the farm population from the 2012census have been compared with the corresponding figures from the 2011 census for the population as a whole (which includes both farm and non-farm households). The comparison may therefore be influenced by differences in the age-sex structure of the population between farm and non-farm households.

Overall, there seems to be no substantial difference in the age composition of the two censuses. The age group 15 to 54 years may be slightly over-represented (proportionately) in the 2012 census in comparison with the 2011 census. Persons in young age groups (under 15 years) may have been correspondingly under-represented. (Table A5.4)

The sex ratios (number of males per 100 females) calculated from the two sources indicate that, at the national level, the 2012 census has enumerated more males in relation to females (sex ratio 100.8) than did the 2011 census (sex ratio 94.2). Overall, the 2012 census enumerated 10.32 million males compared with

10.23 million females. The differences in sex ratios are quite consistent across age-groups. The sex ratios in the 2012 census are especially high for persons below 15years of age and persons 45 years of age and above. (Table A5.5)

At the district level, the 2012 census enumerated more males than females in 36 districts, compared with only 14 for the 2011census. The differences between the censuses were quite significant in some districts. (Table A5.6)

The comparisons point to some inconsistencies in enumeration practices between the two censuses. The problem may be highlighted by a detailed analysis of data from Gulmi district. There were an estimated 57,705 agricultural holdings in the district. The Agricultural Census estimated 260,630 population (average household size 4.5), compared with only 280,160 (average household size 4.3) in the Population Census.

An examination of the age and sex structure shows that the discrepancy is entirely in the male population, especially in the working age group. This seems to have arisen because many members of this group move elsewhere to work and they appear to have been enumerated in the 2012 census but not in the 2011 census. The same pattern also seems to exist in a number of other districts and this partly explains the differences in the age and sex composition.

There is some evidence of under-enumeration of females in the 2012 census. This seems to have occurred across all age groups.

Comparison with current agricultural statistics

A comparison of statistics from the 2012 agricultural census with current estimates of crop areas and livestock numbers for 2011/12 provided by the Ministry of Agricultural Development (MoAD) is presented in Appendix6.

The data from the MoAD relate to the year July 2011 to June 2012. Crop data from the 2012 census relate to the calendar year 2011, while livestock information was collected in respect of the day of census enumeration (sometime between January and June 2012).

(a) Crop area

The area under paddy recorded in the census was lower than that given in the figures reported by the MoAD. At the national level, the area under paddy was estimated from the census to be 75,500 hectares lower (5 percent) than the current estimates.

The census paddy figure was higher in the Tarai belt but lower in the mountain as well as the hill belts. For development regions, the census figures were lower in the three western-most regions and higher in the eastern and central regions. There were significant differences for some districts.(Tables A6.1, A6.3)

At the national level, the census maize figure was 197,700 hectares lower (29 percent) than the other source (MoAD). This pattern was consistent across ecological belts as well as the development regions.

For wheat, the area recorded at the national level in the census was slightly lower than the other source. Amongst ecological belts, the discrepancy is most significant in the Hills; the census figure is significantly lower. (Table A6.1)

The report on "Reliability of Data" of the 1992 agricultural census[2] has highlighted the difficulty in definitively judging the reliability of the two data sources. The reasoning is valid to the present case as well.

[2]CBS, 1994. *National Sample Census of Agriculture Nepal, 1991/92, Reliability of Data, Technical Report*, p. 14.

The 2012 census was undertaken using "proven and objective statistical methods". However, it is recognized (as in the 1992 census) that area reporting in the census may not always have been fully accurate. The area estimate was based on information reported by the respondent (sometimes using seed units converted into area measures). Hence, enumeration problems undoubtedly also had an effect in some cases.

It is commonly recognized that the current crop statistics suffers from the lack of an effective data collection methodology – the figures are based on subjective estimates made by field staff' of the District Agricultural Development Offices.

The total area of agricultural land estimated from the 2012 census is 2.4 million hectares while the estimate obtained from other sources is more than 2.6 million hectares. While comparing these figures, however, it is important taking into consideration the coverage of the census and definitional differences.

The following passage from "Reliability of Data" published by the CBS in 1994 is relevant to the present context as well. *In general, the census figures can be taken to be more reliable than the current crop estimates, although figures at the district level should be closely analyzed. In interpreting district level figures, it is important to recognize that the census figures relate to holders living in the district, not to the land in the district.*[3]

(b) Number of livestock

The MoAD source census estimated some 8.1 million more cattle than from the 2012 census. The differences were consistent across ecological belts and development regions.

The number of buffaloes recorded in the census was significantly lower than the figures reported

³Ibid, p. 15.

by the Ministry of Agricultural Development. The census figures were consistently lower for eco-belt as well as development regions. (Table A6.2)

Once again, it would be pertinent to quote the following passage from "Reliability of Data" published by the CBS in 1994. *The reliability of the livestock statistics from current sources are affected by the lack of national coverage - data are collected from only some districts each year. There are no major reporting problems likely to have affected the quality of reported livestock data and therefore the census data should be considered more reliable than the current estimates.*

Comparison with previous census

The following is a comparison of data from the 2002 and 2012censuses. Comparison tables are shown in Appendix 7.

Comparisons between the censuses are affected by changes in methodology and improvements in data quality. Data from the 2012census should be considered to be of higher quality than earlier censuses because of improvement in sample selection procedures (such as power allocation adopted in the 2012 census). The differences are alsolikely to be affected by the genuine changes which have taken place over the ten years.

(a) Number and area of holdings

In the ten year period between 2002 and 2012, the number of holdings in the country increased by 14 percent, while the area of holdings decreased by 5 percent. The average size of holding declined from 0.8 hectares in 2002 to 0.7 hectares in 2012. For holding numbers, amongst ecological belts the increase was larger in the Tarai belt (20 percent). Among the development regions, the Far Western region showed the highest growth (23 percent) followed by the mid-western region (22 percent).

The decrease in area of holding in the Hills and the Tarai belts were similar (5 percent); in the Mountains, the decrease in area of holdings between 2002 and 2012 was comparatively lower (2 percent). Decline in area of holdings was also recorded in the development regions varied between 3 to 6 percent. (Table A7.1)

The overall decline in area of holdings is not consistent with the increased number of holdings.There might be more than one reasons for the decrease in land holdings – under enumeration in the 2012 census, over enumeration in the 2002 census, change in land use pattern over the years, some reporting problems, etc. A detailed study might be needed to assess the unlikely change in the area of holdings.

(b) Number of parcels

Over the ten years 2001/02 to 2011/12, an increase of about 10 percent in the number of parcels was recorded. However, the average number of parcels per holding declined from 3.3 to 3.2. The number of parcels increased substantially in the Far Western Development Region (37 percent) followed by the Mid-western region (29 percent). (Table A7.2)

(c) Paddy growers and area under paddy

During the decade 2001/02 to 2012, the area under paddy decreased by 6 percent, while the number of growers increased by 27 percent. The decrease was recorded in all eco-belts as well as development regions. (Table A7.3)

The decrease in area under paddy is not consistent with expectations, again. The apparent increase in numbers of paddy growers while a decline in area under paddy may have been the result of a combination of effects, including the fragmentation of land and reduction in farm sizes.

(d) Farm population

During the decade 2002 to 2012, the farm population recorded an overall increase of 4 percent. The increase, however, was not consistent across the eco-belts as well as the development regions. Among the eco-belts, the Hills recorded a decline of 3 percent. Among the development region, the story was even more surprising. For example, the Eastern Development Region recorded an increase of 81 percent while there was a decline of 41 percent in Far Western Region.

Post-enumeration survey (PES)

As in the previous censuses (the 1992 and the 2002 census), a small post-enumeration survey (PES) was undertaken in association with the census field work. The purpose of the surveys, once again, was to attempt to measure the degree of under or over enumeration in the census and to assess the extent to which census data were mis-reported.

The survey was designed, as in the previous censuses, to cover at least two randomly selected holdings in each enumeration area. Selected holdings were re-interviewed by field supervisors immediately after completion of the data collection work by enumerators. Re-interviewing was to be undertaken independently of the main census. The survey was undertaken using the same questionnaire as in the man census.

The PES was undertaken all districts. The survey data, however, were not processed for some administrative reason.

APPENDIX 1
SAMPLING SPECIFICATIONS - DISTRICTS

DISTRICT	CODE	ENUMERATION AREA SELECTED	TOTAL HOLDINGS	SAMPLE HOLDINGS	SAMPLING FRACTION (%)	SAMPLE WEIGHT
ESTERN MOUNTAIN						
Taplejung	1	58	23,444	1,359	5.8	17.3
Sankhuwasabha	9	67	29,983	1,555	5.2	19.3
Solukhumbu	11	56	21,478	1,348	6.3	15.9
ESTERN HILL						
Panchthar	2	63	36,664	1,486	4.1	24.7
Ilam	3	72	57,950	1,718	3.0	33.7
Dhankuta	7	67	31,382	1,603	5.1	19.6
Terhathum	8	58	19,608	1,439	7.3	13.6
Bhojpur	10	68	36,832	1,639	4.4	22.5
Okhaldhunga	12	59	30,451	1,420	4.7	21.4
Khotang	13	79	40,358	1,900	4.7	21.2
Udayapur	14	66	54,919	1,601	2.9	34.3
ESTERN TERAI						
Jhapa	4	107	120,538	2,405	2.0	50.1
Morang	5	106	126,891	2,461	1.9	51.6
Sunsari	6	89	86,650	2,158	2.5	40.2
Saptari	15	94	89,241	2,334	2.6	38.2
Siraha	16	90	88,527	2,135	2.4	41.5
CENTRAL MOUNTAIN						
Dolakha	22	50	40,718	1,156	2.8	35.2
Sindhupalchok	23	80	58,998	1,878	3.2	31.4
Rasuwa	29	50	8,504	1,216	14.3	7.0
CENTRAL HILL						
Sindhuli	20	68	51,233	1,676	3.3	30.6
Ramechhap	21	67	40,888	1,555	3.8	26.3
Kavre	24	79	68,872	1,878	2.7	36.7
Lalitpur	25	53	33,616	1,230	3.7	27.3
Bhaktapur	26	50	30,631	1,102	3.6	27.8
Kathmandu	27	53	51,462	1,232	2.4	41.8
Nuwakot	28	72	53,984	1,772	3.3	30.5
Dhading	30	71	64,517	1,647	2.6	39.2
Makwanpur	31	67	67,111	1,590	2.4	42.2

DISTRICT	CODE	ENUMERATION AREA SELECTED	TOTAL HOLDINGS	SAMPLE HOLDINGS	SAMPLING FRACTION (%)	SAMPLE WEIGHT
CENTRAL TERAI						
Dhanusa	17	91	96,006	2,232	2.3	43.0
Mahottari	18	85	80,844	1,985	2.5	40.7
Sarlahi	19	92	98,288	2,261	2.3	43.5
Rautahat	32	89	79,233	2,137	2.7	37.1
Bara	33	94	81,292	2,443	3.0	33.3
Parsa	34	85	59,496	2,075	3.5	28.7
Chitawan	35	83	88,242	2,052	2.3	43.0
WESTERN MOUNTAIN						
Manang	41	50	993	993	100.0	1.0
Mustang	42	50	2,420	1,219	50.4	2.0
WESTERN HILL						
Gorkha	36	73	57,671	1,748	3.0	33.0
Lamjung	37	68	33,041	1,636	5.0	20.2
Tanahu	38	72	59,233	1,660	2.8	35.7
Syangja	39	83	57,613	1,965	3.4	29.3
Kaski	40	77	53,268	1,829	3.4	29.1
Myagdi	43	52	22,480	1,288	5.7	17.5
Parbat	44	62	28,644	1,530	5.3	18.7
Baglung	45	73	51,663	1,767	3.4	29.2
Gulmi	46	65	57,705	1,597	2.8	36.1
Palpa	47	64	48,830	1,529	3.1	31.9
Arghakhanchi	51	61	43,422	1,439	3.3	30.2
WESTERN TERAI						
Nawalparasi	48	89	101,337	2,179	2.2	46.5
Rupandehi	49	99	104,174	2,314	2.2	45.0
Kapilbastu	50	96	74,770	2,366	3.2	31.6
MID-WESTERN MOUNTAIN						
Dolpa	62	50	6,696	1,313	19.6	5.1
Jumla	63	50	17,774	1,250	7.0	14.2
Kalikot	64	50	21,528	1,235	5.7	17.4
Mugu	65	50	9,174	1,249	13.6	7.3
Humla	66	50	8,306	1,279	15.4	6.5

DISTRICT	CODE	ENUMERATION AREA SELECTED	TOTAL HOLDINGS	SAMPLE HOLDINGS	SAMPLING FRACTION (%)	SAMPLE WEIGHT
MID-WESTERN HILL						
Pyuthan	52	58	44,423	1,418	3.2	31.3
Rolpa	53	56	40,284	1,358	3.4	29.7
Rukum	54	63	37,759	1,513	4.0	25.0
Salyan	55	67	42,840	1,635	3.8	26.2
Surkhet	59	72	56,571	1,768	3.1	32.0
Dailekh	60	63	45,079	1,533	3.4	29.4
Jajarkot	61	53	28,546	1,333	4.7	21.4
MID-WESTERN TERAI						
Dang	56	91	86,623	2,162	2.5	40.1
Banke	57	81	61,433	1,998	3.3	30.7
Bardiya	58	84	68,063	2,005	2.9	33.9
FAR-WESTERN MOUNTAIN						
Bajura	67	50	22,611	1,209	5.3	18.7
Bajhang	68	50	32,446	1,194	3.7	27.2
Darchula	75	50	22,420	1,233	5.5	18.2
FAR-WESTERN HILL						
Achham	69	52	44,986	1,292	2.9	34.8
Doti	70	56	36,840	1,361	3.7	27.1
Dadeldhura	73	50	24,797	1,186	4.8	20.9
Baitadi	74	51	43,544	1,264	2.9	34.4
FAR-WESTERN TERAI						
Kailali	71	103	111,662	2,509	2.2	44.5
Kanchanpur	72	88	70,573	2,103	3.0	33.6

APPENDIX 2

SAMPLE DESIGN AND ESTIMATION SPECIFICATIONS

1. SAMPLE DESIGN AND SELECTION[1]

The sample design of the 2011/12 agricultural census (the 2012 census) is stratified two stage sampling with districts as strata, wards as first stage units (FSUs) in rural areas, enumeration areas (EAs) as FSUs in urban areas. In the following, FSUs in rural as well as urban areas are collectively called "EAs". Agricultural holdings are considered as second stage units (SSUs).

Within a specific district k, the sample is selected as follows:

first stage units: $\mathbf{n_k}$ enumeration areas (EAs) are selected following probability proportional to size systematic (PPS systematic) sampling with probability, $\mathbf{P_{ki}}$, proportional to size (the estimated number of holdings $\boldsymbol{M'_{ki}}$ in i^{th} EA as reported in population census 2011);

second stage units: within each selected EA, m_{ki} holdings are selected with equal probability systematic sampling. However, before selection, an implicit stratification is used by making four implicit strata as follows:

1) holdings operating less than 1 bigha/10 ropani of land

2) holdings operating 1 bigha/10 ropani or more of land but less than 3 bigha/20 ropani of land

3) holding operating 3 bigha/20 ropani or more of land

4) holdings having no land but keeping livestock

The same stratification was also used in the agricultural census of 1991-92. The implicit stratification has got partial advantages of stratification without making strata explicitly and going for independent selections within each stratum.

The total sample size of EAs across the country was estimated to be 5,200 with 25 SSUs within each EA (a target number of sample holdings). The sample size of 5,200 EAs was based on considerations of providing district level estimates and the level of precisions of important characteristics as obtained in the earlier Agricultural Census of 1991-92. It may also be remarked that the sample size of number of wards/ EAs followed in both the earlier agricultural censuses of 1991-92 and 2001-02 was 5,100. Districts are taken as strata and total sample size of 5,200 EAs was allocated to different strata following compromise power allocation (in proportion to x^{λ}, where x is the size measure and the parameter λ=0.4).

As in the 1992 agricultural census, the sample is designed to be self-weighting within each district; that is all holdings within a district have the same chance of selection in the sample. The procedure for achieving

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[1]Based on "Mission Report" of A. K. Srivastava, FAO International Consultant (Sampling Methodology), November 2011, Recommendations, p. 21.

this is available in a technical report on "Reliability of Data" published by the Central Bureau of Statistics (CBS), Nepal in 1994.[2]

In order to achieve the self-weighting process, the number of holdings, m_{ki}, was designed to be fixed as:

$$m_{ki} = 25 \, \frac{M_{ki}}{M_{ki}^{'}},$$

where,

$M_{ki}^{'}$ = number of agricultural households in EA i in district k as estimated from the 2011 population census,

M_{ki} = actual number of holdings in EA i in district k as recorded in the 2012 agricultural census enumeration,

It was expected that, M_{ki} and M'_{ki} will usually be almost the same. For operational purposes, the number of selected holdings was set at 25 if :

$$0.98 < \frac{M_{ki}^{'}}{M_{ki}} < 1.02$$

If this relationship was not fulfilled, then field staffs were required to calculate the required number of holdings, m_{ki}, according to the above expression, using procedures given in instruction sample selection manuals.

The PPS selection of the sample of EAs within each district was undertaken as follows[3]:

Define,

N = number of EAs in the district,

n = number of EAs to be selected in the district,

z_i = the measure of size (MoS –number of agricultural households in this case) for the ith EA in the district, $Z = \sum_{i=1}^{N} z_i$,

$$p_i = \frac{z_i}{Z}, \quad i = 1, 2, 3, \dots \dots, N,$$

$$\pi_i = np_i, \quad i = 1, 2, 3, \dots \dots, N.$$

The π_i values are the selection probabilities for the ith EA. The PPS systematic sampling selection procedure for selection of EAs is described in the following steps.

[2]CBS, 1994. National Sample Census of Agriculture, Nepal, 1991/92, Reliability of Data, technical Report, appendix 2, pp. 21-22.
[3]Srivastava, A. K., "Probability Proportional to Size (PPS) Systematic Sampling", Mission Report November 2011, Annexure 6, p. 32.

<u>Step 1</u>: In this step, the procedure of implicit stratification is first described. For this purpose, administrative posts (PAs) are considered as implicit strata. Sort out the list of EAs in the stratum by PAs. Within a PA, arrange the EAs in ascending order of measure of size (MoS); then in the next PA arrange the EAs in descending order of MoS. Continue this sorting by alternating between ascending and descending order sorting from one PA to the next. This type of sorting helps in improving the efficiency of PPS systematic sampling by taking the advantage of stratification implicitly.

Step 2: Check that $np_i \prec 1$, i.e. z_i is less than $\dfrac{Z}{n}$ for all i in the stratum.

Step 3: Compute cumulative total

$$C_1 = \pi_1,$$

$$C_2 = C_1 + \pi_1,$$

$$..... \quad .....$$

$$C_{N-1} = C_{N-2} + \pi_{N-1},$$

$$C_N = C_{N-1} + \pi_N \quad \text{(Note that } C_N = n\text{)}.$$

Step 4: Generate a random number "r" between 0 and 1. Compute the numbers $r_i = r+i-1$,

    With i = 1, 2, 3, … …, n+2.

Step 5: Select the n EAs with the labels i_1, i_2, i_3, ….. ….., i_n such that

$$C_{i_1 - 1} \prec r_1 \leq C_{i_1},$$

$$C_{i_2 - 1} \prec r_2 \leq C_{i_2},$$

$$C_{i_3 - 1} \prec r_3 \leq C_{i_3},$$

$$..... \quad .....$$

$$C_{i_n - 1} \prec r_n \leq C_{i_n}.$$

The procedure yields a sample of size n with PPS systematic sampling and the selection probabilities are given by $\pi_i = np_i$; i=1, 2, 3, ….., N.

For each selected EA, a list of holdings is prepared and ordered according by stratum (see details in Chapter 1). A systematic random sample is selected by applying a sampling interval of I to the holdings in the EA, where I is calculated as:

$$I = \frac{\textit{number of holdings recorded in the EA in the } 2012 \textit{ census listing}}{\textit{number of holdings to be selected in the EA}}$$

2. ESTIMATION

All parameters are estimated at district level first, and development region, ecological belt and national estimates are obtained by aggregating across districts.Estimation of totals[4]

Sample weights – Sampling weights are needed for developing the estimates for various parameters (such as population total or mean). Estimates for such parameters are linear in nature with sample observations suitably weighted with appropriate sampling weights.

The unit of observation in the 2012 census is operational holding, whereas sampling units are agricultural households. The weighting procedure is essentially based on three types of weights: base weights, non-response adjustments, and post-stratification adjustments.

Base weights – Base weights are the inverse of selection probabilities for individual holdings which are the units of observation. Since the selection probabilities are associated with the units of selection, which are agricultural households in this case, the agricultural households associated with the holding provide the base weights for the holdings. In the Nepal's context, "the holding is generally the same as a household".

In two stage sampling, the selection probability of a SSU is the product of selection probability of corresponding PSU and the conditional selection probability of SSU for the given PSU. In the present case, EAs are PSUs which are selected with PPS systematic sampling and agricultural households are SSUs which are selected with equal probability sampling.

Let π_I be the probability of selection for i^{th} PSU (i. e. EA) and $\pi_{j/I}$ be the conditional probability for selecting j^{th} SSU (household) in the ith PSU, then the probability of selection for j^{th} SSU in i^{th} PSU is given by

$\pi_{ij} = \pi_i \pi_{j/i}$.

In this case, $\pi_i = n \dfrac{X_i}{X}$,

where,

X_i is the measure of size (number of agricultural holdings in i^{th} EA as per the 2011 population census), and

X is the sum of X_i in the specific stratum to which i^{th} EA belongs.

Also, $\pi_{j/i} = \dfrac{m}{M_i}$,

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[4]Srivastava, A. K., "Main Findings and Observations", Mission Report November 2011, , pp. 18-19.

where,

M_i is the number of agricultural holdings in i^{th} EA as observed at the time of field work for preparing the frame, and

m is the number of households selected in each EA.

Thus, $\pi_{ij} = \dfrac{nmX_i}{XM_i}$.

In case when $X_i = M_i$, $\pi_{ij} = \dfrac{nm}{X}$.

Non-response adjustments–The sampling weights described above are based on the planned sample sizes. However, invariably, there is some amount of non-response in every survey, which disturbs the weights. Therefore, there is a need for adjusting for non-response. Normally, the non-response adjustments are done within each EA. The adjustment factor is (m/r), where m is the number of sampled holdings while r is the number of responding households.

Final weights – The final weights are the product of base weight and non-response adjustments.

It is observed that since the MoS $X_i = M_i$, the sampling design is self-weighting and the estimation procedure becomes pretty simple. The estimation procedure followed in 1991-92 Agricultural Census is safely applicable For clarity and completeness, the estimation procedure used in 1992 Agricultural Census is described as follows:

The estimation procedure followed in the 1992 Agricultural Census

Parameter to be estimated - district level

The average value of characteristic X per holding in district k is given by:

$$\overline{X_k} = \dfrac{\sum_{s=1}^{N_k} X_{ks}}{M_k} \qquad \text{……………………..……..} (1)$$

where : $X_{ks} = \sum_{j=1}^{M_{ks}} X_{ksj}$

X_{ksj} = value of characteristic X for holding j in EA's and district k .

$M_k = \sum_{s=1}^{N_k} M_{ks}$

The total value of characteristic X in the district k is given by :

$$X_k = \sum_{s=1}^{N_k} X_{ks} \qquad \text{……………………..……..} (2)$$

The ratio fo characteristics X and Y in the district k is given by :

$$R_k = \dfrac{X_k}{Y_k} \qquad \text{……………………..……..} (3)$$

Parameters to be estimated - national level

The average value of characteristic X per holding, pooled over all the 75 districts is given by :

$$\bar{X} = \frac{\sum_{k=1}^{75} X_k}{\sum_{k=1}^{75} M_k} \qquad \text{............................} (4)$$

The total value of characteristic X is given by :

$$X = \sum_{k=1}^{75} X_k \qquad \text{............................} (5)$$

The ratio of characteristics X and Y is given by :

$$R = \frac{X}{Y} \qquad \text{............................} (6)$$

Estimation procedure - district level

Estimate of the average value of characteristic X per holding in district k is given by,

$$\bar{x}_k = \frac{\sum_{i=1}^{n_k} \sum_{j=1}^{m_{ki}} x_{kij}}{\sum_{i=1}^{n_k} m_{ki}} \qquad \text{... ... ...} (1)$$

where,

n_k = number of EAs sampled in district k,

m_{ki} = number of sample holdings in EA i and district k,

x_{kij} = value of characteristic X, as recorded in the census, for holding j in EA i and district k.

The estimate of the total value of characteristic X in district k is given by,

$$x_k = M'_k \bar{x}_k \qquad \text{... ... ...} (2)$$

where, M'_k = estimated number of holdings (from population census) in district k.

The estimate of the ratio of characteristics X and Y in district k is given by,

$$r_k = \frac{x'_k}{y'_k} \qquad \text{... ... ...} (3)$$

The estimate of the number of units with a certain characteristic is given by,

$x_{kij} = 1$ if the unit has the characteristic in question, and

$x_{kij} = 0$ if the unit does not have the characteristic.

Estimation procedure - national level

Estimate of the average value of characteristic X per holding in district k is given by,

The estimate of the ratio of characteristics X and Y in district k is given by,

$$r_k = \frac{x'_k}{y'_k} \qquad \text{... ... ...} (3)$$

The estimate of the number of units with a certain characteristic is given by,

$x_{kij} = 1$ if the unit has the characteristic in question, and

$x_{kij} = 0$ if the unit does not have the characteristic.

Estimation procedure - national level

Estimate of the average value of characteristic X per holding in district k is given by,

$$\bar{x} = \frac{\sum_{k=1}^{75} M'_k \, \bar{x}_k}{\sum_{k=1}^{75} M'_k} \qquad \ldots \ldots \ldots (1)$$

where,

M'_k = estimated number of holdings (from population census) in district k,

$\bar{x}_k$ = estimated average value of characteristic x per holding in district k.

The estimate of the total value of characteristic X in district k is given by,

$$x' = \sum_{k=1}^{75} M'_k \, \bar{x}_k \qquad \ldots \ldots \ldots (2)$$

The estimate of the ratio of characteristics X and Y in district k is given by,

$$r = \frac{x'}{y'} \qquad \ldots \ldots \ldots (3)$$

Estimate of development regions and ecological belts are formed by aggregating across the relevant districts making up the area in the same way as for national estimates.

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3. ESTIMATION OF ERROR

As the sampling designed followed in the 2012 agricultural census is broadly similar to that of the 1992 agricultural census, the estimation procedure for sampling variances is similar to that described in the "Reliability of Data" published by the CBS in 1994[5]. The following is the procedure described in this report published in 1994.

Standard errors were estimated using the sub-sample method. In each districts, sample EAs were assigned to 10 sub-samples, with the same number of EAs in each sub-sample.

To estimate the standard errors on the estimate of average per holding for characteristics X in district k, the estimate of average is first calculated for each sub-sample g as follows;

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[5]Srivastava, A. K., "Main Findings and Observations", Mission Report November 2011, , p. 19.

$$\overline{x}_{kg} = \frac{\displaystyle\sum_{i=1}^{n_k/10}\sum_{j=1}^{m_{ki}} x_{kij}^{(g)}}{\displaystyle\sum_{j=1}^{n_k/10} m_{ki}}$$

where:

$x_{kij}^{(g)}$ = the value of characteristics x in district k, EA i and holding j for sub-sample g (g = 1, 2, ….., 10);

The standard errors of the estimate of average per holding for characteristics X in district k is given by;

$$s\left(\overline{x}_k\right) = \sqrt{\frac{\displaystyle\sum_{g=1}^{10}\left(\overline{x}_{kg} - \overline{x}_k\right)^2}{90}} ,$$

where $\overline{x}_k = \dfrac{\displaystyle\sum_{g=1}^{10}\overline{x}_{kg}}{10}$

The standard errors of the estimate of total for characteristic X in district k is given by;

$$s\left(x_k^{'}\right) = M_k^{'}\, s\left(\overline{x}_k\right)$$

The standard error of the estimate of total for characteristic X at the national level is given by;

$$s\left(x'\right) = \sqrt{\sum_{k=1}^{75} s^2\left(x_k^{'}\right)}$$

The standard error of the estimate of average per holding for characteristic X at the national level is given by;

$$s\left(\overline{x}\right) = \frac{s\left(x'\right)}{\sqrt{\displaystyle\sum_{k=1}^{75} M_k^{'}}}$$

Standard errors for ecological belts and development regions are formed aggregating across the relevant districts making up the area in the same way as for standard errors on national estimates.

4. ESTIMATION OF SAMPLE DESIGN PARAMETERS

The estimation procedures of sample design parameters is similar to that of the 1992 agricultural census described in the "Reliability of Data" by the CBS published in 1994.

The design effect measures the variance of an estimate in comparison with the variance which would have been obtained if simple random sampling had been used. The design effect d_k for characteristics X in district k is estimated as:

$$d_k = \frac{s^2\left(\bar{x}_k\right) x\, m_k}{s^2\left(x_{kij}\right)}$$

where:

$$s^2\left(x_{kij}\right) = \frac{1}{m_k - 1} \sum_{j=1}^{n_k} \sum_{j=1}^{m_{ki}} \left(x_{kij} - \bar{x}_k\right)^2$$

$$m_k = \sum_{i=1}^{n_k} m_{ki}$$

The coefficient of variation is given by:

$$cv_k = \frac{s\left(x_{kij}\right)}{\bar{x}_k}$$

The measure of homogeneity for characteristic x in district k is estimated as:

$$\delta_k = \frac{d_k - 1}{m_k - 1}$$

where:

$\overline{m}_k$ = average sample holdings per EA in district k.

δ_k is a measure of the relationship between the variability of the first and second stages of sampling. If the variability within EAs is high in comparison with the variability between EAs, then δ_k will be small. If on the other hand EAs are very homogeneous δ_k will be high.

δ_k is influenced by the size of EAs - the larger EAs are, the more heterogeneous will they be and therefore δ_k will be lower.

In assessing the sample design for future censuses, decisions will need to take on how many EAs to sample, and then how many holdings to sample within each selected EA. This decision is based on variance and cost (or time) factors.

The total cost of conduction the Census enumeration in district k can be represented as:

$C_k = C_{ko} + n_k C_{k1} + n_k \overline{m}_k C_{k2}$

where :

C_{ko}= overhead costs

C$_{k1}$ = average costs associated with each of the first stage units (e.g. listing, travel to EAs); and

C$_{k2}$ =average costs associated with each of the second stage units in each EA (e.g. interviewing holdings).

The optimum number of sample holdings to sample per EA is calculated as:

$$opt\left(\overline{m}_{k}\right) = \sqrt{\frac{C_{k1}}{C_{k2}} \frac{1-\delta_{k}}{\delta_{k}}}$$

A low C_{k2} means interviewer costs are low and therefore $\overline{m}_{k}$ should be high. A high C_{k2} means that interviewer costs are high and therefore $\overline{m}_{k}$ should be low. High within EA variability means a low δ_{k} implying the need for a large $\overline{m}_{k}$. Low within EA variability means a high δ_{k} and therefore a low $\overline{m}_{k}$.

APPENDIX 3

STANDARED ERROR TABLES

TABLE A3.1: STANDARED ERROR - DEVELOPMENT REGIONS

TABLE A3.2: STANDARED ERROR - ECOLOGICAL BELTS

TABLE A3.3: STANDARED ERROR - DISTRICTS

TABLE A3.1 NATIONAL SAMPLE CENSUS OF AGRICULTURE, 2011/12
STANDARD ERRORS - DEVELOPMENT REGION

	Census estimate	Standard error	Relative standard error %	Census estimate	Standard error	Relative standard error %
		Eastern			Central	
Total area of holdings (ha)	755,178	10,460	1.4	716,861	7,756	1.1
Area of temporari crops (ha)	628,976	16,612	1.5	637,970	13,554	1.1
Area under paddy (ha)	482,006	6,661	1.4	447,348	5,683	1.3
Area under maize(ha)	190,458	2,638	1.4	206,551	3,409	1.7
Area under wheat (ha)	157,585	4,227	2.7	229,266	3,518	1.5
Area under potato (ha)	37,467	1,535	4.1	35,791	1,399	3.9
Area of irrigated land (ha)	394,392	7,487	1.9	429,457	5,724	1.3
Total paddy production(qtl)	13,030,030	232,813	1.8	14,530,407	233,239	1.6
Total maize production (qtl)	4,245,475	66,905	1.6	5,271,785	101,060	1.9
Total wheat production (qtl)	3,396,204	101,554	3.0	5,676,893	119,292	2.1
Total potato production (qtl)	4,881,499	200,065	4.1	4,836,317	178,672	3.7
Farm population	4,634,993	17,879	0.4	6,366,835	28,188	0.4
		Western			Mid-western	
Total area of holdings (ha)	482,548	6,491	1.3	353,624	5,141	1.5
Area of temporari crops (ha)	371,738	9,340	1.4	298,960	9,016	1.6
Area under paddy (ha)	244,834	4,327	1.8	153,011	3,451	2.3
Area under maize(ha)	136,411	2,233	1.6	108,902	1,831	1.7
Area under wheat (ha)	97,722	2,455	2.5	139,594	2,444	1.8
Area under potato (ha)	14,159	426	4.1	11,176	456	4.1
Area of irrigated land (ha)	209,769	3,594	1.7	152,516	3,191	2.1
Total paddy production(qtl)	7,417,847	160,522	2.2	4,651,449	113,896	2.4
Total maize production (qtl)	3,345,199	54,651	1.6	2,272,294	35,788	1.6
Total wheat production (qtl)	2,544,386	80,662	3.2	3,056,249	60,135	2.0
Total potato production (qtl)	1,807,122	54,741	3.0	1,415,417	59,040	4.2
Farm population	3,999,572	22,668	0.6	3,158,172	16,416	0.5
		Far-western			Total Nepal	
Total area of holdings (ha)	217,430	4,388	2.0	2,525,639	16,044	0.6
Area of temporari crops (ha)	185,653	7,780	2.2	2,123,297	26,243	0.7
Area under paddy (ha)	128,784	2,816	2.2	1,455,983	10,734	0.7
Area under maize(ha)	31,382	1,119	3.6	673,704	5,308	0.8
Area under wheat (ha)	125,227	3,012	2.4	749,395	7,164	1.0
Area under potato (ha)	6,989	226	3.2	105,582	2,180	2.1
Area of irrigated land (ha)	127,272	3,173	2.5	1,313,406	11,045	0.8
Total paddy production(qtl)	3,609,059	72,632	2.0	4,323,879	390,662	0.9
Total maize production (qtl)	636,738	22,629	3.6	1,577,149	139,531	0.9
Total wheat production (qtl)	2,541,081	68,062	2.7	1,721,481	198,239	1.2
Total potato production (qtl)	828,275	24,678	3.0	1,376,863	281,142	2.0
Farm population	2,392,971	15,339	0.6	20,552,543	46,183	0.2

TABLE A3. 2: NATIONAL SAMPLE CENSUS OF AGRICULTURE, 2011/12
STANDARD ERRORS - ECOLOGICAL BELTS

Data item	Census estimate	Standard error	Relative standard error %	Census estimate	Standard error	Relative standard error %
			Mountain			Hill
Total area of holdings (ha)	213931.5	3624	1.7	986073.2	8061	0.8
Area of temporari crops (ha)	170375	5110	1.7	733430	10714	0.8
Area under paddy (ha)	61,725	1643	2.7	309,454	2999	1.0
Area under maize(ha)	74,186	1443	9.3	453,129	4375	1.0
Area under wheat (ha)	56,731	1655	2.9	185,887	2142	1.2
Area under potato (ha)	18,620	955	5.1	48,747	1634	3.4
Area of irrigated land (ha)	58378	1718	2.9	270273	2645	1.0
Total paddy production(qtl)	1,308,629	47149	3.6	8,192,413	100364	1.2
Total maize production (qtl)	1,589,168	32805	2.1	10,189,152	98085	1.0
Total wheat production (qtl)	951,121	27773	2.9	3,721,162	41411	1.1
Total potato production (qtl)	2,293,906	122750	5.4	6,359,622	211633	3.3
Farm population	1695538	10528	0.6	8614984	25305	0.3
			Tarai			Total Nepal
Total area of holdings (ha)	1325634.5	13390	1.0	2,525,639	16,044	0.6
Area of temporari crops (ha)	1219492	23405	1.0	2,123,297	26,243	0.7
Area under paddy (ha)	1,084,803	10175	0.9	1,455,983	10,734	0.7
Area under maize(ha)	146,389	2637	1.8	673,704	5,308	0.8
Area under wheat (ha)	506,777	6633	1.3	749,395	7,164	1.0
Area under potato (ha)	38,215	1082	2.8	105,582	2,180	2.1
Area of irrigated land (ha)	984756	10585	1.1	1,313,406	11,045	0.8
Total paddy production(qtl)	33,737,750	374595	1.1	4,323,879	390,662	0.9
Total maize production (qtl)	3,993,171	93660	2.3	1,577,149	139,531	0.9
Total wheat production (qtl)	12,542,530	191866	1.5	1,721,481	198,239	1.2
Total potato production (qtl)	5,115,102	138508	2.7	1,376,863	281,142	2.0
Farm population	10242020	37171	0.4	20,552,543	46,183	0.2

Data item	Census estimate	Standard error	Relative standard error %	Census estimate	Standard error	Relative standard error %
Eastrn Mountain		District 01 Taplejung			District 09 Sankhuwasabha	
Total area of holdings (ha)	22,328	1,243	5.6	28,956	557	1.9
Area of temporari crops (ha)	14,673	1,901	7.0	22,197	1,141	3.2
Area under paddy (ha)	5,441	359	6.6	14,106	630	4.5
Area under maize(ha)	9,799	654	6.7	10,086	623	6.2
Area under wheat (ha)	1,809	227	12.5	2,051	179	8.7
Area under potato (ha)	1,496	373	24.9	2,048	277	13.5
Area of irrigated land (ha)	7,058	323	4.6	10,013	482	4.8
Total paddy production(qtl)	9,862	6,570	6.7	24,449	9,581	3.9
Total maize production (qtl)	20,672	15,429	7.5	21,337	12,310	5.8
Total wheat production (qtl)	2,984	3,643	12.2	3,319	2,847	8.6
Total potato production (qtl)	19,396	48,373	12.2	26,617	36,043	8.6
Farm population	111,976	2,037	1.8	148,450	2,433	1.6
		District 11 Solukhumbu			**Total Eastern Mountain**	
Total area of holdings (ha)	19,117	1,386	7.2	70,400	1,943	2.8
Area of temporary crops (ha)	15,181	1,639	8.6	52,051	2,757	3.3
Area under paddy (ha)	1,512	134	8.9	21,060	737	3.5
Area under maize(ha)	5,525	448	8.1	25,410	1,008	4.0
Area under wheat (ha)	2,812	275	9.8	6,672	399	6.0
Area under potato (ha)	3,518	382	10.9	7,062	601	8.5
Area of irrigated land (ha)	2,261	178	7.9	19,333	607	3.1
Total paddy production(qtl)	2,850	2,158	7.6	37,161	11,816	3.2
Total maize production (qtl)	12,222	9,759	8.0	54,231	22,019	4.1
Total wheat production (qtl)	4,948	4,473	9.0	11,251	6,433	5.7
Total potato production (qtl)	46,258	48,671	9.0	92,271	77,510	8.4
Farm population	99,376	2,412	2.4	359,801	3,986	1.1

Data item	Census estimate	Standard error	Relative standard error %	Census estimate	Standard error	Relative standard error %
	District 02 Panchthar			District 03 Illam		
Total area of holdings (ha)	28,726	786	2.7	53,394	2,548	4.8
Area of temporari crops (ha)	17,165	1,744	5.4	28,167	2,395	4.3
Area under paddy (ha)	5,591	391	7.0	13,947	559	4.0
Area under maize(ha)	12,297	847	6.9	18,905	776	4.1
Area under wheat (ha)	952	104	11.0	1,908	218	11.4
Area under potato (ha)	2,607	249	9.6	4,195	618	14.7
Area of irrigated land (ha)	5,563	286	5.1	18,396	868	4.7
Total paddy production(qtl)	10,441	7,762	7.4	39,596	19,668	5.0
Total maize production (qtl)	15,936	9,675	6.1	41,084	17,156	4.2
Total wheat production (qtl)	1,598	1,750	11.0	5,004	6,259	12.5
Total potato production (qtl)	33,842	32,385	11.0	55,044	79,989	12.5
Farm population	179,224	3,126	1.7	272,378	5,531	2.0
	District 07 Dhankuta			District 07 Terhathum		
Total area of holdings (ha)	25,489	1,026	4.0	19,102	856	4.5
Area of temporari crops (ha)	18,254	998	3.3	15,230	1,440	6.0
Area under paddy (ha)	5,444	394	7.2	6,324	332	5.2
Area under maize(ha)	12,092	500	4.1	9,637	583	6.0
Area under wheat (ha)	279	36	13.0	782	111	14.2
Area under potato (ha)	1,120	241	21.5	726	183	25.2
Area of irrigated land (ha)	5,272	319	6.1	6,432	320	5.0
Total paddy production(qtl)	10,767	9,838	9.1	11,922	7,039	5.9
Total maize production (qtl)	25,849	10,628	4.1	21,209	10,269	4.8
Total wheat production (qtl)	630	766	12.2	1,300	1,697	13.1
Total potato production (qtl)	14,402	30,294	12.2	9,344	23,604	13.1
Farm population	150,528	2,379	1.6	95,792	1,521	1.6
	District 10 Bhojpur			District 12 Okhaldhunga		
Total area of holdings (ha)	29,776	1,546	5.2	28,547	2,110	7.4
Area of temporari crops (ha)	24,421	1,536	4.1	19,039	1,917	5.6
Area under paddy (ha)	11,913	611	5.1	4,714	230	4.9
Area under maize(ha)	13,227	568	4.3	13,847	954	6.9
Area under wheat (ha)	747	99	13.3	2,744	254	9.3
Area under potato (ha)	1,836	379	20.7	3,566	876	24.6
Area of irrigated land (ha)	10,557	568	5.4	4,679	275	5.9
Total paddy production(qtl)	26,438	17,770	6.7	9,108	6,638	7.3
Total maize production (qtl)	28,266	11,765	4.2	29,615	20,222	6.8
Total wheat production (qtl)	1,250	1,570	12.6	4,531	4,099	9.0
Total potato production (qtl)	23,810	49,245	12.6	46,318	113,972	9.0
Farm population	177,845	2,459	1.4	145,157	2,410	1.7

Data item	Census estimate	Standard error	Relative standard error %	Census estimate	Standard error	Relative standard error %
	District 13 Khotang			District 14 Udayapur		
Total area of holdings (ha)	31,350	700	2.2	28,162	513	1.8
Area of temporari crops (ha)	25,119	1,090	2.3	25,534	823	1.7
Area under paddy (ha)	9,915	463	4.7	16,583	817	4.9
Area under maize(ha)	18,099	758	4.2	17,414	662	3.8
Area under wheat (ha)	2,441	166	6.8	1,568	129	8.2
Area under potato (ha)	2,690	588	21.9	763	74	9.7
Area of irrigated land (ha)	7,211	266	3.7	11,529	443	3.8
Total paddy production(qtl)	19,529	10,486	5.4	45,105	24,917	5.5
Total maize production (qtl)	38,846	16,092	4.1	37,590	15,646	4.2
Total wheat production (qtl)	4,042	2,640	6.5	3,993	3,236	8.1
Total potato production (qtl)	34,916	76,449	6.5	9,738	9,476	8.1
Farm population	199,687	2,885	1.4	300,254	4,639	1.5
Total Eastrn Hill						
Total area of holdings (ha)	244,546	4,060	1.7			
Area of temporari crops (ha)	172,929	4,444	1.4			
Area under paddy (ha)	74,431	1,428	1.9			
Area under maize(ha)	115,519	2,038	1.8			
Area under wheat (ha)	11,421	437	3.8			
Area under potato (ha)	17,501	1,341	7.7			
Area of irrigated land (ha)	69,639	1,306	1.9			
Total paddy production(qtl)	172,905	104,117	6.0			
Total maize production (qtl)	238,395	40,711	1.7			
Total wheat production (qtl)	22,347	9,078	4.1			
Total potato production (qtl)	227,413	173,986	7.7			
Farm population	1,520,865	9,489	0.6			

TABLE A3. 3: (continued) NATIONAL SAMPLE CENSUS OF AGRICULTURE, 2011/12
STANDARD ERRORS - DISTRICT
EASTERN TERAI

Data item	Census estimate	Standard error	Relative standard error %	Census estimate	Standard error	Relative standard error %
	District 04 Jhapa			District 05 Morang		
Total area of holdings (ha)	102,443	4,413	4.3	109,943	4,801	4.4
Area of temporari crops (ha)	92,488	7,121	4.8	103,526	8,998	4.7
Area under paddy (ha)	93,590	3,220	3.4	100,911	4,023	4.0
Area under maize(ha)	28,983	915	3.2	12,896	708	5.5
Area under wheat (ha)	6,422	398	6.2	37,346	3,013	8.1
Area under potato (ha)	3,715	236	6.3	3,326	183	5.5
Area of irrigated land (ha)	54,774	2,437	4.5	83,577	4,209	5.0
Total paddy production(qtl)	261,336	111,248	4.3	283,206	143,092	5.1
Total maize production (qtl)	72,414	34,773	4.8	37,811	19,973	5.3
Total wheat production (qtl)	17,965	11,469	6.4	70,401	68,807	9.8
Total potato production (qtl)	48,070	30,125	6.4	42,160	22,507	9.8
Farm population	593,017	5,741	1.0	647,861	5,371	0.8
	District 06 Sunsari			District 15 Saptari		
Total area of holdings (ha)	75,141	5,634	7.5	73,908	2,855	3.9
Area of temporari crops (ha)	69,423	7,989	6.2	66,902	4,950	4.0
Area under paddy (ha)	59,209	2,387	4.0	66,673	2,432	3.6
Area under maize(ha)	5,067	592	11.7	411	126	30.6
Area under wheat (ha)	30,449	1,487	4.9	34,470	2,311	6.7
Area under potato (ha)	1,894	243	12.8	2,665	194	7.3
Area of irrigated land (ha)	68,331	4,277	6.3	46,620	2,901	6.2
Total paddy production(qtl)	193,947	93,441	4.8	178,557	82,328	4.6
Total maize production (qtl)	15,972	26,072	16.3	918	3,022	32.9
Total wheat production (qtl)	73,321	36,800	5.0	84,184	58,377	6.9
Total potato production (qtl)	25,863	33,451	5.0	34,780	28,070	6.9
Farm population	474,527	8,434	1.8	517,131	4,530	0.9
	District 16 Siraha			**Total Eastrn Terai**		
Total area of holdings (ha)	78,797	2,596	3.3	440,232	9,442	2.2
Area of temporari crops (ha)	71,657	5,347	4.1	403,996	15,767	2.2
Area under paddy (ha)	66,131	1,903	2.9	386,514	6,464	1.7
Area under maize(ha)	2,173	292	13.4	49,529	1,337	2.7
Area under wheat (ha)	30,806	854	2.8	139,493	4,185	3.0
Area under potato (ha)	1,305	101	7.8	12,904	442	3.4
Area of irrigated land (ha)	52,119	1,903	3.7	305,420	7,347	2.4
Total paddy production(qtl)	175,890	63,385	3.6	1,092,937	228,863	2.1
Total maize production (qtl)	4,807	6,093	12.7	131,921	48,312	3.7
Total wheat production (qtl)	60,151	23,691	3.9	306,022	100,942	3.3
Total potato production (qtl)	17,594	20,640	3.9	168,466	61,213	3.6
Farm population	521,791	7,765	1.5	2,754,327	14,620	0.5

Data item	Census estimate	Standard error	Relative standard error %	Census estimate	Standard error	Relative standard error %
	District 22 Dolakha			District 23 Sindhupalchok		
Total area of holdings (ha)	26,845	833	3.1	34,781	1,586	4.6
Area of temporari crops (ha)	23,460	1,006	2.2	29,781	2,576	4.4
Area under paddy (ha)	6,778	417	6.2	14,241	1,073	7.5
Area under maize(ha)	11,590	434	3.7	18,998	684	3.6
Area under wheat (ha)	9,174	669	7.3	6,406	468	7.3
Area under potato (ha)	4,718	630	13.3	1,752	174	9.9
Area of irrigated land (ha)	6,677	445	6.7	12,435	710	5.7
Total paddy production(qtl)	13,034	5,974	4.6	35,840	40,730	11.4
Total maize production (qtl)	24,682	9,687	3.9	43,238	17,166	4.0
Total wheat production (qtl)	15,151	10,833	7.2	7,274	6,444	8.9
Total potato production (qtl)	60,209	81,881	7.2	22,879	22,324	8.9
Farm population	174,777	4,458	2.6	275,104	3,559	1.3
	District 29 Rasuwa			**Total Central Mountain**		
Total area of holdings (ha)	4,558	233	5.1	66,184	1,807	2.7
Area of temporari crops (ha)	3,998	298	4.5	57,239	2,781	2.5
Area under paddy (ha)	910	74	8.1	21,929	1,153	5.3
Area under maize(ha)	2,515	116	4.6	33,103	818	2.5
Area under wheat (ha)	331	27	8.3	15,911	817	5.1
Area under potato (ha)	724	59	8.2	7,194	656	9.1
Area of irrigated land (ha)	808	62	7.7	19,921	840	4.2
Total paddy production(qtl)	2,107	1,949	9.3	50,981	41,212	8.1
Total maize production (qtl)	5,727	2,816	4.9	73,647	19,911	2.7
Total wheat production (qtl)	567	484	8.5	22,992	12,614	5.5
Total potato production (qtl)	9,415	7,843	8.5	92,502	85,231	9.2
Farm population	41,520	1,357	3.3	491,401	5,864	1.2

Data item	Census estimate	Standard error	Relative standard error %	Census estimate	Standard error	Relative standard error %
	District 20 Sindhuli			District 21 Ramechhap		
Total area of holdings (ha)	26,626	1,077	4.1	30,372	1,663	5.5
Area of temporari crops (ha)	21,912	1,419	3.3	24,728	2,221	5.1
Area under paddy (ha)	13,505	567	4.2	5,553	294	5.3
Area under maize(ha)	17,348	948	5.5	17,838	963	5.4
Area under wheat (ha)	2,017	163	8.1	3,776	171	4.5
Area under potato (ha)	409	62	15.1	2,898	415	14.3
Area of irrigated land (ha)	8,709	328	3.8	5,104	289	5.7
Total paddy production(qtl)	34,140	19,168	5.6	13,300	7,669	5.8
Total maize production (qtl)	43,851	30,869	7.0	41,558	26,533	6.4
Total wheat production (qtl)	4,201	4,155	9.9	6,741	4,257	6.3
Total potato production (qtl)	4,134	6,748	9.9	28,828	41,594	6.3
Farm population	292,236	6,206	2.1	192,029	5,482	2.9
	District 24 Kavre			District 25 Lalitpur		
Total area of holdings (ha)	39,707	2,167	5.5	9,300	1,032	11.1
Area of temporari crops (ha)	29,082	2,139	3.9	6,726	1,135	8.8
Area under paddy (ha)	10,120	421	4.2	2,294	114	5.0
Area under maize(ha)	19,706	1,029	5.2	3,851	618	16.0
Area under wheat (ha)	4,892	301	6.2	1,716	105	6.1
Area under potato (ha)	4,458	445	10.0	179	15	8.6
Area of irrigated land (ha)	11,215	444	4.0	1,941	102	5.3
Total paddy production(qtl)	33,561	23,804	7.1	10,145	6,549	6.5
Total maize production (qtl)	51,887	24,185	4.7	10,199	14,973	14.7
Total wheat production (qtl)	8,975	6,278	7.0	5,401	3,093	5.7
Total potato production (qtl)	60,050	59,320	7.0	3,398	2,481	5.7
Farm population	328,701	7,310	2.2	170,731	2,441	1.4
	District 26 Bhaktapur			District 27 Kathmandu		
Total area of holdings (ha)	5,683	293	5.2	9,596	633	6.7
Area of temporari crops (ha)	5,182	556	5.5	8,355	1,282	8.0
Area under paddy (ha)	3,348	191	5.7	5,074	257	5.1
Area under maize(ha)	1,371	108	7.9	2,521	331	13.1
Area under wheat (ha)	2,362	146	6.2	3,456	112	3.2
Area under potato (ha)	793	138	17.4	1,397	221	15.8
Area of irrigated land (ha)	2,249	181	8.0	3,835	352	9.2
Total paddy production(qtl)	16,595	10,207	6.2	23,458	12,862	5.5
Total maize production (qtl)	4,862	2,894	6.0	8,724	9,227	10.6
Total wheat production (qtl)	7,575	4,933	6.5	10,129	3,962	3.9
Total potato production (qtl)	14,628	24,553	6.5	25,320	39,087	3.9
Farm population	157,046	3,315	2.1	264,954	6,300	2.4

Data item	Census estimate	Standard error	Relative standard error %	Census estimate	Standard error	Relative standard error %
	District 28 Nuwakot			District 30 Dhading		
Total area of holdings (ha)	32,996	1,646	5.0	35,398	589	1.7
Area of temporari crops (ha)	30,222	2,896	4.6	30,991	1,458	2.5
Area under paddy (ha)	19,890	1,483	7.5	15,115	677	4.5
Area under maize(ha)	18,153	907	5.0	20,361	871	4.3
Area under wheat (ha)	5,410	283	5.2	2,584	125	4.8
Area under potato (ha)	2,680	349	13.0	1,714	119	6.9
Area of irrigated land (ha)	13,728	969	7.1	11,464	423	3.7
Total paddy production(qtl)	56,990	53,619	9.4	43,290	31,492	7.3
Total maize production (qtl)	41,360	17,086	4.1	49,162	21,744	4.4
Total wheat production (qtl)	13,882	7,357	5.3	6,354	6,876	10.8
Total potato production (qtl)	34,948	43,506	5.3	22,948	17,516	10.8
Farm population	264,497	2,267	0.9	320,391	5,263	1.6
	District 31 Makwanpur			**Total Central Hill**		
Total area of holdings (ha)	31,803	1,795	5.7	221,482	4,056	1.8
Area of temporari crops (ha)	28,764	3,332	6.0	185,963	6,032	1.7
Area under paddy (ha)	8,327	386	4.6	83,226	1,873	2.3
Area under maize(ha)	23,832	1,547	6.5	124,981	2,713	2.2
Area under wheat (ha)	1,318	143	10.9	27,531	555	2.0
Area under potato (ha)	1,547	235	15.2	16,075	795	4.9
Area of irrigated land (ha)	4,792	258	5.4	63,038	1,319	2.1
Total paddy production(qtl)	23,826	13,085	5.5	255,306	73,098	2.9
Total maize production (qtl)	55,231	37,064	6.7	306,835	68,542	2.2
Total wheat production (qtl)	3,569	3,020	8.5	66,827	15,327	2.3
Total potato production (qtl)	20,755	31,676	8.5	215,008	103,122	4.8
Farm population	349,062	3,654	1.0	2,339,647	14,994	0.6

Data item	Census estimate	Standard error	Relative standard error %	Census estimate	Standard error	Relative standard error %
	District 17 Dhanusa			District 18 Mahottari		
Total area of holdings (ha)	72,307	2,510	3.5	64,977	2,060	3.2
Area of temporari crops (ha)	66,260	5,089	4.1	58,592	3,890	3.7
Area under paddy (ha)	60,236	2,151	3.6	46,675	1,525	3.3
Area under maize(ha)	1,107	210	19.0	2,745	382	13.9
Area under wheat (ha)	35,564	1,269	3.6	24,698	756	3.1
Area under potato (ha)	1,860	131	7.0	1,757	168	9.5
Area of irrigated land (ha)	52,560	1,583	3.0	47,137	2,308	4.9
Total paddy production(qtl)	153,917	68,525	4.5	125,427	67,164	5.4
Total maize production (qtl)	3,370	6,360	18.9	6,343	8,547	13.5
Total wheat production (qtl)	87,173	40,193	4.6	47,369	18,269	3.9
Total potato production (qtl)	25,305	16,716	4.6	23,110	21,928	3.9
Farm population	571,692	6,359	1.1	486,001	10,439	2.1
	District 19 Sarlahi			District 32 Rautahat		
Total area of holdings (ha)	80,678	2,970	3.7	64,835	2,338	3.6
Area of temporari crops (ha)	75,868	4,519	3.6	58,862	3,719	3.4
Area under paddy (ha)	52,094	1,465	2.8	49,811	1,795	3.6
Area under maize(ha)	7,998	950	11.9	5,087	740	14.5
Area under wheat (ha)	28,161	1,134	4.0	28,244	854	3.0
Area under potato (ha)	1,955	252	12.9	1,345	111	8.2
Area of irrigated land (ha)	61,918	2,453	4.0	59,330	1,855	3.1
Total paddy production(qtl)	183,909	76,792	4.2	178,817	97,116	5.4
Total maize production (qtl)	31,228	44,631	14.3	17,947	37,867	21.1
Total wheat production (qtl)	65,429	30,510	4.7	70,925	26,631	3.8
Total potato production (qtl)	27,999	36,749	4.7	19,711	14,281	3.8
Farm population	628,156	9,903	1.6	506,876	9,093	1.8
	District 33 Bara			District 34 Parsa		
Total area of holdings (ha)	56,867	1,863	3.3	48,899	3,105	6.4
Area of temporari crops (ha)	53,584	3,204	2.9	46,206	6,054	6.6
Area under paddy (ha)	52,153	1,619	3.1	44,637	2,806	6.3
Area under maize(ha)	9,274	682	7.3	1,867	207	11.1
Area under wheat (ha)	30,465	1,353	4.4	33,629	2,300	6.8
Area under potato (ha)	3,995	873	21.8	518	78	15.0
Area of irrigated land (ha)	52,048	1,576	3.0	42,489	2,907	6.8
Total paddy production(qtl)	211,508	58,537	2.8	159,384	111,026	7.0
Total maize production (qtl)	32,443	27,107	8.4	6,218	5,952	9.6
Total wheat production (qtl)	90,302	28,951	3.2	101,166	96,126	9.5
Total potato production (qtl)	52,334	107,057	3.2	7,252	10,864	9.5
Farm population	535,968	9,506	1.8	392,846	8,367	2.1

Data item	Census estimate	Standard error	Relative standard error %	Census estimate	Standard error	Relative standard error %
	District 35 Chitwan			**Total Central Terai**		
Total area of holdings (ha)	40,632	1,580	3.9	429,195	6,360	1.5
Area of temporari crops (ha)	35,396	4,171	4.7	394,769	11,815	1.6
Area under paddy (ha)	36,588	2,155	5.9	342,194	5,240	1.5
Area under maize(ha)	20,390	1,202	5.9	48,467	1,895	3.9
Area under wheat (ha)	5,064	286	5.6	185,824	3,377	1.8
Area under potato (ha)	1,093	72	6.6	12,523	945	7.6
Area of irrigated land (ha)	31,015	1,448	4.7	346,498	5,506	1.6
Total paddy production(qtl)	133,790	84,084	6.3	1,146,754	217,621	1.9
Total maize production (qtl)	49,148	28,444	5.8	146,697	71,544	4.9
Total wheat production (qtl)	15,508	12,995	8.4	477,871	117,629	2.5
Total potato production (qtl)	20,411	11,455	8.4	176,121	118,427	6.7
Farm population	414,247	6,696	1.6	3,535,786	23,138	0.7

TABLE A3. 3: (continued) NATIONAL SAMPLE CENSUS OF AGRICULTURE, 2011/12
STANDARD ERRORS - DISTRICT
WESTERN MOUNTAIN

Data item	Census estimate	Standard error	Relative standard error %	Census estimate	Standard error	Relative standard error %
		District 41 Manang			District 42 Mustang	
Total area of holdings (ha)	474	-		1,375	87	6.3
Area of temporari crops (ha)	330	-		893	70	5.6
Area under paddy (ha)	0	-		1	0	31.7
Area under maize(ha)	85	-		127	6	4.4
Area under wheat (ha)	80	-		149	17	11.2
Area under potato (ha)	71	-		166	12	7.4
Area of irrigated land (ha)	122	-		962	74	7.7
Total paddy production(qtl)	0	-		3	10	31.2
Total maize production (qtl)	205	-		182	73	4.0
Total wheat production (qtl)	159	-		259	269	10.4
Total potato production (qtl)	898	-		2,132	1,563	10.4
Farm population	3,488	-		9,142	167	1.8
	Total Western Mountain					
Total area of holdings (ha)	1,848	87	6.3			
Area of temporari crops (ha)	1,224	70	5.6			
Area under paddy (ha)	2	0	31.7			
Area under maize(ha)	212	6	4.4			
Area under wheat (ha)	229	17	11.2			
Area under potato (ha)	237	12	7.4			
Area of irrigated land (ha)	1,084	74	7.7			
Total paddy production(qtl)	3	10	31.2			
Total maize production (qtl)	388	73	4.0			
Total wheat production (qtl)	418	269	10.4			
Total potato production (qtl)	3,030	1,563	7.3			
Farm population	12,630	167	1.8			

Data item	Census estimate	Standard error	Relative standard error %	Census estimate	Standard error	Relative standard error %
	District 36 Grokha			District 37 Lamjung		
Total area of holdings (ha)	31,493	1,375	4.4	17,266	670	3.9
Area of temporari crops (ha)	27,008	2,306	4.8	14,565	735	3.0
Area under paddy (ha)	13,052	683	5.2	10,151	278	2.7
Area under maize(ha)	17,510	937	5.4	7,855	403	5.1
Area under wheat (ha)	943	119	12.6	194	22	11.2
Area under potato (ha)	1,382	142	10.3	518	126	24.4
Area of irrigated land (ha)	11,096	618	5.6	8,856	335	3.8
Total paddy production(qtl)	31,280	21,984	7.0	27,444	12,009	4.4
Total maize production (qtl)	38,911	20,917	5.4	17,932	9,275	5.2
Total wheat production (qtl)	1,945	2,780	14.3	366	396	10.8
Total potato production (qtl)	17,849	18,007	14.3	6,798	16,769	10.8
Farm population	241,868	4,373	1.8	142,464	2,541	1.8
	District 38 Tanahu			District 39 Syangja		
Total area of holdings (ha)	29,022	999	3.4	29,451	934	3.2
Area of temporari crops (ha)	24,262	1,676	3.9	17,597	1,090	3.2
Area under paddy (ha)	10,355	465	4.5	9,114	461	5.1
Area under maize(ha)	16,348	976	6.0	11,953	213	1.8
Area under wheat (ha)	541	87	16.0	2,343	219	9.3
Area under potato (ha)	340	37	10.9	683	60	8.8
Area of irrigated land (ha)	8,023	300	3.7	8,574	440	5.1
Total paddy production(qtl)	28,382	20,697	7.3	23,279	17,058	7.3
Total maize production (qtl)	37,298	18,414	4.9	36,108	6,944	1.9
Total wheat production (qtl)	1,021	1,632	16.0	4,329	4,543	10.5
Total potato production (qtl)	3,108	3,280	16.0	8,833	7,773	10.5
Farm population	268,226	5,906	2.2	253,263	4,574	1.8
	District 40 Kaski			District 43 Myagdi		
Total area of holdings (ha)	23,439	1,281	5.5	12,359	760	6.2
Area of temporari crops (ha)	18,390	1,314	4.4	10,027	1,360	7.2
Area under paddy (ha)	12,406	673	5.4	3,514	215	6.1
Area under maize(ha)	7,070	405	5.7	6,510	536	8.2
Area under wheat (ha)	924	72	7.8	2,648	131	4.9
Area under potato (ha)	673	70	10.4	835	114	13.7
Area of irrigated land (ha)	12,182	659	5.4	3,617	251	6.9
Total paddy production(qtl)	34,692	18,501	5.3	7,463	3,578	4.8
Total maize production (qtl)	16,130	7,645	4.7	20,074	13,889	6.9
Total wheat production (qtl)	1,662	1,310	7.9	4,489	1,959	4.4
Total potato production (qtl)	8,844	9,426	7.9	10,749	14,693	4.4
Farm population	234,041	1,996	0.9	97,652	1,523	1.6

Data item	Census estimate	Standard error	Relative standard error %	Census estimate	Standard error	Relative standard error %
	District 44 Parbat			District 45 Baglung		
Total area of holdings (ha)	12,599	708	5.6	30,687	2,080	6.8
Area of temporari crops (ha)	9,014	1,051	6.0	17,834	1,858	5.4
Area under paddy (ha)	5,195	355	6.8	4,765	250	5.3
Area under maize(ha)	5,844	409	7.0	12,142	778	6.4
Area under wheat (ha)	1,499	114	7.6	5,616	234	4.2
Area under potato (ha)	438	50	11.5	1,718	293	17.0
Area of irrigated land (ha)	5,152	333	6.5	4,055	284	7.0
Total paddy production(qtl)	12,705	8,322	6.6	12,893	8,457	6.6
Total maize production (qtl)	13,217	10,033	7.6	26,974	16,648	6.2
Total wheat production (qtl)	3,052	2,681	8.8	10,054	3,868	3.8
Total potato production (qtl)	5,932	7,193	8.8	22,193	37,595	3.8
Farm population	131,407	2,952	2.2	245,743	5,260	2.1
	District 46 Gulmi			District 47 Palpa		
Total area of holdings (ha)	40,910	1,739	4.3	29,985	1,546	5.2
Area of temporari crops (ha)	18,814	1,497	4.1	20,524	2,683	7.5
Area under paddy (ha)	6,596	315	4.8	8,555	520	6.1
Area under maize(ha)	13,170	491	3.7	13,867	848	6.1
Area under wheat (ha)	3,953	214	5.4	2,935	185	6.3
Area under potato (ha)	734	66	8.9	669	47	7.0
Area of irrigated land (ha)	5,380	202	3.8	8,023	538	6.7
Total paddy production(qtl)	15,091	8,051	5.3	21,817	19,670	9.0
Total maize production (qtl)	29,721	11,006	3.7	31,514	20,188	6.4
Total wheat production (qtl)	6,988	4,080	5.8	5,286	4,436	8.4
Total potato production (qtl)	9,341	8,500	5.8	8,659	6,328	8.4
Farm population	260,630	2,580	1.0	234,952	6,899	2.9
	District 51 Argha khanchi			**Total Western Hill**		
Total area of holdings (ha)	31,597	1,364	4.3	288,808	4,305	1.5
Area of temporari crops (ha)	16,135	1,135	3.5	194,170	5,359	1.5
Area under paddy (ha)	4,668	261	5.6	88,370	1,449	1.6
Area under maize(ha)	9,607	253	2.6	121,876	2,070	1.7
Area under wheat (ha)	6,723	271	4.0	28,319	560	2.0
Area under potato (ha)	844	80	9.5	8,834	400	4.5
Area of irrigated land (ha)	4,150	356	8.6	79,108	1,387	1.8
Total paddy production(qtl)	11,651	5,274	4.5	226,698	48,190	2.1
Total maize production (qtl)	22,550	5,976	2.7	290,430	45,873	1.6
Total wheat production (qtl)	11,199	4,427	4.0	50,390	10,715	2.1
Total potato production (qtl)	8,457	7,919	4.0	110,761	51,248	4.5
Farm population	191,914	3,248	1.7	2,302,160	13,743	0.6

Data item	Census estimate	Standard error	Relative standard error %	Census estimate	Standard error	Relative standard error %
	District 48 Nawalparasi			District 49 Rupendhi		
Total area of holdings (ha)	56,125	2,610	4.7	71,188	3,160	4.4
Area of temporari crops (ha)	50,641	3,537	3.6	65,796	4,857	3.9
Area under paddy (ha)	39,728	1,073	2.7	62,241	2,987	4.8
Area under maize(ha)	11,894	810	6.8	1,641	189	11.5
Area under wheat (ha)	13,282	711	5.4	33,181	1,485	4.5
Area under potato (ha)	1,114	72	6.4	2,345	110	4.7
Area of irrigated land (ha)	42,584	1,616	3.8	58,925	2,508	4.3
Total paddy production(qtl)	142,873	49,166	3.4	221,352	106,513	4.8
Total maize production (qtl)	36,506	29,011	7.9	5,418	6,029	11.1
Total wheat production (qtl)	29,558	17,500	5.9	105,054	53,234	5.1
Total potato production (qtl)	14,496	9,124	5.9	30,808	14,041	5.1
Farm population	550,912	9,880	1.8	636,299	9,249	1.5
	District 50 Kapilbastu			**Total Western Terai**		
Total area of holdings (ha)	64,578	2,608	4.0	191,891	4,858	2.5
Area of temporari crops (ha)	59,908	4,735	4.8	176,344	7,650	2.4
Area under paddy (ha)	54,494	2,559	4.7	156,462	4,077	2.6
Area under maize(ha)	787	99	12.5	14,323	838	5.8
Area under wheat (ha)	22,711	1,733	7.6	69,174	2,391	3.5
Area under potato (ha)	1,630	63	3.8	5,089	146	2.9
Area of irrigated land (ha)	28,068	1,445	5.1	129,577	3,315	2.6
Total paddy production(qtl)	150,858	98,401	6.5	515,083	153,118	3.0
Total maize production (qtl)	1,779	2,102	11.8	43,703	29,705	6.8
Total wheat production (qtl)	69,020	57,021	8.3	203,631	79,947	3.9
Total potato production (qtl)	21,618	9,603	8.3	66,921	19,304	2.9
Farm population	497,571	11,908	2.4	1,684,782	18,026	1.1

Data item	Census estimate	Standard error	Relative standard error %	Census estimate	Standard error	Relative standard error %
	District 62 Dolpa			District 63 Jumla		
Total area of holdings (ha)	3,733	195	5.2	7,011	573	8.2
Area of temporari crops (ha)	3,178	281	7.3	5,701	904	12.0
Area under paddy (ha)	120	19	15.6	1,228	126	10.3
Area under maize(ha)	829	64	7.8	746	82	11.0
Area under wheat (ha)	520	45	8.6	1,811	318	17.5
Area under potato (ha)	349	18	5.3	548	35	6.4
Area of irrigated land (ha)	826	201	24.4	1,536	127	8.3
Total paddy production(qtl)	225	286	12.8	3,096	3,141	10.1
Total maize production (qtl)	897	676	7.5	982	990	10.1
Total wheat production (qtl)	980	689	7.0	3,583	5,500	15.4
Total potato production (qtl)	3,485	1,822	7.0	5,424	3,571	15.4
Farm population	34,158	637	1.9	103,061	2,246	2.2
	District 64 Kalikot			District 65 Mugu		
Total area of holdings (ha)	14,701	1,942	13.2	6,219	319	5.1
Area of temporari crops (ha)	10,994	2,421	12.3	5,646	389	4.6
Area under paddy (ha)	3,688	619	16.8	1,395	75	5.4
Area under maize(ha)	3,986	487	12.2	325	34	10.5
Area under wheat (ha)	7,478	1,006	13.5	2,205	173	7.8
Area under potato (ha)	790	306	38.8	437	48	10.9
Area of irrigated land (ha)	5,495	1,271	23.1	951	45	4.8
Total paddy production(qtl)	7,255	10,571	14.6	2,758	2,247	8.1
Total maize production (qtl)	8,561	11,147	13.0	423	390	9.2
Total wheat production (qtl)	12,383	16,038	13.0	3,969	2,337	5.9
Total potato production (qtl)	10,079	40,008	13.0	4,312	4,692	5.9
Farm population	135,461	2,189	1.6	54,567	527	1.0
	District 66 Humla			**Total Mid-Western Mountain**		
Total area of holdings (ha)	5,232	318	6.1	36,896	2,084	5.6
Area of temporari crops (ha)	4,934	451	5.7	30,454	2,667	5.6
Area under paddy (ha)	808	90	11.2	7,239	643	8.9
Area under maize(ha)	329	20	6.2	6,214	500	8.0
Area under wheat (ha)	1,789	124	6.9	13,803	1,077	7.8
Area under potato (ha)	304	23	7.4	2,429	313	12.9
Area of irrigated land (ha)	797	117	14.7	9,605	1,299	13.5
Total paddy production(qtl)	1,412	1,664	11.8	14,746	11,381	7.7
Total maize production (qtl)	517	407	7.9	11,380	11,225	9.9
Total wheat production (qtl)	2,262	1,755	7.8	23,177	17,219	7.4
Total potato production (qtl)	3,059	2,086	7.8	26,359	40,535	15.4
Farm population	48,264	604	1.3	375,511	3,299	0.9

MID-WESTERN HILL

Data item	Census estimate	Standard error	Relative standard error %	Census estimate	Standard error	Relative standard error %
	District 52 Pyuthan			District 53 Rolpa		
Total area of holdings (ha)	25,812	1,506	5.8	24,853	829	3.3
Area of temporari crops (ha)	18,023	2,016	6.2	19,397	788	2.1
Area under paddy (ha)	5,401	322	6.0	2,762	239	8.7
Area under maize(ha)	10,478	563	5.4	15,434	442	2.9
Area under wheat (ha)	8,117	436	5.4	13,541	397	2.9
Area under potato (ha)	448	48	10.8	847	122	14.4
Area of irrigated land (ha)	7,417	477	6.4	3,534	357	10.1
Total paddy production(qtl)	13,374	5,876	4.4	6,407	6,972	10.9
Total maize production (qtl)	16,671	9,055	5.4	35,227	10,959	3.1
Total wheat production (qtl)	15,063	8,470	5.6	23,131	6,346	2.7
Total potato production (qtl)	5,844	6,363	5.6	11,032	15,419	2.7
Farm population	225,122	4,387	1.9	216,697	3,808	1.8
	District 54 Rukum			District 55 Salyan		
Total area of holdings (ha)	21,375	1,137	5.3	26,685	727	2.7
Area of temporari crops (ha)	15,238	1,404	4.9	19,699	1,275	3.4
Area under paddy (ha)	2,368	337	14.2	6,564	429	6.5
Area under maize(ha)	11,201	823	7.4	9,570	329	3.4
Area under wheat (ha)	9,577	517	5.4	13,838	364	2.6
Area under potato (ha)	584	63	10.7	862	111	12.9
Area of irrigated land (ha)	2,966	270	9.1	6,658	425	6.4
Total paddy production(qtl)	6,089	5,418	8.9	19,059	11,219	5.9
Total maize production (qtl)	17,709	12,436	7.0	24,994	7,095	2.8
Total wheat production (qtl)	22,183	12,615	5.7	26,044	7,920	3.0
Total potato production (qtl)	7,640	8,342	5.7	8,686	11,001	3.0
Farm population	203,095	2,229	1.1	233,982	4,355	1.9
	District 59 Surkhet			District 60 Dailekha		
Total area of holdings (ha)	27,241	1,350	5.0	21,329	791	3.7
Area of temporari crops (ha)	23,865	2,086	4.6	18,780	1,667	5.0
Area under paddy (ha)	11,345	229	2.0	6,952	300	4.3
Area under maize(ha)	10,829	754	7.0	10,893	631	5.8
Area under wheat (ha)	14,658	488	3.3	13,911	775	5.6
Area under potato (ha)	676	55	8.2	612	125	20.5
Area of irrigated land (ha)	11,372	611	5.4	5,336	265	5.0
Total paddy production(qtl)	33,449	10,554	3.2	18,651	7,998	4.3
Total maize production (qtl)	23,741	14,439	6.1	24,595	12,663	5.2
Total wheat production (qtl)	40,897	11,885	2.9	25,389	15,057	5.9
Total potato production (qtl)	12,473	10,883	2.9	8,016	16,113	5.9
Farm population	308,293	4,582	1.5	254,183	3,835	1.5

TABLE A3. 3: (continued) NATIONAL SAMPLE CENSUS OF AGRICULTURE, 2011/12
STANDARD ERRORS - DISTRICT
MID-WESTERN HILL (continued)

Data item	Census estimate	Standard error	Relative standard error %	Census estimate	Standard error	Relative standard error %
	District 61 Jajarkot			**Total Mid-Western Hill**		
Total area of holdings (ha)	16,127	539	3.3	163,423	2,742	1.7
Area of temporari crops (ha)	12,611	900	3.9	127,612	4,028	1.7
Area under paddy (ha)	3,715	225	6.1	39,108	807	2.1
Area under maize(ha)	5,720	280	4.9	74,125	1,531	2.1
Area under wheat (ha)	6,839	179	2.6	80,481	1,273	1.6
Area under potato (ha)	601	69	11.5	4,630	239	5.2
Area of irrigated land (ha)	2,132	145	6.8	39,416	1,036	2.6
Total paddy production(qtl)	8,354	5,797	6.9	105,383	21,150	2.0
Total maize production (qtl)	8,640	3,248	3.8	151,578	28,044	1.9
Total wheat production (qtl)	11,565	3,119	2.7	164,271	26,675	1.6
Total potato production (qtl)	7,797	8,915	2.7	61,487	30,437	5.0
Farm population	165,408	2,332	1.4	1,606,781	9,941	0.6

MID-WESTERN TERAI

Data item	Census estimate	Standard error	Relative standard error %	Census estimate	Standard error	Relative standard error %
	District 56 Dang			District 57 Banke		
Total area of holdings (ha)	61,951	2,441	4.0	44,120	1,372	3.1
Area of temporari crops (ha)	55,389	4,076	3.9	41,276	3,565	4.8
Area under paddy (ha)	33,782	1,355	4.0	33,052	1,417	4.3
Area under maize(ha)	20,226	704	3.5	4,610	460	10.0
Area under wheat (ha)	12,074	665	5.5	16,203	1,004	6.2
Area under potato (ha)	1,518	133	8.8	889	57	6.4
Area of irrigated land (ha)	43,151	1,092	2.5	22,405	984	4.4
Total paddy production(qtl)	117,178	45,989	3.9	96,799	49,916	5.2
Total maize production (qtl)	45,606	16,104	3.5	10,457	9,340	8.9
Total wheat production (qtl)	27,550	16,641	6.0	43,356	27,501	6.3
Total potato production (qtl)	19,581	17,114	6.0	11,715	6,866	6.3
Farm population	452,948	9,871	2.2	347,075	5,952	1.7
	District 58 Bardiya			**Total Mid-Western Terai**		
Total area of holdings (ha)	47,233	2,595	5.5	153,305	3,818	2.5
Area of temporari crops (ha)	44,229	5,350	6.2	140,894	7,612	2.9
Area under paddy (ha)	39,830	2,647	6.6	106,664	3,294	3.1
Area under maize(ha)	3,728	226	6.1	28,563	871	3.0
Area under wheat (ha)	17,034	1,321	7.8	45,311	1,788	3.9
Area under potato (ha)	1,710	178	10.4	4,117	229	5.6
Area of irrigated land (ha)	37,940	2,293	6.0	103,496	2,724	2.6
Total paddy production(qtl)	131,039	88,254	6.7	345,015	111,335	3.2
Total maize production (qtl)	8,208	4,663	5.7	64,271	19,192	3.0
Total wheat production (qtl)	47,271	39,685	8.4	118,177	51,070	4.3
Total potato production (qtl)	22,399	24,004	8.4	53,695	30,269	5.6
Farm population	375,857	5,190	1.4	1,175,880	12,641	1.1

Data item	Census estimate	Standard error	Relative standard error %	Census estimate	Standard error	Relative standard error %
		District 67 Bajura			District 68 Bajhang	
Total area of holdings (ha)	9,413	603	6.4	11,812	736	6.2
Area of temporari crops (ha)	7,341	657	5.1	10,013	1,366	7.2
Area under paddy (ha)	3,048	251	8.2	5,890	547	9.3
Area under maize(ha)	970	118	12.2	1,778	225	12.6
Area under wheat (ha)	4,884	319	6.5	7,367	719	9.8
Area under potato (ha)	418	43	10.3	925	132	14.3
Area of irrigated land (ha)	2,188	131	6.0	4,103	348	8.5
Total paddy production(qtl)	7,063	4,696	6.6	15,282	14,411	9.4
Total maize production (qtl)	2,322	2,375	10.2	2,345	2,398	10.2
Total wheat production (qtl)	8,810	4,863	5.5	14,439	12,994	9.0
Total potato production (qtl)	3,796	3,863	5.5	6,771	9,721	9.0
Farm population	131,795	1,650	1.3	193,372	5,731	3.0
		District 75 Darchula			**Total Far-Western Mountain**	
Total area of holdings (ha)	17,379	916	5.3	38,604	1,321	3.4
Area of temporari crops (ha)	12,053	1,168	5.2	29,407	1,913	3.5
Area under paddy (ha)	2,557	223	8.7	11,495	642	5.6
Area under maize(ha)	6,499	287	4.4	9,247	383	4.1
Area under wheat (ha)	7,866	365	4.6	20,117	867	4.3
Area under potato (ha)	356	51	14.2	1,699	148	8.7
Area of irrigated land (ha)	2,143	215	10.0	8,435	430	5.1
Total paddy production(qtl)	5,625	5,078	9.0	27,971	15,984	5.7
Total maize production (qtl)	14,603	7,581	5.2	19,270	8,298	4.3
Total wheat production (qtl)	14,026	9,045	6.4	37,275	16,562	4.4
Total potato production (qtl)	4,662	6,364	6.4	15,229	12,244	8.0
Farm population	131,029	3,754	2.9	456,195	7,047	1.5

Data item	Census estimate	Standard error	Relative standard error %	Census estimate	Standard error	Relative standard error %
	District 69 Achham			District 70 Doti		
Total area of holdings (ha)	18,489	1,349	7.3	16,382	751	4.6
Area of temporari crops (ha)	15,254	2,280	8.1	14,518	1,428	5.4
Area under paddy (ha)	6,904	451	6.5	8,469	370	4.4
Area under maize(ha)	5,190	710	13.7	1,538	198	12.9
Area under wheat (ha)	11,128	786	7.1	9,977	490	4.9
Area under potato (ha)	330	52	15.9	405	66	16.3
Area of irrigated land (ha)	5,197	341	6.6	6,633	400	6.0
Total paddy production(qtl)	16,643	6,779	4.1	19,777	9,275	4.7
Total maize production (qtl)	11,299	15,166	13.4	3,544	4,578	12.9
Total wheat production (qtl)	18,841	12,742	6.8	18,523	8,737	4.7
Total potato production (qtl)	3,253	5,157	6.8	5,262	8,641	4.7
Farm population	250,731	2,552	1.0	208,264	3,743	1.8
	District 73 Dadheldhura			District 74 Baitadi		
Total area of holdings (ha)	11,617	517	4.5	21,327	1,832	8.6
Area of temporari crops (ha)	9,882	871	4.6	13,103	2,391	9.4
Area under paddy (ha)	4,933	187	3.8	4,014	564	14.1
Area under maize(ha)	2,756	171	6.2	7,144	647	9.1
Area under wheat (ha)	6,225	434	7.0	10,806	1,053	9.7
Area under potato (ha)	493	44	8.9	481	114	23.6
Area of irrigated land (ha)	3,667	277	7.6	3,576	450	12.6
Total paddy production(qtl)	13,402	3,833	2.9	9,127	11,370	12.5
Total maize production (qtl)	4,447	2,265	5.1	12,388	10,872	8.8
Total wheat production (qtl)	11,663	7,577	6.5	19,254	16,586	8.6
Total potato production (qtl)	6,480	5,503	6.5	6,297	14,286	8.6
Farm population	140,189	2,179	1.6	246,347	3,539	1.4
	Total Far-Western Hill					
Total area of holdings (ha)	67,815	2,451	3.6			
Area of temporari crops (ha)	52,757	3,703	3.7			
Area under paddy (ha)	24,320	833	3.4			
Area under maize(ha)	16,628	995	6.0			
Area under wheat (ha)	38,136	1,468	3.8			
Area under potato (ha)	1,708	148	8.7			
Area of irrigated land (ha)	19,073	745	3.9			
Total paddy production(qtl)	58,949	16,612	2.8			
Total maize production (qtl)	31,678	19,347	6.1			
Total wheat production (qtl)	68,281	23,900	3.5			
Total potato production (qtl)	21,292	18,320	8.6			
Farm population	845,531	6,148	0.7			

TABLE A3. 3: (continued) NATIONAL SAMPLE CENSUS OF AGRICULTURE, 2011/12
STANDARD ERRORS - DISTRICT
FAR-WESTERN TERAI

Data item	Census estimate	Standard error	Relative standard error %	Census estimate	Standard error	Relative standard error %
	District 71 Kailali			District 72 Kanchanpur		
Total area of holdings (ha)	66,658	2,755	4.1	44,353	1,977	4.5
Area of temporari crops (ha)	62,035	5,410	4.5	41,454	3,726	4.7
Area under paddy (ha)	57,192	2,241	3.9	35,777	1,342	3.8
Area under maize(ha)	2,727	265	9.7	2,780	211	7.6
Area under wheat (ha)	37,253	2,099	5.6	29,722	1,328	4.5
Area under potato (ha)	2,423	79	3.3	1,159	35	3.0
Area of irrigated land (ha)	60,079	2,460	4.1	39,685	1,811	4.6
Total paddy production(qtl)	166,821	61,957	3.7	107,165	30,088	2.8
Total maize production (qtl)	6,565	6,878	10.5	6,160	4,645	7.5
Total wheat production (qtl)	86,954	52,152	6.0	61,598	32,667	5.3
Total potato production (qtl)	31,389	10,314	6.0	14,918	4,138	5.3
Farm population	679,451	9,842	1.4	411,793	7,137	1.7
Total Far-Western Terai						
Total area of holdings (ha)	111,011	3,391	3.1			
Area of temporari crops (ha)	103,489	6,569	3.3			
Area under paddy (ha)	92,968	2,612	2.8			
Area under maize(ha)	5,507	339	6.2			
Area under wheat (ha)	66,975	2,484	3.7			
Area under potato (ha)	3,582	86	2.4			
Area of irrigated land (ha)	99,764	3,055	3.1			
Total paddy production(qtl)	273,986	68,876	2.5			
Total maize production (qtl)	12,726	8,300	6.5			
Total wheat production (qtl)	148,552	61,538	4.1			
Total potato production (qtl)	46,306	11,113	2.4			
Farm population	1,091,245	12,158	1.1			

APPENDIX 4

SAMPLE DESIGN PARAMETERS

TABLE A4.1: NATIONAL SAMPLE CENSUS OF AGRICULTURE, 2011/12 - SAMPLE DESIGN PARAMETERS

APPENDIX 4
SAMPLE DESIGN PARAMETERS
TABLE A4.1 NATIONAL SAMPLE CENSUS OF AGRICULTURE, 2011/12 - SAMPLE DESIGN PARAMETERS

District Code	District	Area of holdings			Area under paddy			Area under maize		
		Cofficient of variation	Design effect	Measure of homogenit	Cofficient of variation	Design effect	Measure of homogenit	Cofficient of variation	Design effect	Measure of homogenit
	ESTERN MOUNTAIN									
1	Taplejung	1.05	3.80	0.13	0.80	3.90	0.28	0.95	6.51	0.25
9	Sankhuwasabha	0.77	0.96	0.00	0.83	2.94	0.13	1.04	5.06	0.19
11	Solukhumbu	0.88	9.10	0.35	0.97	2.64	0.21	1.09	6.58	0.26
	ESTERN HILL									
2	Panchthar	0.93	1.29	0.01	0.97	2.62	0.20	0.90	8.33	0.34
3	Ilam	0.87	5.08	0.18	0.85	1.68	0.06	0.93	3.02	0.10
7	Dhankuta	0.93	3.02	0.09	0.85	4.01	0.36	0.84	3.67	0.12
8	Terhathum	0.86	3.84	0.12	0.75	3.19	0.20	0.82	7.26	0.29
10	Bhojpur	0.82	6.48	0.24	0.82	3.62	0.20	0.80	4.62	0.16
12	Okhaldhunga	0.93	9.00	0.35	0.92	2.03	0.08	0.88	8.55	0.33
13	Khotang	0.86	1.28	0.01	0.94	2.76	0.13	0.88	4.26	0.14
14	Udayapur	0.94	0.59	0.02	1.05	2.42	0.09	0.98	2.14	0.06
	ESTERN TERAI									
4	Jhapa	1.07	3.70	0.13	0.99	2.27	0.08	1.08	1.40	0.03
5	Morang	1.27	2.71	0.08	1.08	2.43	0.09	1.09	2.13	0.12
6	Sunsari	1.33	5.91	0.25	0.97	2.48	0.09	1.72	2.59	0.27
15	Saptari	1.25	2.04	0.05	0.99	2.75	0.09	0.86	5.84	2.74
16	Siraha	1.02	2.01	0.05	1.00	1.50	0.03	0.88	3.43	0.41
	CENTRAL MOUNTAIN									
22	Dolakha	0.77	1.88	0.04	0.84	3.21	0.19	0.84	2.17	0.06
23	Sindhupalchok	0.81	5.96	0.22	0.88	10.66	0.55	0.86	3.20	0.10
29	Rasuwa	0.80	4.93	0.17	0.92	4.15	0.26	0.83	3.53	0.11
	CENTRAL HILL									
20	Sindhuli	0.86	3.69	0.12	0.85	2.96	0.12	0.81	6.96	0.27
21	Ramechhap	0.93	5.39	0.20	0.83	2.86	0.17	0.98	4.46	0.16
24	Kavrepalanchok	0.93	6.51	0.24	0.92	2.20	0.09	0.87	6.28	0.25
25	Lalitpur	1.34	8.33	0.34	0.82	2.52	0.11	1.39	12.19	0.67
26	Bhaktapur	0.88	3.76	0.13	0.89	4.00	0.16	1.32	2.30	0.11
27	Kathmandu	1.07	4.52	0.17	0.96	2.12	0.08	1.56	5.85	0.33
28	Nuwakot	0.74	8.10	0.30	1.00	7.69	0.37	0.81	6.32	0.24
30	Dhading	0.73	0.84	0.01	0.89	2.92	0.13	0.87	3.90	0.13
31	Makwanpur	1.05	4.54	0.16	1.16	0.93	0.01	1.18	4.53	0.17

District Code	District	Area of holdings			Area under paddy			Area under maize		
		Cofficient of variation	Design effect	Measure of homogenit	Cofficient of variation	Design effect	Measure of homogenit	Cofficient of variation	Design effect	Measure of homogenit
	CENTRAL TERAI									
17	Dhanusa	1.08	2.13	0.05	1.03	2.33	0.07	1.19	2.18	0.36
18	Mahottari	1.15	1.34	0.02	1.20	1.17	0.01	0.81	5.13	0.68
19	Sarlahi	1.18	1.97	0.05	1.11	1.07	0.00	1.38	2.84	0.24
32	Rautahat	1.24	1.74	0.03	1.29	1.49	0.02	1.56	3.01	0.35
33	Bara	1.17	1.88	0.04	1.17	1.60	0.03	1.07	3.22	0.27
34	Parsa	1.22	5.41	0.20	1.20	5.34	0.20	0.90	2.21	0.27
35	Chitawan	1.05	2.79	0.08	1.02	5.21	0.23	1.22	3.73	0.15
	WESTERN MOUNTAIN									
41	Manang									
42	Mustang	0.84	6.84	0.25	0.80	1.72	ONE OBSEVA	0.90	1.05	0.00
	WESTERN HILL									
36	Gorkha	0.74	5.97	0.22	0.83	4.68	0.23	0.85	6.77	0.26
37	Lamjung	0.78	4.06	0.13	0.77	1.71	0.04	0.82	6.05	0.23
38	Tanahu	0.84	2.74	0.08	0.87	2.54	0.13	0.95	6.02	0.25
39	Syangja	0.83	2.82	0.08	0.84	4.44	0.25	0.84	0.84	0.01
40	Kaski	0.96	5.74	0.21	0.84	4.83	0.27	0.97	5.50	0.23
43	Myagdi	0.83	6.99	0.25	0.75	4.24	0.23	0.91	10.03	0.40
44	Parbat	0.87	6.26	0.23	0.87	6.83	0.34	0.94	7.95	0.31
45	Baglung	0.95	9.08	0.35	0.83	3.37	0.21	0.92	8.17	0.33
46	Gulmi	0.99	2.94	0.08	0.89	2.05	0.10	0.90	2.67	0.07
47	Palpa	0.85	5.68	0.21	0.83	4.38	0.27	0.83	8.11	0.32
51	Arghakhanchi	0.87	3.57	0.11	0.89	2.25	0.15	0.86	1.29	0.01
	WESTERN TERAI									
48	Nawalparasi	1.39	2.39	0.06	1.02	1.27	0.01	1.07	4.55	0.25
49	Rupandehi	1.08	3.82	0.13	1.07	4.37	0.16	0.97	5.16	0.85
50	Kapilbastu	1.26	2.40	0.06	1.16	3.66	0.12	1.19	3.18	0.46
	MID-WESTERN MOUNTAIN									
62	Dolpa	0.77	6.04	0.20	0.94	3.28	0.65	0.87	8.40	0.32
63	Jumla	0.80	13.15	0.51	0.89	10.63	0.53	1.06	9.18	0.50
64	Kalikot	1.31	12.49	0.49	1.50	13.08	0.61	1.47	7.58	0.31
65	Mugu	0.61	8.72	0.32	0.77	4.44	0.18	1.11	5.72	0.38
66	Humla	0.68	10.15	0.37	1.00	8.60	0.48	0.93	2.66	0.12

District Code	District	Area of holdings			Area under paddy			Area under maize		
		Cofficient of variation	Design effect	Measure of homogenit	Cofficient of variation	Design effect	Measure of homogenit	Cofficient of variation	Design effect	Measure of homogenit
	MID-WESTERN HILL									
52	Pyuthan	0.98	5.03	0.17	1.01	2.35	0.13	1.00	3.97	0.13
53	Rolpa	0.87	2.01	0.04	0.97	2.66	0.26	0.76	1.89	0.04
54	Rukum	0.85	5.97	0.22	1.11	8.19	0.79	1.07	6.96	0.27
55	Salyan	0.77	2.07	0.05	0.95	4.60	0.26	0.89	2.40	0.06
59	Surkhet	0.92	5.11	0.17	0.88	0.64	0.02	1.08	6.32	0.26
60	Dailekh	0.98	2.17	0.05	0.87	2.70	0.10	0.88	6.41	0.24
61	Jajarkot	0.78	2.43	0.06	0.85	5.01	0.22	0.79	4.98	0.17
	MID-WESTERN TERAI									
56	Dang	0.98	3.40	0.11	0.90	2.59	0.12	1.07	1.98	0.05
57	Banke	1.05	1.74	0.03	0.97	3.21	0.11	1.58	3.03	0.23
58	Bardiya	1.14	4.57	0.16	1.10	6.13	0.27	1.71	0.92	0.01
	FAR-WESTERN MOUNTAIN									
67	Bajura	0.98	5.15	0.18	1.21	5.18	0.20	1.51	6.26	0.29
68	Bajhang	0.83	6.70	0.25	0.92	10.11	0.46	1.28	6.66	0.42
75	Darchula	0.74	6.26	0.22	0.83	8.24	0.47	0.85	3.05	0.09
	FAR-WESTERN HILL									
69	Achham	0.91	8.26	0.31	0.94	5.45	0.22	1.38	9.42	0.46
70	Doti	0.84	4.04	0.13	0.87	2.98	0.10	1.31	7.28	0.47
73	Dadeldhura	0.91	2.80	0.08	1.11	1.11	0.01	1.06	3.10	0.12
74	Baitadi	0.96	10.11	0.39	1.03	15.24	0.87	1.04	8.99	0.36
	FAR-WESTERN TERAI									
71	Kailali	1.28	2.54	0.07	1.30	1.98	0.05	1.44	3.72	0.38
72	Kanchanpur	1.05	3.73	0.12	1.03	2.56	0.07	1.39	2.54	0.16

APPENDIX 4
SAMPLE DESIGN PARAMETERS
TABLE A4.1 NATIONAL SAMPLE CENSUS OF AGRICULTURE, 2011/12 - SAMPLE DESIGN PARAMETERS

District Code	District	Area under wheat			Area under potato			Area under temporary crop		
		Cofficient of variation	Design effect	Measure of homogenit	Cofficient of variation	Design effect	Measure of homogenit	Cofficient of variation	Design effect	Measure of homogenit
	ESTERN MOUNTAIN									
1	Taplejung	1.01	5.68	0.72	1.78	17.79	1.12	0.90	8.12	0.32
9	Sankhuwasabha	0.78	4.25	0.51	1.08	11.66	0.96	0.74	2.83	0.08
11	Solukhumbu	1.04	7.44	0.44	1.17	10.40	0.45	0.99	10.26	0.40
	ESTERN HILL									
2	Panchthar	0.85	3.89	0.71	1.08	8.27	0.45	0.87	5.73	0.21
3	Ilam	0.99	4.14	0.64	1.31	16.82	0.90	0.90	3.76	0.12
7	Dhankuta	0.69	3.12	1.64	1.83	9.91	0.81	0.78	2.90	0.08
8	Terhathum	0.80	6.75	1.04	1.66	11.59	1.07	0.79	8.16	0.31
10	Bhojpur	0.94	3.20	0.55	1.60	13.30	1.05	0.69	5.87	0.21
12	Okhaldhunga	1.06	4.13	0.35	1.78	12.84	1.09	0.83	6.46	0.24
13	Khotang	0.90	2.98	0.27	2.11	11.07	0.83	0.80	1.56	0.02
14	Udayapur	0.86	2.09	0.29	1.31	2.68	0.21	0.94	0.50	0.02
	ESTERN TERAI									
4	Jhapa	0.90	2.07	0.29	1.27	3.68	0.21	1.03	4.84	0.19
5	Morang	1.26	3.85	0.33	1.44	1.76	0.07	1.31	2.87	0.09
6	Sunsari	0.98	2.39	0.13	2.82	1.31	0.05	1.24	4.53	0.18
15	Saptari	1.04	6.87	0.35	1.20	3.85	0.28	1.00	3.37	0.11
16	Siraha	0.93	1.24	0.02	1.12	2.49	0.26	1.02	3.14	0.11
	CENTRAL MOUNTAIN									
22	Dolakha	0.91	5.50	0.28	1.22	9.81	0.56	0.73	1.06	0.00
23	Sindhupalchok	0.91	6.03	0.47	1.07	6.31	0.57	0.75	6.36	0.24
29	Rasuwa	0.70	3.99	0.43	0.91	6.13	0.34	0.80	3.78	0.12
	CENTRAL HILL									
20	Sindhuli	0.81	3.48	0.41	1.39	5.31	0.55	0.77	3.00	0.09
21	Ramechhap	1.00	1.27	0.03	1.22	9.22	0.71	0.89	5.02	0.18
24	Kavrepalanchok	0.82	4.26	0.33	1.09	7.13	0.57	0.79	4.54	0.16
25	Lalitpur	0.82	3.20	0.20	1.27	1.06	0.01	1.11	7.49	0.30
26	Bhaktapur	0.91	3.62	0.17	1.47	6.17	0.63	0.90	4.06	0.15
27	Kathmandu	0.95	0.72	0.02	1.48	4.91	0.47	1.13	5.90	0.23
28	Nuwakot	0.81	2.94	0.18	1.19	7.07	0.68	0.73	7.07	0.26
30	Dhading	0.95	1.28	0.04	1.03	4.10	0.26	0.75	1.84	0.04
31	Makwanpur	0.84	2.62	0.60	1.13	5.77	0.91	1.06	4.98	0.18

District Code	District	Area under wheat			Area under potato			Area under temporary crop		
		Cofficient of variation	Design effect	Measure of homogenit	Cofficient of variation	Design effect	Measure of homogenit	Cofficient of variation	Design effect	Measure of homogenit
	CENTRAL TERAI									
17	Dhanusa	1.07	1.81	0.05	1.90	0.84	0.02	1.05	3.08	0.10
18	Mahottari	1.11	0.94	0.00	1.01	3.53	0.51	1.17	1.73	0.04
19	Sarlahi	0.89	2.33	0.11	2.26	0.85	0.05	1.19	1.87	0.04
32	Rautahat	1.28	0.84	0.01	0.97	2.87	0.43	1.24	1.48	0.02
33	Bara	1.13	2.81	0.10	1.84	7.48	1.26	1.16	1.46	0.02
34	Parsa	1.25	5.11	0.21	1.55	4.04	0.58	1.21	6.02	0.22
35	Chitawan	1.09	1.21	0.04	1.55	1.61	0.06	1.05	3.92	0.13
	WESTERN MOUNTAIN									
41	Manang									
42	Mustang	0.87	6.39	0.52	1.02	5.38	0.22	0.81	5.76	0.21
	WESTERN HILL									
36	Gorkha	0.68	6.43	1.32	0.95	8.38	0.80	0.75	7.28	0.28
37	Lamjung	0.94	1.72	0.33	1.83	9.60	1.12	0.71	2.91	0.08
38	Tanahu	0.97	3.42	1.17	1.02	3.08	0.57	0.83	3.65	0.12
39	Syangja	0.94	6.01	0.73	1.24	4.57	0.36	0.79	3.14	0.10
40	Kaski	0.82	2.79	0.37	1.25	6.24	0.48	0.86	4.68	0.17
43	Myagdi	0.89	2.08	0.08	1.17	8.56	0.68	0.82	9.79	0.37
44	Parbat	0.88	4.61	0.38	1.16	6.74	0.52	0.82	8.19	0.31
45	Baglung	0.85	2.66	0.12	1.68	8.92	0.70	0.82	7.62	0.29
46	Gulmi	0.90	2.57	0.15	1.12	3.83	0.31	0.89	3.43	0.10
47	Palpa	0.84	3.08	0.23	1.08	2.70	0.19	0.82	12.87	0.32
51	Arghakhanchi	0.90	2.32	0.07	1.29	4.76	0.28	0.92	2.12	0.05
	WESTERN TERAI									
48	Nawalparasi	1.27	1.86	0.07	1.13	3.31	0.22	1.04	2.54	0.07
49	Rupandehi	1.15	2.47	0.10	1.59	1.12	0.01	1.10	2.91	0.09
50	Kapilbastu	1.27	6.08	0.30	1.29	1.20	0.01	1.20	3.72	0.12
	MID-WESTERN MOUNTAIN									
62	Dolpa	0.94	6.31	0.30	0.85	4.38	0.16	0.80	11.08	0.40
63	Jumla	1.21	20.77	1.06	1.12	3.14	0.11	0.82	26.87	1.08
64	Kalikot	1.44	10.65	0.41	2.09	18.90	1.67	1.26	11.89	0.46
65	Mugu	0.74	11.27	0.53	1.25	6.34	0.34	0.61	6.98	0.25
66	Humla	0.93	5.61	0.24	1.14	2.70	0.14	0.73	7.81	0.12

District Code	District	Area under wheat			Area under potato			Area under temporary crop		
		Cofficient of variation	Design effect	Measure of homogenit	Cofficient of variation	Design effect	Measure of homogenit	Cofficient of variation	Design effect	Measure of homogenit
	MID-WESTERN HILL									
52	Pyuthan	0.99	3.11	0.12	1.49	2.26	0.16	0.97	5.73	0.20
53	Rolpa	0.88	1.42	0.02	1.07	5.70	0.65	0.76	1.05	0.04
54	Rukum	1.02	3.85	0.13	1.01	4.73	0.49	0.89	4.58	0.16
55	Salyan	0.84	1.54	0.02	1.04	9.39	0.98	0.78	3.06	0.06
59	Surkhet	0.92	1.92	0.05	1.15	3.33	0.26	0.90	4.59	0.15
60	Dailekh	0.88	6.02	0.22	1.59	7.18	0.72	0.83	5.42	0.19
61	Jajarkot	0.72	1.67	0.03	1.14	6.62	0.46	0.69	4.26	0.17
	MID-WESTERN TERAI									
56	Dang	0.93	3.42	0.24	1.31	5.08	0.34	1.03	2.99	0.09
57	Banke	1.07	3.97	0.22	1.31	2.06	0.10	1.08	3.92	0.13
58	Bardiya	1.13	4.99	0.34	1.58	5.92	0.32	1.17	5.51	0.20
	FAR-WESTERN MOUNTAIN									
67	Bajura	1.06	4.58	0.16	1.41	3.57	0.21	0.96	3.39	0.10
68	Bajhang	0.99	11.13	0.46	1.24	7.36	0.60	0.88	7.97	0.31
75	Darchula	0.82	3.84	0.12	1.48	4.14	0.34	0.77	5.67	0.09
	FAR-WESTERN HILL									
69	Achham	0.89	7.93	0.30	1.52	3.12	0.37	0.89	10.76	0.41
70	Doti	0.83	4.50	0.16	1.53	6.04	0.57	0.83	5.60	0.20
73	Dadeldhura	0.96	5.68	0.23	1.28	2.71	0.15	0.90	3.00	0.09
74	Baitadi	0.94	13.36	0.53	1.40	12.77	1.41	0.92	12.92	0.36
	FAR-WESTERN TERAI									
71	Kailali	1.30	3.31	0.14	1.15	1.55	0.03	1.33	2.76	0.08
72	Kanchanpur	0.98	3.79	0.14	1.15	0.97	0.00	1.06	4.08	0.14

APPENDIX 4
SAMPLE DESIGN PARAMETERS
TABLE A4.1 NATIONAL SAMPLE CENSUS OF AGRICULTURE, 2011/12 - SAMPLE DESIGN PARAMETERS

District Code	District	Number of cattle			Number of buffalo			Farm population		
		Cofficient of variation	Design effect	Measure of homogenit	Cofficient of variation	Design effect	Measure of homogenit	Cofficient of variation	Design effect	Measure of homogenit
	ESTERN MOUNTAIN									
1	Taplejung	1.02	3.64	0.15	0.54	2.49	0.20	0.40	2.82	0.08
9	Sankhuwasabha	0.70	9.54	0.47	0.59	1.91	0.13	0.39	2.78	0.08
11	Solukhumbu	0.54	4.22	0.19	0.56	2.38	0.12	0.43	4.30	0.14
	ESTERN HILL									
2	Panchthar	0.55	4.13	0.17	0.46	2.83	0.20	0.42	2.57	0.07
3	Ilam	0.50	6.51	0.27	0.51	1.64	0.13	0.38	5.03	0.18
7	Dhankuta	0.53	3.02	0.11	0.54	1.70	0.11	0.43	2.16	0.05
8	Terhathum	0.51	5.22	0.22	0.41	1.50	0.06	0.44	1.87	0.04
10	Bhojpur	0.52	3.40	0.12	0.46	1.91	0.08	0.43	1.67	0.03
12	Okhaldhunga	0.61	1.25	0.01	0.52	1.72	0.04	0.40	2.40	0.06
13	Khotang	0.59	1.62	0.03	0.51	2.30	0.09	0.40	2.47	0.06
14	Udayapur	0.60	3.64	0.16	0.72	2.26	0.16	0.42	2.14	0.05
	ESTERN TERAI									
4	Jhapa	0.58	1.89	0.05	0.49	1.05	0.01	0.39	1.51	0.02
5	Morang	0.58	3.49	0.16	0.47	1.91	0.19	0.39	1.11	0.01
6	Sunsari	0.56	1.09	0.01	0.52	2.25	0.29	0.43	3.69	0.12
15	Saptari	0.57	4.73	0.20	0.70	2.53	0.19	0.43	0.98	0.00
16	Siraha	0.55	3.97	0.20	0.46	1.86	0.10	0.46	2.24	0.05
	CENTRAL MOUNTAIN									
22	Dolakha	0.52	2.24	0.10	0.50	3.66	0.25	0.44	3.91	0.13
23	Sindhupalchok	0.61	2.76	0.16	0.48	1.76	0.06	0.43	1.70	0.03
29	Rasuwa	0.95	2.46	0.15	0.52	1.72	0.04	0.45	6.42	0.23
	CENTRAL HILL									
20	Sindhuli	0.60	3.25	0.13	0.51	3.64	0.21	0.42	4.34	0.14
21	Ramechhap	0.51	5.00	0.27	0.44	2.60	0.10	0.47	5.71	0.21
24	Kavrepalanchok	0.50	0.53	-0.04	0.51	2.17	0.10	0.44	4.75	0.16
25	Lalitpur	0.57	2.73	0.26	0.50	6.75	0.55	0.36	1.90	0.04
26	Bhaktapur	2.56	0.67	-0.04	0.50	4.05	1.92	0.42	2.75	0.08
27	Kathmandu	0.76	1.61	0.08	0.51	1.05	0.01	0.42	3.99	0.13
28	Nuwakot	0.54	4.47	0.29	0.52	0.55	-0.03	0.44	0.67	0.01
30	Dhading	0.55	6.46	0.39	0.48	2.19	0.08	0.41	2.69	0.08
31	Makwanpur	0.61	2.31	0.09	0.46	1.26	0.04	0.43	0.96	0.00

District Code	District	Number of cattle			Number of buffalo			Farm population		
		Cofficient of variation	Design effect	Measure of homogenit	Cofficient of variation	Design effect	Measure of homogenit	Cofficient of variation	Design effect	Measure of homogenit
	CENTRAL TERAI									
17	Dhanusa	0.71	3.22	0.17	0.44	0.93	-0.01	0.46	1.28	0.01
18	Mahottari	0.54	5.75	0.43	0.43	1.22	0.03	0.43	4.95	0.18
19	Sarlahi	0.54	2.82	0.17	0.50	2.95	0.20	0.46	2.62	0.07
32	Rautahat	0.71	1.85	0.14	0.56	2.07	0.12	0.48	2.97	0.09
33	Bara	0.64	1.81	0.13	0.48	1.04	0.00	0.48	3.31	0.09
34	Parsa	0.62	2.06	0.25	0.52	2.12	0.16	0.50	3.82	0.12
35	Chitawan	0.68	2.41	0.20	0.52	1.03	0.00	0.43	2.86	0.08
	WESTERN MOUNTAIN									
41	Manang	#VALUE!	#VALUE!	#VALUE!						
42	Mustang	0.64	5.85	0.27	1.66	19.89	5.25	0.47	1.85	0.04
	WESTERN HILL									
36	Gorkha	0.74	5.36	0.36	0.61	3.39	0.16	0.45	2.77	0.08
37	Lamjung	0.80	1.71	0.08	0.65	4.30	0.24	0.44	2.69	0.07
38	Tanahu	0.70	7.19	0.51	0.50	2.87	0.15	0.50	3.24	0.10
39	Syangja	0.71	3.91	0.35	0.52	4.90	0.20	0.46	2.99	0.09
40	Kaski	1.10	1.41	0.06	0.55	1.85	0.06	0.44	0.68	0.01
43	Myagdi	1.06	3.39	0.20	0.56	1.31	0.02	0.44	1.61	0.03
44	Parbat	0.69	6.05	0.44	0.56	2.29	0.07	0.48	3.34	0.10
45	Baglung	0.90	4.20	0.34	0.52	4.99	0.22	0.45	4.00	0.13
46	Gulmi	0.57	1.55	0.07	0.45	2.22	0.06	0.45	0.79	0.01
47	Palpa	0.64	3.56	0.22	0.49	3.73	0.17	0.46	6.22	0.32
51	Arghakhanchi	0.73	3.00	0.19	0.46	0.88	-0.01	0.39	2.69	0.07
	WESTERN TERAI									
48	Nawalparasi	0.76	1.41	0.06	0.96	2.06	0.11	0.48	3.07	0.09
49	Rupandehi	0.75	1.23	0.02	0.62	2.23	0.16	0.53	1.75	0.03
50	Kapilbastu	0.49	3.50	0.19	0.60	1.14	0.02	0.55	4.42	0.14
	MID-WESTERN MOUNTAIN									
62	Dolpa	0.75	8.94	0.38	0.56	3.07	0.97	0.44	2.41	0.06
63	Jumla	0.59	1.27	0.01	0.38	3.90	1.08	0.40	3.80	0.12
64	Kalikot	0.55	4.33	0.16	0.53	1.40	0.03	0.41	1.90	0.04
65	Mugu	0.61	5.11	0.19	0.48	1.81	0.12	0.37	0.83	0.01
66	Humla	0.65	7.08	0.30	0.73	0.89	-0.02	0.40	1.25	0.12

District Code	District	Number of cattle			Number of buffalo			Farm population		
		Cofficient of variation	Design effect	Measure of homogenit	Cofficient of variation	Design effect	Measure of homogenit	Cofficient of variation	Design effect	Measure of homogenit
	MID-WESTERN HILL									
52	Pyuthan	0.65	2.04	0.08	0.50	0.68	-0.02	0.45	2.62	0.07
53	Rolpa	0.58	6.26	0.27	0.51	5.01	0.39	0.41	2.55	0.04
54	Rukum	0.70	2.11	0.07	0.62	3.11	0.16	0.35	1.46	0.02
55	Salyan	0.58	2.07	0.05	0.54	1.79	0.08	0.38	3.96	0.06
59	Surkhet	0.56	9.70	0.47	0.47	2.68	0.28	0.43	2.11	0.05
60	Dailekh	0.63	4.56	0.18	0.52	2.17	0.09	0.39	2.35	0.06
61	Jajarkot	0.56	2.46	0.07	0.55	3.22	0.15	0.37	1.94	0.17
	MID-WESTERN TERAI									
56	Dang	0.75	2.33	0.10	0.75	5.93	0.80	0.46	4.78	0.17
57	Banke	0.90	2.07	0.10	0.79	3.63	0.37	0.50	2.33	0.06
58	Bardiya	0.54	0.54	-0.05	0.56	1.89	0.12	0.50	1.54	0.02
	FAR-WESTERN MOUNTAIN									
67	Bajura	0.60	8.93	0.37	0.58	1.44	0.04	0.36	1.43	0.02
68	Bajhang	0.47	4.05	0.14	0.53	2.40	0.15	0.37	7.80	0.30
75	Darchula	0.51	5.31	0.19	0.53	2.46	0.10	0.42	5.77	0.09
	FAR-WESTERN HILL									
69	Achham	0.63	6.31	0.25	0.56	4.32	0.25	0.40	0.83	0.01
70	Doti	0.55	4.06	0.14	0.53	1.88	0.16	0.44	2.30	0.06
73	Dadeldhura	0.51	3.00	0.10	0.53	2.11	0.11	0.44	1.45	0.02
74	Baitadi	0.44	3.38	0.11	0.52	5.65	0.29	0.35	2.13	0.36
	FAR-WESTERN TERAI									
71	Kailali	0.63	4.10	0.20	0.49	1.87	0.15	0.48	2.32	0.06
72	Kanchanpur	0.50	3.12	0.12	0.50	1.12	0.01	0.47	2.90	0.08

APPENDIX 5

AGRICULTURAL CENSUS, 2011/12
COMPARISONS WITH 2011 POPULATION CENSUS

TABLE A5.1: FARM POPULATION BY REGION, COMPARISON BETWEEN POPULATION AND AGRICULTURAL CENSUSES

TABLE A5.2: FARM HOUSEHOLD SIZE BY REGION, COMPARISON BETWEEN POPULATION AND AGRICULTURAL CENSUSES

TABLE A5.3: FARM POPULATION AND FARM HOUSEHOLD SIZE BY DISTRICT, COMPARISON BETWEEN POPULATION AND AGRICULTURAL CENSUSES

TABLE A5.4: AGE COMPOSITION OF FARM AND TOTAL POPULATION, NEPAL, COMPARISON BETWEEN POPULATION AND AGRICULTURAL CENSUSES

TABLE A5.5: GENDER COMPOSITION OF FARM AND TOTAL POPULATION BY AGE, NEPAL, COMPARISON BETWEEN POPULATION AND AGRICULTURAL CENSUSES

TABLE A5.6: AGE COMPOSITION OF FARM AND TOTAL POPULATION, NEPAL, COMPARISON BETWEEN POPULATION AND AGRICULTURAL CENSUSES

TABLE A5.1: FARM POPULATION BY REGION, COMPARISON BETWEEN POPULATION AND AGRICULTURAL CENSUSES

	Farm population ('000)	
	Agricultural Census,2011/12	Population Census,2011
Nepal	20,552.5	20,206.4
Ecological belt		
Mountain	1,695.5	1,669.9
Hill	8,615.0	8,404.1
Terai	10,242.0	10,132.3
Development region		
Eastern	4,635.0	4,493.1
Central	6,366.8	6,350.2
Western	3,999.6	3,944.3
Mid-western	3,158.2	3,081.6
Far-western	2,393.0	2,337.2

TABLE A5.2: FARM HOUSEHOLD SIZE BY REGION, COMPARISON BETWEEN POPULATION AND AGRICULTURAL CENSUSES

	Average farm household size	
	Agricultural Census,2011/12	Population Census,2011
Nepal	5.4	5.3
Ecological belt		
Mountain	5.2	5.1
Hill	5.0	4.9
Terai	5.8	5.7
Development region		
Eastern	5.2	5.0
Central	5.5	5.5
Western	5.0	4.9
Mid-western	5.5	5.4
Far-western	5.8	5.7

TABLE A5.3: FARM POPULATION AND FARM HOUSEHOLD SIZE BY DISTRICT, COMPARISON BETWEEN POPULATION AND AGRICULTURAL CENSUSES

	Agricultural Census,2011/12		Population Census,2011	
	Population ('000)	Average h'hold size	Population ('000)	Average h'hold size
EASTERN MOUNTAIN				
Taplejung	112.0	4.8	116.9	5.0
Sankhuwasabha	148.4	5.0	144.0	4.8
Solukhumbu	99.4	4.6	98.9	4.6
EASTERN HILL				
Panchthar	179.2	4.9	176.9	4.8
Ilam	272.4	4.7	268.3	4.6
Dhankuta	150.5	4.8	143.5	4.6
Terhathum	95.8	4.9	93.6	4.8
Bhojpur	177.8	4.8	176.8	4.8
Okhaldhunga	145.2	4.8	140.3	4.6
Khotang	199.7	4.9	198.9	4.9
Udayapur	300.3	5.5	275.4	5.0
EASTERN TERAI				
Jhapa	593.0	4.9	574.6	4.8
Morang	647.9	5.1	616.2	4.9
Sunsari	474.5	5.5	455.8	5.3
Saptari	517.1	5.8	506.4	5.7
Siraha	521.8	5.9	506.5	5.7
CENTRAL MOUNTAIN				
Dolakha	174.8	4.3	172.2	4.2
Sindhupalchok	275.1	4.7	264.6	4.5
Rasuwa	41.5	4.9	39.5	4.6
CENTRAL HILL				
Sindhuli	292.2	5.7	274.5	5.4
Ramechhap	192.0	4.7	195.2	4.8
Kavre	328.7	4.8	334.4	4.9
Lalitpur	170.7	5.1	165.7	4.9
Bhaktapur	157.0	5.1	155.1	5.1
Kathmandu	265.0	5.1	256.4	5.0
Nuwakot	264.5	4.9	267.8	5.0
Dhading	320.4	5.0	305.3	4.7
Makwanpur	349.1	5.2	346.5	5.2

	Agricultural Census,2011/12		Population Census,2011	
	Population ('000)	Average h'hold size	Population ('000)	Average h'hold size
CENTRAL TERAI				
Dhanusa	571.7	6.0	569.3	5.9
Mahottari	486.0	6.0	485.9	6.0
Sarlahi	628.2	6.4	606.6	6.2
Rautahat	506.9	6.4	541.7	6.8
Bara	536.0	6.6	550.2	6.8
Parsa	392.8	6.6	406.8	6.8
Chitawan	414.2	4.7	412.6	4.7
WESTERN MOUNTAIN				
Manang	3.5	3.5	4.9	4.7
Mustang	9.1	3.8	9.5	3.9
WESTERN HILL				
Gorkha	241.9	4.2	244.5	4.2
Lamjung	142.5	4.3	137.6	4.2
Tanahu	268.2	4.5	260.0	4.4
Syangja	253.3	4.4	255.9	4.4
Kaski	234.0	4.4	227.2	4.3
Myagdi	97.7	4.3	96.3	4.3
Parbat	131.4	4.6	123.7	4.3
Baglung	245.7	4.8	234.7	4.5
Gulmi	260.6	4.5	258.2	4.5
Palpa	235.0	4.8	225.2	4.6
Arghakhanchi	191.9	4.4	187.9	4.3
WESTERN TERAI				
Nawalparasi	550.9	5.4	544.3	5.4
Rupandehi	636.3	6.1	636.5	6.1
Kapilbastu	497.6	6.7	497.8	6.7
MID-WESTERN MOUNTAIN				
Dolpa	34.2	5.1	34.2	5.1
Jumla	103.1	5.8	103.6	5.8
Kalikot	135.5	6.3	132.9	6.2
Mugu	54.6	5.9	54.5	5.9
Humla	48.3	5.8	47.6	5.7

	Agricultural Census,2011/12		Population Census,2011	
	Population ('000)	Average h'hold size	Population ('000)	Average h'hold size
MID-WESTERN HILL				
Pyuthan	225.1	5.1	217.2	4.9
Rolpa	216.7	5.4	211.4	5.2
Rukum	203.1	5.4	194.0	5.1
Salyan	234.0	5.5	228.5	5.3
Surkhet	308.3	5.4	286.0	5.1
Dailekh	254.2	5.6	248.4	5.5
Jajarkot	165.4	5.8	164.0	5.7
MID-WESTERN TERAI				
Dang	452.9	5.2	443.9	5.1
Banke	347.1	5.6	344.0	5.6
Bardiya	375.9	5.5	371.5	5.5
FAR-WESTERN MOUNTAIN				
Bajura	131.8	5.8	128.4	5.7
Bajhang	193.4	6.0	192.1	5.9
Darchula	131.0	5.8	126.1	5.6
FAR-WESTERN HILL				
Achham	250.7	5.6	246.6	5.5
Doti	208.3	5.7	196.6	5.3
Dadeldhura	140.2	5.7	135.8	5.5
Baitadi	246.3	5.7	249.8	5.7
FAR-WESTERN TERAI				
Kailali	679.5	6.1	655.2	5.9
Kanchanpur	411.8	5.8	406.7	5.8

TABLE A5.4: AGE COMPOSITION OF FARM AND TOTAL POPULATION, NEPAL, COMPARISON BETWEEN POPULATION AND AGRICULTURAL CENSUSES

	Farm population 2011/12*		Total population 2011#	
	Number ('000)	Percent	Number ('000)	Percent
All ages	20552.5	100.0	26494.5	100.0
Under 15 years	6648.0	32.3	9248.2	34.9
15 - 24 years	4314.5	21.0	5290.1	20.0
25 - 34 years	2907.6	14.1	3814.7	14.4
35 - 44 years	2485.2	12.1	2990.4	11.3
45 - 54 years	1896.8	9.2	2178.4	8.2
55 - 64 years	1288.6	6.3	1575.1	5.9
65 years and over	1011.8	4.9	1397.6	5.3

* Agricultural Census,201/12

Population Census,2011

TABLE A5.5: GENDER COMPOSITION OF FARM AND TOTAL POPULATION BY AGE , NEPAL, COMPARISON BETWEEN POPULATION AND AGRICULTURAL CENSUSES

Age group	Males per 100 females	
	Farm population 2011/12*	Total population 2011#
All ages	100.8	94.2
Under 15 years	106.5	104.0
15 - 24 years	98.3	88.7
25 - 34 years	89.0	79.4
35 - 44 years	92.8	88.1
45 - 54 years	103.5	98.5
55 - 64 years	109.3	98.4
65 years and over	118.0	99.3

* Agricultural Census,201/12

Population Census,2011

TABLE A5.6: AGE COMPOSITION OF FARM AND TOTAL POPULATION, NEPAL, COMPARISON BETWEEN POPULATION AND AGRICULTURAL CENSUSES

	Farm population 2011/12*			Total population 2011#		
	Male ('000)	Female ('000)	Sex ratio	Male ('000)	Female ('000)	Sex ratio
EASTERN MOUNTAIN						
Taplejung	55,289	56,687	97.5	60,552	66,909	90.5
Sankhuwasabha	74,909	73,540	101.9	75,225	83,517	90.1
Solukhumbu	49,552	49,823	99.5	51,200	54,686	93.6
EASTERN HILL						
Panchthar	89,760	89,464	100.3	90,186	101,631	88.7
Ilam	136,847	135,531	101.0	141,126	149,128	94.6
Dhankuta	72,553	77,975	93.0	76,515	86,897	88.1
Terhathum	47,596	48,196	98.8	47,151	54,426	86.6
Bhojpur	87,799	90,046	97.5	86,053	96,406	89.3
Okhaldhunga	71,088	74,069	96.0	68,687	79,297	86.6
Khotang	99,514	100,173	99.3	97,092	109,220	88.9
Udayapur	149,938	150,315	99.7	149,712	167,820	89.2
EASTERN TERAI						
Jhapa	296,358	296,659	99.9	385,096	427,554	90.1
Morang	329,679	318,181	103.6	466,712	498,658	93.6
Sunsari	241,440	233,088	103.6	371,229	392,258	94.6
Saptari	271,355	245,776	110.4	313,846	325,438	96.4
Siraha	266,452	255,339	104.4	310,101	327,227	94.8
CENTRAL MOUNTAIN						
Dolakha	84,007	90,770	92.5	87,003	99,554	87.4
Sindhupalchok	135,966	139,139	97.7	138,351	149,447	92.6
Rasuwa	21,316	20,204	105.5	21,475	21,825	98.4
CENTRAL HILL						
Sindhuli	148,227	144,009	102.9	142,123	154,069	92.2
Ramechhap	95,607	96,422	99.2	93,386	109,260	85.5
Kavre	159,161	169,540	93.9	182,936	199,001	91.9
Lalitpur	83,876	86,855	96.6	238,082	230,050	103.5
Bhaktapur	80,163	76,883	104.3	154,884	149,767	103.4
Kathmandu	133,793	131,161	102.0	913,001	831,239	109.8
Nuwakot	137,824	126,674	108.8	132,787	144,684	91.8
Dhading	158,570	161,821	98.0	157,834	178,233	88.6
Makwanpur	172,969	176,093	98.2	206,684	213,793	96.7

	Farm population 2011/12*			Total population 2011#		
	Male ('000)	Female ('000)	Sex ratio	Male ('000)	Female ('000)	Sex ratio
CENTRAL TERAI						
Dhanusa	301,954	269,737	111.9	378,538	376,239	100.6
Mahottari	260,208	225,793	115.2	311,016	316,564	98.2
Sarlahi	335,727	292,430	114.8	389,756	379,973	102.6
Rautahat	267,064	239,812	111.4	351,079	335,643	104.6
Bara	285,969	249,999	114.4	351,244	336,464	104.4
Parsa	205,842	187,004	110.1	312,358	288,659	108.2
Chitawan	196,867	217,380	90.6	279,087	300,897	92.8
WESTERN MOUNTAIN						
Manang	1,663	1,825	91.1	3,661	2,877	127.3
Mustang	4,375	4,767	91.8	7,093	6,359	111.5
WESTERN HILL						
Gorkha	110,294	131,574	83.8	121,041	150,020	80.7
Lamjung	67,879	74,585	91.0	75,913	91,811	82.7
Tanahu	123,783	144,443	85.7	143,410	179,878	79.7
Syangja	112,822	140,441	80.3	125,833	163,315	77.0
Kaski	109,245	124,797	87.5	236,385	255,713	92.4
Myagdi	46,601	51,051	91.3	51,395	62,246	82.6
Parbat	64,664	66,742	96.9	65,301	81,289	80.3
Baglung	109,963	135,780	81.0	117,997	150,616	78.3
Gulmi	118,517	142,113	83.4	120,995	159,165	76.0
Palpa	111,041	123,911	89.6	115,840	145,340	79.7
Arghakhanchi	92,366	99,548	92.8	86,266	111,366	77.5
WESTERN TERAI						
Nawalparasi	276,526	274,387	100.8	303,675	339,833	89.4
Rupandehi	319,410	316,889	100.8	432,193	448,003	96.5
Kapilbastu	259,009	238,562	108.6	285,599	286,337	99.7
MID-WESTERN MOUNTAIN						
Dolpa	17,008	17,151	99.2	18,238	18,462	98.8
Jumla	52,256	50,805	102.9	54,898	54,023	101.6
Kalikot	69,046	66,414	104.0	68,833	68,115	101.1
Mugu	27,507	27,059	101.7	28,025	27,261	102.8
Humla	25,392	22,872	111.0	25,833	25,025	103.2

	Farm population 2011/12*			Total population 2011#		
	Male ('000)	Female ('000)	Sex ratio	Male ('000)	Female ('000)	Sex ratio
MID-WESTERN HILL						
Pyuthan	104,259	120,863	86.3	100,053	128,049	78.1
Rolpa	110,499	106,198	104.1	103,100	121,406	84.9
Rukum	103,319	99,776	103.6	99,159	109,408	90.6
Salyan	120,659	113,323	106.5	115,969	126,475	91.7
Surkhet	154,322	153,970	100.2	169,421	181,383	93.4
Dailekh	130,326	123,857	105.2	126,990	134,780	94.2
Jajarkot	86,216	79,192	108.9	85,537	85,767	99.7
MID-WESTERN TERAI						
Dang	219,362	233,586	93.9	261,059	291,524	89.5
Banke	176,981	170,094	104.0	244,255	247,058	98.9
Bardiya	187,725	188,132	99.8	205,080	221,496	92.6
FAR-WESTERN MOUNTAIN						
Bajura	65,589	66,206	99.1	65,806	69,106	95.2
Bajhang	101,441	91,930	110.3	92,794	102,365	90.7
Darchula	65,951	65,078	101.3	63,605	69,669	91.3
FAR-WESTERN HILL						
Achham	126,323	124,408	101.5	120,008	137,469	87.3
Doti	102,887	105,377	97.6	97,252	114,494	84.9
Dadeldhura	72,154	68,035	106.1	66,556	75,538	88.1
Baitadi	121,158	125,189	96.8	117,407	133,491	88.0
FAR-WESTERN TERAI						
Kanchanpur	205,175	206,618	99.3	216,042	235,206	91.9
Kailali	338,724	340,727	99.4	378,417	397,292	95.2

* Farm population 2011/12
# Total population 2011
Sex ratio: Number of males per 100 females.

APPENDIX 6

AGRICULTURAL CENSUS, 2011/12
COMPARISONS WITH CURRENT AGRICULTURAL STATISTICS

TABLE A6.1: AREA UNDER PADDY, MAIZE AND WHEAT BY REGION, COMPARISON BETWEEN GRICULTURAL CENSUS AND OTHER SOURCE, 2011/12

TABLE A6.2: NUMBER OF CATTLE, BUFFALOES AND GOATS BY REGION, COMPARISON BETWEEN GRICULTURAL CENSUS AND OTHER SOURCE, 2011/12

TABLE A6.3: SELECTED CHARACTERISTICS (CROPS) BY DISTRICT, COMPARISON BETWEEN AGRICULTURAL CENSUS AND OTHER SOURCE, 2011/12

TABLE A6.3a: SELECTED CHARACTERISTICS (LIVESTOCK) BY DISTRICT, COMPARISON BETWEEN AGRICULTURAL CENSUS AND OTHER SOURCE, 2011/12

TABLE A6.1: AREA UNDER PADDY, MAIZE AND WHEAT BY REGION, COMPARISON BETWEEN GRICULTURAL CENSUS AND OTHER SOURCE, 2011/12

| | Area ('000 hectares) | | | | | |
| | Paddy | | Maize | | Wheat | |
	Census 2011/12	Other source	Census 2011/12	Other source	Census 2011/12	Other source
Nepal	1456.0	1531.5	673.7	871.4	749.4	757.8
Ecological belt						
Mountain	61.7	68.1	74.2	98.7	56.7	44.5
Hill	309.5	395.5	453.1	617.7	185.9	267.5
Terai	1084.8	1068.0	146.4	155.0	506.8	445.9
Development region						
Eastern	482.1	470.7	190.5	250.6	157.7	110.4
Central	447.3	410.3	206.5	211.8	229.4	228.6
Western	244.8	312.7	136.4	214.0	97.3	134.4
Mid-western	153.0	177.3	108.9	146.1	139.7	149.9
Far-western	128.8	160.5	31.4	49.0	125.3	134.4

Other source: Ministry of Agriculture Development, 2011/12 data.

TABLE A6.2: NUMBER OF CATTLE, BUFFALOES AND GOATS BY REGION, COMPARISON BETWEEN GRICULTURAL CENSUS AND OTHER SOURCE, 2011/12

| | Number of livestock ('000) | | | | | |
| | Cattle | | Buffaloes | | Goats | |
	Census 2011/12	Other source	Census 2011/12	Other source	Census 2011/12	Other source
Nepal	6430.4	7244.944	3174.4	5133.139	10990.1	9512.958
Ecological belt						
Mountain	866.5	862.901	272.0	435.312	1185.2	1245.302
Hill	3123.7	3473.927	1745.6	2697.788	6152.7	4813.59
Terai	2440.2	2908.116	1156.8	2000.039	3652.2	3454.066
Development region						
Eastern	1890.3	2089.32	560.6	1196.776	2536.6	2531.361
Central	1241.6	1711.425	908.8	1346.564	3368.2	2611.795
Western	895.8	1202.147	932.7	1294.419	2164.7	1782.614
Mid-western	1338.5	1304.21	439.7	765.463	1890.1	1693.281
Far-western	1064.2	937.842	332.6	529.917	1030.5	893.907

Other source: Ministry of Agriculture Development, 2011/12 data.

TABLE A6.3: SELECTED CHARACTERISTICS (CROPS) BY DISTRICT, COMPARISON BETWEEN AGRICULTURAL CENSUS AND OTHER SOURCE, 2011/12

District	Area ('000 hectares)					
	Paddy		Maize		Wheat	
	Census 2011/12	Other source	Census 2011/12	Other source	Census 2011/12	Other source
EASTERN MOUNTAIN						
Taplejung	5.4	10.5	9.8	16.1	1.8	1.2
Sankhuwasabha	14.1	15.8	10.1	13.1	2.1	1.5
Solukhumbu	1.5	1.6	5.5	13.0	2.8	3.8
EASTERN HILL						
Panchthar	5.6	11.5	12.3	12.8	1.0	4.0
Ilam	13.9	14.8	18.9	31.5	1.9	4.6
Dhankuta	5.4	8.9	12.1	18.2	0.3	1.4
Terhathum	6.3	10.7	9.6	12.4	0.8	2.8
Bhojpur	11.9	16.1	13.2	24.8	0.7	2.5
Okhaldhunga	4.7	6.6	13.8	12.4	2.7	2.4
Khotang	9.9	15.2	18.1	25.0	2.4	5.5
Udayapur	16.6	16.9	17.4	16.9	1.6	5.1
EASTERN TERAI						
Jhapa	93.6	89.4	29.0	24.6	6.4	7.5
Morang	100.9	78.2	12.9	15.1	37.3	16.9
Sunsari	59.2	53.6	5.1	7.8	30.4	17.5
Saptari	66.7	60.0	0.4	4.0	34.5	18.0
Siraha	66.1	61.0	2.2	3.1	30.8	15.7
CENTRAL MOUNTAIN						
Dolakha	6.8	3.1	11.6	8.5	9.2	4.4
Sindhupalchok	14.2	12.3	19.0	24.9	6.4	7.0
Rasuwa	0.9	1.3	2.5	2.4	0.3	0.7
CENTRAL HILL						
Sindhuli	13.5	10.3	17.3	15.5	2.0	5.6
Ramechhap	5.6	9.4	17.8	20.0	3.8	4.5
Kavre	10.1	10.1	19.7	24.3	4.9	10.0
Lalitpur	2.3	4.6	3.9	10.8	1.7	4.1
Bhaktapur	3.3	4.3	1.4	2.0	2.4	3.2
Kathmandu	5.1	8.0	2.5	7.1	3.5	4.7
Nuwakot	19.9	14.6	18.2	19.6	5.4	5.5
Dhading	15.1	14.8	20.4	15.3	2.6	4.8
Makwanpur	8.3	11.1	23.8	23.6	1.3	4.2

District	Area ('000 hectares)					
	Paddy		Maize		Wheat	
	Census 2011/12	Other source	Census 2011/12	Other source	Census 2011/12	Other source
CENTRAL TERAI						
Dhanusa	60.2	65.0	1.1	2.0	35.6	38.5
Mahottari	46.7	34.8	2.7	2.4	24.7	26.8
Sarlahi	52.1	39.4	8.0	10.1	28.2	28.0
Rautahat	49.8	40.7	5.1	1.7	28.2	15.6
Bara	52.2	52.7	9.3	7.5	30.5	29.0
Parsa	44.6	44.4	1.9	4.1	33.6	23.6
Chitawan	36.6	29.7	20.4	10.0	5.1	8.8
WESTERN MOUNTAIN						
Manang	0.0	0.0	0.1	0.2	0.1	0.3
Mustang	0.0	0.0	0.1	0.5	0.1	0.6
WESTERN HILL						
Gorkha	13.1	12.1	17.5	17.0	0.9	4.1
Lamjung	10.2	15.6	7.9	15.9	0.2	0.6
Tanahu	10.4	13.2	16.3	22.2	0.5	1.9
Syangja	9.1	17.0	12.0	26.5	2.3	5.8
Kaski	12.4	22.5	7.1	14.0	0.9	7.1
Myagdi	3.5	3.9	6.5	11.1	2.6	3.0
Parbat	5.2	8.8	5.8	14.0	1.5	2.9
Baglung	4.8	5.9	12.1	20.3	5.6	7.0
Gulmi	6.6	10.0	13.2	24.0	4.0	8.1
Palpa	8.6	8.8	13.9	20.2	2.9	6.2
Arghakhanchi	4.7	8.2	9.6	16.5	6.7	7.3
WESTERN TERAI						
Nawalparasi	39.7	44.9	11.9	8.4	13.3	18.8
Rupandehi	62.2	70.5	1.6	2.3	33.2	30.5
Kapilbastu	54.5	71.5	0.8	0.8	22.7	30.0
MID-WESTERN MOUNTAIN						
Dolpa	0.1	0.3	0.8	2.4	0.5	0.3
Jumla	1.2	3.0	0.7	4.5	1.8	3.0
Kalikot	3.7	3.5	4.0	2.5	7.5	3.5
Mugu	1.4	1.3	0.3	0.6	2.2	1.3
Humla	0.8	0.6	0.3	0.1	1.8	0.6

District	Area ('000 hectares)					
	Paddy		Maize		Wheat	
	Census 2011/12	Other source	Census 2011/12	Other source	Census 2011/12	Other source
MID-WESTERN HILL						
Pyuthan	5.4	6.5	10.5	12.1	8.1	8.7
Rolpa	2.8	4.7	15.4	11.7	13.5	8.9
Rukum	2.4	3.6	11.2	16.8	9.6	11.8
Salyan	6.6	7.0	9.6	11.6	13.8	15.1
Surkhet	11.3	14.6	10.8	16.1	14.7	16.3
Dailekh	7.0	8.5	10.9	20.2	13.9	14.7
Jajarkot	3.7	3.5	5.7	8.4	6.8	11.8
MID-WESTERN TERAI						
Dang	33.8	38.3	20.2	25.2	12.1	12.7
Banke	33.1	36.5	4.6	8.5	16.2	17.9
Bardiya	39.8	45.5	3.7	5.5	17.0	23.5
FAR-WESTERN MOUNTAIN						
Bajura	3.0	3.3	1.0	0.8	4.9	5.0
Bajhang	5.9	7.0	1.8	3.7	7.4	6.2
Darchula	2.6	4.5	6.5	5.5	7.9	5.3
FAR-WESTERN HILL						
Achham	6.9	11.6	5.2	6.4	11.1	16.1
Doti	8.5	9.8	1.5	2.4	10.0	16.2
Dadeldhura	4.9	6.2	2.8	3.7	6.2	7.5
Baitadi	4.0	6.0	7.1	14.5	10.8	11.6
FAR-WESTERN TERAI						
Kailali	57.2	65.5	2.7	6.0	37.3	34.5
Kanchanpur	35.8	46.7	2.8	6.0	29.7	32.3

Other source: Ministry of Agriculture Development, 2011/12 data.

TABLE A6.3a: SELECTED CHARACTERISTICS (LIVESTOCK) BY DISTRICT,
COMPARISON BETWEEN AGRICULTURAL CENSUS AND OTHER SOURCE, 2011/12

| District | Number of livestock ('000) | | | | | |
| | Cattle | | Buffaloes | | Goats | |
	Census 2011/12	Other source	Census 2011/12	Other source	Census 2011/12	Other source
EASTERN MOUNTAIN						
Taplejung	50.2	73.2	16.0	45.8	77.9	143.3
Sankhuwasabha	77.7	128.7	17.1	55.6	124.7	183.1
Solukhumbu	53.3	47.0	21.1	49.7	43.5	96.2
EASTERN HILL						
Panchthar	70.8	110.3	24.9	50.2	121.3	170.4
Ilam	142.1	88.6	19.3	30.7	155.6	140.1
Dhankuta	80.7	79.9	15.4	28.0	165.8	143.3
Terhathum	44.0	83.5	14.8	71.2	87.8	108.9
Bhojpur	99.5	97.7	35.8	40.1	139.1	91.4
Okhaldhunga	70.8	60.0	49.3	61.0	118.4	116.4
Khotang	95.8	94.6	53.0	61.3	152.8	105.7
Udayapur	130.0	130.2	37.6	101.3	267.8	216.3
EASTERN TERAI						
Jhapa	247.2	328.0	59.9	135.3	273.9	228.2
Morang	256.3	273.3	52.0	148.6	310.2	240.3
Sunsari	183.2	225.1	39.3	110.7	181.3	190.6
Saptari	173.1	162.4	48.0	105.4	184.0	175.0
Siraha	115.5	106.7	56.9	101.9	132.5	182.1
CENTRAL MOUNTAIN						
Dolakha	61.0	79.2	38.4	50.6	194.0	145.8
Sindhupalchok	73.8	79.3	63.2	81.8	248.9	157.6
Rasuwa	14.4	25.5	10.1	18.3	25.1	33.3
CENTRAL HILL						
Sindhuli	133.1	119.6	57.0	62.0	264.0	181.5
Ramechhap	65.0	89.8	53.0	75.2	196.7	122.6
Kavre	71.6	138.8	66.3	151.0	280.0	294.7
Lalitpur	14.6	23.9	15.0	30.7	53.9	84.6
Bhaktapur	11.9	21.4	2.8	8.2	29.4	25.0
Kathmandu	22.1	43.7	6.9	29.9	64.3	42.9
Nuwakot	67.4	153.7	73.5	116.0	212.9	142.4
Dhading	108.4	133.3	84.0	108.9	316.6	142.8
Makwanpur	117.1	107.0	41.6	102.0	342.5	179.4

District	Number of livestock ('000)					
	Cattle		Buffaloes		Goats	
	Census 2011/12	Other source	Census 2011/12	Other source	Census 2011/12	Other source
CENTRAL TERAI						
Dhanusa	99.9	90.7	51.4	69.0	126.6	182.2
Mahottari	82.9	87.4	45.9	65.2	144.1	133.4
Sarlahi	93.0	115.0	80.3	69.4	218.3	170.7
Rautahat	52.1	119.2	53.4	72.2	147.1	135.7
Bara	48.4	112.8	54.8	76.0	160.6	145.0
Parsa	32.9	80.6	34.0	44.6	104.7	104.1
Chitawan	71.9	90.8	77.0	115.6	238.4	188.1
WESTERN MOUNTAIN						
Manang	2.5		0.0		6.0	
Mustang	7.1		0.2		27.5	
WESTERN HILL						
Gorkha	93.1	102.2	69.2	83.9	253.4	124.9
Lamjung	38.0	32.3	43.5	58.1	124.8	95.4
Tanahu	94.3	89.1	67.7	111.3	265.9	163.1
Syangja	48.3	91.7	94.0	144.5	164.2	179.1
Kaski	35.1	70.3	65.1	118.7	99.4	97.5
Myagdi	35.6	78.5	28.4	48.9	36.5	46.2
Parbat	22.0	55.3	39.1	50.8	57.1	40.0
Baglung	49.6	59.6	78.2	90.2	93.4	86.4
Gulmi	52.3	46.9	96.4	63.7	143.0	81.0
Palpa	76.8	92.4	67.7	97.6	207.0	141.6
Arghakhanchi	50.3	49.1	62.6	96.0	130.1	86.0
WESTERN TERAI						
Nawalparasi	96.1	182.0	83.8	117.2	270.4	216.3
Rupandehi	98.4	107.5	79.2	114.0	178.9	214.1
Kapilbastu	96.2	132.7	57.6	99.5	107.1	178.1
MID-WESTERN MOUMTAIN						
Dolpa	18.9	22.9	1.0	2.8	29.8	65.6
Jumla	64.8	70.9	2.5	3.9	47.0	77.4
Kalikot	66.1	33.3	19.7	18.3	56.3	46.6
Mugu	35.2	34.5	5.1	7.3	39.8	34.9
Humla	25.7	33.3	2.5	2.0	42.8	32.4

District	Number of livestock ('000)					
	Cattle		Buffaloes		Goats	
	Census 2011/12	Other source	Census 2011/12	Other source	Census 2011/12	Other source
MID-WESTERN HILL						
Pyuthan	87.6	97.1	55.3	67.7	158.5	106.5
Rolpa	142.6	101.8	36.5	46.5	166.1	109.4
Rukum	83.6	58.9	41.4	49.7	98.4	107.7
Salyan	126.1	142.2	21.5	76.4	202.4	141.4
Surkhet	139.3	141.9	25.0	56.3	229.8	214.7
Dailekh	107.2	126.9	39.6	68.4	162.3	130.1
Jajarkot	96.0	70.6	28.1	37.1	122.8	97.3
MID-WESTERN TERAI						
Dang	191.7	129.0	58.1	103.4	261.3	215.5
Banke	76.1	121.5	45.6	115.0	119.5	137.9
Bardiya	77.7	119.3	58.1	110.8	153.6	175.9
FAR-WESTERN MOUMTAIN						
Bajura	85.5	77.5	21.6	30.2	71.6	63.6
Bajhang	135.9	89.6	29.1	43.1	80.0	64.8
Darchula	94.4	55.4	24.3	26.0	70.4	67.7
FAR-WESTERN HILL						
Achham	94.0	102.7	39.3	60.1	130.3	105.2
Doti	110.0	122.4	18.0	45.3	121.8	123.7
Dadeldhura	80.2	65.0	22.4	39.7	91.7	119.8
Baitadi	116.7	101.0	56.2	59.2	125.0	108.3
FAR-WESTERN TERAI						
Kailali	196.5	170.2	62.7	128.2	229.5	130.2
Kanchanpur	151.1	154.0	58.8	98.2	110.4	110.8

Other source: Ministry of Agriculture Development, 2011/12 data.

APPENDIX 7

AGRICULTURAL CENSUS, 2011/12
COMPARISONS BETWEEN 2001/02 AND 2011/12 AGRICULTURAL CENSUSES

TABLE A7.1: NUMBER AND AREA OF HOLDINGS BY REGION, 2001/02 AND 2011/12

TABLE A7.2: NUMBER OF PARCELS AND FARM POPULATION BY REGION, 2001/02
AND 2011/12

TABLE A7.3: HOLDINGS GROWING PADDY AND AREA UNDER PADDY BY
REGION, 2001/02 AND 2011/12

TABLE A7.1: NUMBER AND AREA OF HOLDINGS BY REGION, 2001/02 AND 2011/12

Region	Number of holdings ('000)		Area of holdings ('000 ha.)	
	Census 2011/12	Census 2001/02	Census 2011/12	Census 2001/02
Nepal	3831.1	3364.1	2525.6	2654.0
Ecological belt				
Mountain	327.5	298.2	213.9	218.7
Hill	1729.7	1586.4	986.1	1038.6
Terai	1773.9	1479.5	1325.6	1396.7
Development region				
Eastern	894.9	810.0	755.2	795.5
Central	1153.9	1035.7	726.9	750.2
Western	797.3	715.8	482.6	512.2
Mid-western	575.1	469.5	353.6	370.7
Far-western	409.9	333.0	217.4	225.4

TABLE A7.2: NUMBER OF PARCELS AND FARM POPULATION BY REGION, 2001/02 AND 2011/12

Region	Number of parcels ('000)		Farm population('000)	
	Census 2011/12	Census 2001/02	Census 2011/12	Census 2001/02
Nepal	12096.4	10987.4	20,552.5	19811.6
Ecological belt				
Mountain	1550.2	1203.3	1,695.5	1595.2
Hill	5538.5	5048.7	8,615.0	8922.9
Terai	5007.7	4735.5	10,242.0	9293.5
Development region				
Eastern	2278.7	2218.4	4,635.0	2561.5
Central	3486.6	3374.2	6,366.8	6238.4
Western	2857.0	2772.5	3,999.6	4201.5
Mid-western	1939.1	1505.6	3,158.2	2749.5
Far-western	1526.0	1116.6	2,393.0	4060.7

TABLE A7.3: HOLDINGS GROWING PADDY AND AREA UNDER PADDY BY REGION, 2001/02 AND 2011/12

Region	Holding with paddy ('000)		Area under paddy ('000 ha.)	
	Census 2011/12	Census 2001/02*	Census 2011/12	Census 2001/02
Nepal	2954.8	2334.8	1456.0	1544.6
Ecological belt				
Mountain	238.7	187.6	61.7	74.2
Hill	1154.7	943.1	309.5	353.0
Terai	1561.3	1204.0	1084.8	1117.4
Development region				
Eastern	658.9	540.5	482.0	500.5
Central	942.8	739.2	447.3	471.0
Western	594.5	491.1	244.8	270.6
Mid-western	381.8	292.7	153.0	164.1
Far-western	376.8	271.3	128.8	138.4

* Holding with maim paddy only.