

## NEPAL 2001/02 METHODOLOGY

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#### I. INTRODUCTION

The 2001/02 National Census of Agriculture of Nepal (2001/02 NCA) conducted by the Central Bureau of Statistics is the most recent census of agriculture in HMG, Nepal. The first census in this country was conducted in 1961/62. Since then the Census of Agriculture has been conducted decennially: 1971/72, 1981/82 and 1991/92.

The 2001/02 NCA was undertaken in two phases. The first phase involved the complete enumeration of all agricultural holdings in the country including the area of the holding and livestock number. The enumeration of all the holdings was an integral activity of the first phase of the Census of Population 2001, which undertook the listing operation from May 14-28, 2001. Some questions on agricultural activities were asked to identify the agricultural holding. The second phase of the 2001/02 NCA was the selection and enumeration of sample holdings to widen the scope of the census from January to June 2002. Data on agricultural crops gathered refer to calendar year 2001 while the livestock and poultry population refers at the time of enumeration, from January to June 2002.

##### A. Objectives of the National Census of Agriculture of Nepal, 2001/02.

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The main objective of the census of agriculture of Nepal is to publish data at district level on the following:

1. Structure and characteristics of the holding such as size, agricultural land use, land tenure, land fragmentation, area planted to crops, number of livestock, and others;
2. To provide benchmark data for improving the reliability of estimates from current agricultural survey; and,
3. To provide basic data for national, ecological belts and development regions levels for national as well as sub-national policy, planning and decision making purposes.

##### B. Scope and Coverage of the 2001/02 NCA

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The scope of the 2001/02 NCA is almost the same as that in 1991/92 National Sample Census of Agriculture which adopted most of the recommendations of the Food and Agriculture Organization (FAO) in the collection of data under the following main headings:

1. **Identification.** - Holding and holder identification.
2. **Holder characteristics.** - Age and sex of holder; legal status of the holding; use of produce from holding; whether received agricultural loan and the source.
3. **Demographic and other characteristics.** - Age and sex of household members. Characteristics of the farm population were gathered in the Census of Population 2001 but will be included in the NCA 2001/02 analysis of results.

**4. Employment.** - For agricultural labour: permanent workers by sex and employment of occasional workers. Economic activities of the members of the household of the holder were not taken in the agriculture census because these were already covered in the Census of Population 2001 but will be included in the analysis of results of the 2001/02 NCA.

**5. Land and water.** - For holding as a whole: number of parcels; area; type of land; irrigated land, source of irrigation; etc. For each parcel: area; type of land; type of soil, color of soil; irrigated; area rented from others; whether rented out land; land use (whether arable, land under temporary crops, temporary meadow, temporary fallow; land under permanent crops; permanent meadows and pasture; pond; woodland/forest; and land not elsewhere classified) land tenure; and part of holding made uncultivable due to flooding and/or soil erosion during the reference year.

**6. Crops.** - Temporary crops: name of crops grown and area harvested on each parcel. Permanent crops: name of crops grown for each parcel; number of trees of productive and non-productive ages in compact plantations; and number of scattered trees. Use of agricultural inputs for major crops: type of seed; fertilizers, organic and inorganic: area and quantity of inorganic (chemical) fertilizer used; pesticides; use of irrigation and high yielding varieties of seeds; cropping patterns for each parcel, whether pure stand, mixed crop, or associated crop.

**7. Livestock.** - Animal numbers by type according to age and sex; poultry numbers: chicken classified by sex and for female, whether laying eggs or not.

**8. Machinery and equipment.** - Use of items of agricultural machinery and equipment; number of items; and source (owned by holder, common, landlord, or others).

**9. Buildings and other structures.** - Whether non-residential buildings used for agricultural purposes; tenure and type of these buildings.

**10. Ancillary activities on the holding.** - Existence of forest trees and fisheries on the holding; number of forest trees; type and area of fishing installation.

In terms of coverage, the agricultural census covered the whole of Nepal including urban areas. However, only agricultural holdings operated by households were included. Agricultural activities undertaken by government organizations, businesses like corporations and other juridical persons were not covered by the NCA.

The total area of the holding was reported in the district where the holder resides, regardless of the physical location of the parcels comprising the holding. Although in Nepal a holding is usually equivalent to the household and it is very rare where a household operates a holding where some parcels are located in other districts.

There are some VDCs (Village Development Committees) that were not covered by the listing operations or census enumeration during the Census of Population 2001 involving 12 districts. However, some estimates of the number of households and population were prepared by the Population Division based on the census listing or some independent sources of information, in the absence of the listing of households. The 12 districts are: Jhapa and Siraha districts both in Eastern Tarai; Surkhet and Salyan districts in Mid-Western Hill; Sindhupalchok and Dolakha districts in Central Mountain; Sinduli district in Central Hill; Dolpa, Jumla, Kalitkot, and Mugu districts all in MidWestern Mountain; and Bajura district in Far-Western Mountain.

## II. CENSUS METHODOLOGY

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### A. Complete Enumeration of Holdings, Area and Livestock

The census methodology in undertaking the 2001/02 National Census of Agriculture of Nepal is a combination of complete enumeration and sampling.

As mentioned earlier, the Census of Agriculture was implemented in two phases. The first phase was the complete enumeration of all holdings, their area and the number of livestock and poultry raised by all households in the country as an integral activity in the listing operations of the Census of Population 2001. Two questions were asked concerning agricultural activities of households, namely: total area of the agriculture holding and total number of livestock/poultry kept by the households. All households listed in the Population Census 2001 that possessed the characteristics of the holding as defined in the agriculture census were identified as agricultural holdings. These holdings and their corresponding areas and number of livestock kept including their household population were compiled by ward for all the 75 districts of Nepal from which the sampling frame was constructed.

## **B. Sampling Design**

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A two-stage stratified sampling was employed in the selection of the samples for enumeration to obtain the characteristics of the holdings for the 2001/02 NCA. This design is similar to that of the 1991/92 sampling design, which is a self-weighting sample.

### **Construction of the sampling frame.**

The listing of the wards in each district with the summarized data of the number of holdings and area was used to form enumeration areas (EA's). However, wards containing less than 30 holdings were combined to form one EA. The EAs in each district were stratified according to the number of holdings enumerated, arranged from the highest to the lowest.

### **Selection of samples**

The first stage of sample selection involved the primary sampling units (PSUs), where sample enumeration areas (EAs) were selected with probability proportional to size (PPS). The measure of size is the number of holdings enumerated in the EAs during the Census of Population 2001 listing operations.

To measure the importance of each district, the total area under 8 major crops was determined (paddy, wheat, maize, millet, barley, sugarcane, oilseed and potato). Districts were stratified into four groups according to this criterion. Group I represented the 10 least important districts; Group II, the next 15 important districts and Group III, the next 25 important districts and Group IV, the 25 most important districts. The number of selected EAs per district in each group follows:

Group I - 50 EAs per district (total of 450 EAs because one district, specifically Manang district was taken as a certainty sample district)

Group II - 60 EAs per district (total of 900 EAs)

Group III - 70 EAs per district (total of 1,750 EAs)

Group IV- 80 EAs per district (total of 2000 EAs).

The second stage of sample selection involved the selection of sample holdings systematically in each sample EA. Before the sample selection was done, a listing of holdings in each sample PSU was conducted to update the listing during the Population Census. The target number of holdings for enumeration in each sample EA was 25.

The Census of Agriculture sample was designed to be self-weighting within each district, i.e. all holdings within a district have the same chance of being included in the sample.

Approximately 5,100 enumeration areas were selected in the 74 districts and about 125,000 agricultural holdings were selected for enumeration. One district was completely covered in the second phase of the census of agriculture because of the few number of enumeration areas and holdings. This is the district of Manang.

The detailed stratification scheme done on the districts, the sampling procedures and the estimation of parameters for each district are found in the technical report, which is one of the series of reports prepared for the 2001/02 NCA.

### III. CONCEPTS AND DEFINITION OF TERMS

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The following concepts and definition of terms were adopted in the conduct of the 2001/02 NCA. In general, these concepts and definition of terms are in accordance with the recommendations of the Food and Agriculture Organization (FAO) in its "Programme for the World Census of Agriculture 2000."

**Holding.** For purposes of the census, an agricultural holding is defined as an economic unit of agricultural production under single management comprising all livestock and poultry kept and all land used wholly or partly for agricultural production purposes. A holding was considered to be an agricultural unit of production if it satisfies any of the following conditions:

- 1) having an area under crops of at least a quarter of ropani (or four annas) or one matomuri in Hill or Mountain districts (0.01272 hectares) or at least eight dhur (0.01355 hectares) in Tarai; or,
- 2) keeping at least two heads of cattle or buffaloes; or,
- 3) keeping at least five heads of sheep or goats; or,
- 4) keeping at least 20 heads of poultry; or,
- 5) keeping any combination of livestock and poultry equivalent to 2 animal units, 1 animal unit is equal to 1 big livestock, i.e. cattle or buffalo; 3 heads of sheep or goats; or 10 heads of poultry, e.g. 1 cattle and 10 chicken or 1 buffalo and 2 goats and 1 sheep.

**Holder.** The holder is the person in the holding who exercises management control over the operations of the holding. There is only one holder in each holding. The holder may or may not be the same person as the household head.

**Household.** A household is a group of persons who live in the same dwelling and have common arrangements for the provision of food and other essentials of daily living. A household may comprise one or more persons and may include unrelated persons (e.g. farm workers). More than one household may live in a single house.

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

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

**Dry land.** This land refers to any land other than wetland, i.e. land that is not suitable for paddy cultivation.

**Land tenure.** This refers to arrangements or rights under which the holder operates the land of a holding. A holding may be operated under one or more tenure forms. For purposes of the Census of Agriculture, there are three forms of land tenure, namely: (1) land owned by the holding; (2) land rented from others; and land under other tenure forms.

**Land owned** is the land operated by the holding for which the holder possesses title of ownership. It also includes land which the holder can reasonably expect to eventually possess title of ownership, e.g. inherited land, and land which has been operated for many years by the same holder without any other claims being made on the land (owner-like possession). Land owned but rented out to others is not included under owned

since it is not part of the holding.

Land rented from others. This is land rented or leased by the holder from other persons. Land rented is divided into a number of categories according to the basis which the land was rented:

- rented for a fixed amount of money;
- rented for a fixed quantity of the produce;
- rented for a fixed share of the produce;
- rented in exchange for services provided, e.g. labour;
- rented as part of a mortgage arrangement; and,
- other rental arrangements, e.g. rent-free where no payment is given for the use of the land.

Other tenure forms. These refer to land operated under tenure conditions other than ownership or renting from others. Squatter land and land under dispute are included under this category.

Land use. This refers to the major classification of the use of the land on the holding. For purposes of the agricultural census, land operated by the holding is classified according to the following land use categories:

1) Agricultural land

- Crop land
- Arable land
- Land under permanent crops
- Land under permanent meadows and pastures
- Ponds

2) Woodland or forest

3) All other land in the holding

Arable land. This land refers to all land generally under cultivation and is divided into: land under temporary crops; Land under temporary meadows; land under temporary fallow; and other arable land.

Land under temporary crops refers to land used during the reference year in raising crops whose growing cycle is less than one year.

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

Land under temporary fallow refers to land that was not cultivated for at least one year to let the land rest to restore its fertility. The land must not rest for 5 years, otherwise it will be classified under permanent meadows and pasture.

Other arable land includes land normally used for temporary crops but which the holding was unable to cultivate during the reference year because of flooding, landslides or other factors.

Land under permanent crops. This land refers to land cultivated with perennial crops that do not require replanting for several years after each harvest.

Land under permanent meadows and pastures. This land refers to land that has been used permanently for 5 years or more in growing forage crops.

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

Woodland or forest. This land refers to woodlots or timber tracts, natural or planted, constituting part of the holding which have or will have value as wood, timber, other forest products or for soil erosion protection.

Other land in the holding. This covers two categories: 1) Unused and undeveloped potentially productive land refers to land that is not being cultivated and which would require some development before it could be brought into crop production; and, 2) Land in holding not elsewhere specified which includes land occupied by buildings, roads, ornamental gardens and other open spaces on the holding.

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

Drainage is the removal of excess water from the land surface and/or the upper soil layer to enable the land to be cultivated or to improve the productivity of the land.

Area under temporary crops refers to the area for temporary crops sown for harvest during the census year 2001.

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

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

Associated crops are temporary and permanent crops cultivated simultaneously in the same field. The total area of each individual crop in associated crop land is equal to the area of the land.

Compact plantation of permanent crops refers to plants, trees and shrubs planted in a regular and systematic manner.

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

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

Scattered trees refer to trees planted in scattered or isolated manner throughout the holding. Only the number of trees is reported and not the area.

Fertilizers refer to anything added to the soil to increase the amount of plant nutrients to promote crop growth. For census purposes, there are two types of fertilizers- organic and inorganic

Organic fertilizers are organic substances such as farmyard manure, compost, etc.

Inorganic fertilizers are chemical or commercial fertilizers.

Pesticides/insecticides refer mainly to insecticides but also fungicides, fumigants, herbicides, rodenticides, and other similar substances.

Improved seeds refer to high yielding variety seeds used on the holding during the reference year.

Local seeds refer to native or ordinary varieties used on the holding during the reference year.

Livestock refers to domesticated animals and fowls kept by the holding on the day of enumeration. This includes livestock owned by the holding and livestock being leased in by the holding. Livestock, in its generic sense, includes poultry.

Agricultural implements. Use of specified items of agricultural equipment refers to the use of the equipment for agricultural purposes on the holding during the reference year, regardless of ownership of the equipment. Equipment not used for agricultural purposes is excluded.

Non-residential buildings refer to the use of non-residential buildings on the holding for agricultural purposes during the reference year. Non-residential buildings were classified by tenure and by use. A building used both for residential and non-residential purposes is considered residential and therefore excluded.

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

Fisheries. The information on whether the holding has fisheries on the holding refers to whether any fish were taken from ponds or paddy fields on the holding during the reference year.

Agricultural credit refers to whether, on the day of enumeration, the holding owed money or any loan which had been received for agricultural purposes, regardless of when the loan had been taken out.

Hired manager is a person who takes responsibility for the management of a holding on a holder's behalf.

Permanent agricultural workers are workers employed permanently by the holding during the reference year. By permanent is meant that the person worked on the holding for six months or more during the reference year. In mountain areas, a permanent worker was anyone considered permanent by the holder. Permanent workers exclude any members of the holder's household (even if the person is unrelated and being paid work on the holding).

Occasional agricultural workers are workers employed by the holding who are not considered to be permanent. Occasional workers include only those who work for payment in cash or in goods - work done in exchange for labour was not included.

Farm population consists of all household members of all households listed during the Population Census as having agriculture land holding and/or raised livestock or poultry.

Economically active farm population refers to members of the household of agricultural holdings who are at least 10 years old who reported as having engaged in any economic activity during the reference year or seeking work at any time during the reference year.

Not economically active farm population refers to members of the household of the agricultural holding who are at least 10 years old who have no economic activity.

Activity status refers to what an individual was doing most of the time during the past twelve months whether working in agriculture/own farm, salary/wage work, working in own economic enterprise, doing extended economic activity, doing household chores, going to school or no work at all

Labour force participation rate of farm population is the ratio of the farm population 10 years old and over who were either employed or seeking work during the reference period to the total farm population. The ratio is multiplied by 100 to express it in percent.

Male labour force participation rate is the ratio of male population 10 years old and over who are either employed or seeking work to the total male population multiplied by 100.

Female labour force participation rate is the ratio of female population 10 years old and over who are either employed or seeking work to the total female population multiplied by 100.

SEE ALSO AGRICULTURAL CENSUS MONOGRAPH (in the website)