

### Institutional Linkages

SSU is institutionally and physically located within the NSSC at Semtokha and already has strong links with other units like the Soil and Plant Analytical Laboratory (SPAL) by having all soil chemical analysis carried out there. SSU also works very closely with the Soil Fertility Unit (SFU) and the Soil Microbiology Unit within NSSC.

SSU is a multi-client organisation and endeavours to supply information about the distribution and properties of soils and land to any organisation – governmental, NGO or private – that requires such information for development or conservation within Bhutan.

DoA: SSU cooperates closely with the Department of Agriculture (DoA) in carrying out Land Conversion Activity.

RNR-RC: SSU works very closely with the RNR-RCs. To date, SSU has completed doing detailed soil survey of all the four RNR-RC centres and also some of their sub-centres. However, RNR-RCs are helping SSU in supplying crop requirements for building the land suitability evaluation system.

Sherubtse: SSU has established good contacts with the Department of Geography & Planning of Sherubtse College and has agreed to provide all the available soil information to the Department to facilitate in teaching the students.

CNR: SSU also works closely with the College of Natural Resources (former NRTI). SSU staff helped CNR in describing soil profile pits for its on-going research on red soils.

NLCS: SSU gets all the topographic information for soil surveys from the National Land Commission Secretariat (former DSLR).

DGM: SSU also gets all the geological information from the Department of Geology & Mines.

### Detailed soil surveys completed

1. RNR-RC, Yusipang (1:2500)
2. RNR-RC, Bajo (1:2000)
3. RNR-RC, Jakar (1:1600)
4. RNR-RC, Khangma (1:2000)
5. Royal Botanic Garden, Serbithang (1:2000)
6. RNR-RC new site, Wyengkhar (1:1667 & 1:1000)
7. Darla RNR sub-centre, Gedu (1:2000)
8. Bhur farm (RNR sub-centre), Gelephu (1:3500)
9. Yusipang Demonstration Plot, Thimphu
10. Lingmethang RNR sub-centre (1:2500)
11. Ramtokto Royal Orchard (1:2500)
12. Nangkor RNR sub-centre (1:1000)

### Semi detailed soil surveys completed

1. Radhi watershed (1:25000)
2. Lingmutey Chhu watershed (1:25000)
3. Lame Gompa, Jakar (1:16667)
4. Nyakulumpa, Punakha (1:12500)
5. Sangma Ri watershed, Drametse (1:25000)
6. Semi-detailed survey of Wochhu Watershed, Paro (1:40,000)

### Soil survey reporting in hand

1. Semi-detailed survey of Puna Tsang Chhu, Punakha

### Working papers

SSU has compiled 30 working papers (WP) detailing BSS systems as OJT documents. Subjects include technical, administrative and computer maintenance techniques. These papers are fully used by the SSU staff. (If interested, please refer BSS Library WP-1 to WP-30).

### Main miscellaneous reports: (54 issued)

#### Training Documents:

1. Version 3 of Soil Survey manual for Bhutan, 2003.
2. Draft physical Land Evaluation system compiled and in use.
3. Draft system for soil series for Bhutan compiled.
4. National soil databank of Bhutan (BHUSOD) established
5. GIS map compilation and production.



Ministry of Agriculture  
Department of Agriculture



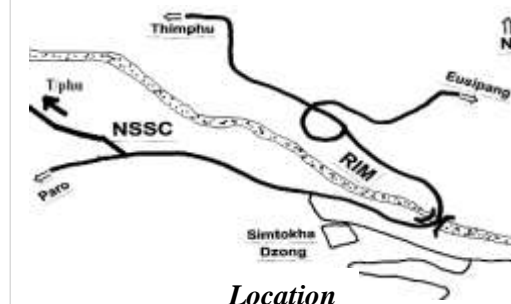
RNR Extension Material 2008

## Soil Survey Unit (SSU)

### Leaflet No. 12



NSSC Complex at Semtokha



Location

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### Soil Survey Unit

The Soil Survey Unit (SSU) was set up as Bhutan Soil Survey Project (BSSP) in September 1996 by inter-governmental agreement between the Royal Government of Bhutan and the Government of Denmark as a stand-alone project. It was incorporated into the Danida funded Environmental Sector programme Support (ESPS) in 1998. The Environment & Urban Sector Programme Support has ceased in December 2006.

The Soil Survey Unit is nationally executed by the national soil surveyors. It is based at Simtokha within the National Soil Services Centre (NSSC) under Department of Agriculture (DoA) of the Ministry of Agriculture.

### SSU Objective

SSU has established a permanent national soil survey capability within the Ministry of Agriculture to provide RGOB and other parties with general information on soils by:

- Training the national soil surveyors in all aspects of soil survey – on the job training plus overseas
- Maintaining a stock of all the necessary field and office equipment to execute field survey plus compile maps and reports
- Carrying out soil surveys at various scales for various purposes and clients
- Gradually studying land in the kingdom and compile soil and land suitability maps
- Development of a National Soil Classification system and, in collaboration with other departments, a system for Land Evaluation to enable the sustainable use of the existing soil and land resources and lead to formalised Land Use Planning
- Development of an integrated Soils Database Management System (DBMS) and a Geographic Information System (GIS) - to collate and manipulate all the collected soils data to allow easy generation of data for others
- In time, when sufficient data are collected, a National Soil Map of Bhutan will be compiled
- Collaborating with International Institutes in soil research into Bhutanese soils
- Collaborating with Department of Agriculture (DoA) to carryout land swapping activities in a more scientific way based on the physical properties of the soil and land

### SSU Capabilities and Services

#### Soil Survey:

Capable of carrying out various level of soil surveys. The level of soil surveys will depend on the density of observation sites, size of the survey area and the scale of the final soil map you want to produce. The details are given below:

Reconnaissance: Maps prepared at scales from 1:100,000 to 1:50,000, site density of about 1 / 5 km<sup>2</sup>

Semi-detailed: Maps prepared at 1:25,000 – 1:10,000 with site density of about 2–5 / km<sup>2</sup>

Detailed: Maps prepared at 1:10,000 – 1:5,000 scale with about 1-2 sites / hectare

Very detailed: Maps prepared at suitable scale for the area and 10-50 sites / hectare



#### Land Suitability Evaluation:

SSU does land suitability evaluation to judge the agronomic potentials of the land in finding out the most suitable crops for a given land and/or what level of inputs are required to optimise the crop yield. As a result the farmers know exactly what crops to be grown and what kind of inputs are required to increase the crop production.

#### Soil Investigation:

SSU does special investigation of soils if there is poor crop growth and/or the crop yield is very low.

#### Land Conversion:

SSU investigates and recommends the Land Conversion

Committee whether the Chhuzhing land in question is feasible for converting into Kamzhing based on the physical properties of the Chhuzhing soils.

#### Land Management:

SSU also has the technical expertise to help the farmers in properly managing their land by: recommending appropriate land use system, recommending ways to improve soil fertility, recommending correct mitigating measures for combating land degradation etc.



#### SSU Staff:

As of July 2008 SSU staff comprised:

Offtg. Program Director: Karma D Dorji

#### RGOB Soil Surveyors:

1. Kado Tshering, Certificate
2. Sangita Pradhan, Diploma
3. Deki Wangmo
4. Kinley Penjor, Diploma
5. Tsheten Dorji, PG Diploma
6. Phuntsho Gyeltshen, BSc
7. Tshering Dorji, MSc
8. Chador Phuntsho (Driver)