

C. Horticulture

Horticulture in Bhutan is defined as fruit and nut crops, generally from trees. The statistics were prepared in terms of the numbers of trees owned rather than the area of land designated as orchard area. Most fruit crops are grown for sale rather than household consumption and owning fruit trees usually indicates improved economic status. The climate in some parts of Bhutan is very favourable for growing crops such as apples which can be exported within the country to hotter areas where these crops do not grow.

In 2000, there were some 2.6 million cultivated fruit and nut trees in Bhutan, mainly apples, areca nuts, guavas, oranges, peaches, pears, plums, and walnuts. The three commercially most significant crops are oranges and areca nuts in the sub-tropical areas and apples in the temperate areas. These three crops account for 96% of horticultural trees planted and 92% of production. A total of 36,000 tonnes of fresh oranges, apples and areca nuts were produced in 2000.

The following maps and tables are presented in this section:

- C.1. Total Number of Horticultural Trees
- C.2. Total Production of Horticultural Crops
- C.3. Apple Production and Households with Different Numbers of Apple Trees
- C.4. Apple Production and Households with Different Numbers of Orange Trees



Total Number of Horticultural Trees

Apples and oranges are the two most important horticultural crops in Bhutan. Table C.1 shows the total number of apple, orange, and other horticultural trees planted in the different districts in 2000. The map shows the districts ranked according to the total number of trees in each district. The superimposed pie charts show the proportion of apple, orange and other trees, and indicate differences in the total number of trees per district.

In 2000, oranges alone accounted for about 68% of all horticultural trees and apples about 14%. About two-thirds of all orange trees are located in the four major orange producing districts of Sarpang, Samdrup Jongkhar, Samtse, and Chhukha. Production is forecast to increase substantially over the next few years as more young orange trees start fruiting and the management of horticulture improves. Apple cultivation is mainly limited to the two districts of Thimphu and Paro, which together account for about 86% of the country's apple production. Areca nut is another important tree crop and is grown mostly in the southern foothills, especially in Samtse and Sarpang. Other less commercially important fruits include guava, walnut, pear, peach, and plum.

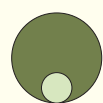
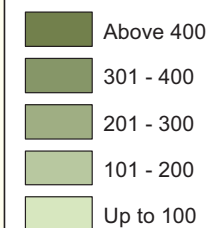
Table C.1

District	Number of Trees				District	Number of Trees			
	Apple	Orange	Others	Total		Apple	Orange	Others	Total
Sarpang	390	278,104	202,704	481,198	Mongar	1,423	24,575	18,033	44,031
S/Jongkhar	92	334,988	40,307	375,387	Punakha	274	26,777	7,757	34,808
Samtse	301	276,293	98,165	374,759	Trashigang	1,233	15,563	16,827	33,623
Chhukha	7,090	287,026	33,258	327,374	Ha	24,841	2,476	4,155	31,472
Paro	212,036	3,522	2,427	217,985	Trashy Yangtse	443	7,835	10,455	18,733
Tsirang	26	147,442	4,156	151,624	Wangdue	2,935	8,277	5,117	16,329
Dagana	262	146,254	1,380	147,896	Bumthang	11,812	25	4,020	15,857
Zhemgang	113	124,822	5,086	130,021	Trongsa	385	7,896	3,386	11,667
Thimphu	103,305	2,978	7,662	113,945	Lhuntse	1,286	4,810	5,001	11,097
Pemagatshel	141	61,226	1,883	63,250	Gasa	25	141	722	888
Bhutan Total						368,413	1,761,030	472,501	2,601,944

Total Number of Horticultural Trees

LEGEND

Total number of trees
in '000



Max: 481,198 (Sarpang)

Min: 888 (Gasa)

Note: Pie chart area proportional
to value within range

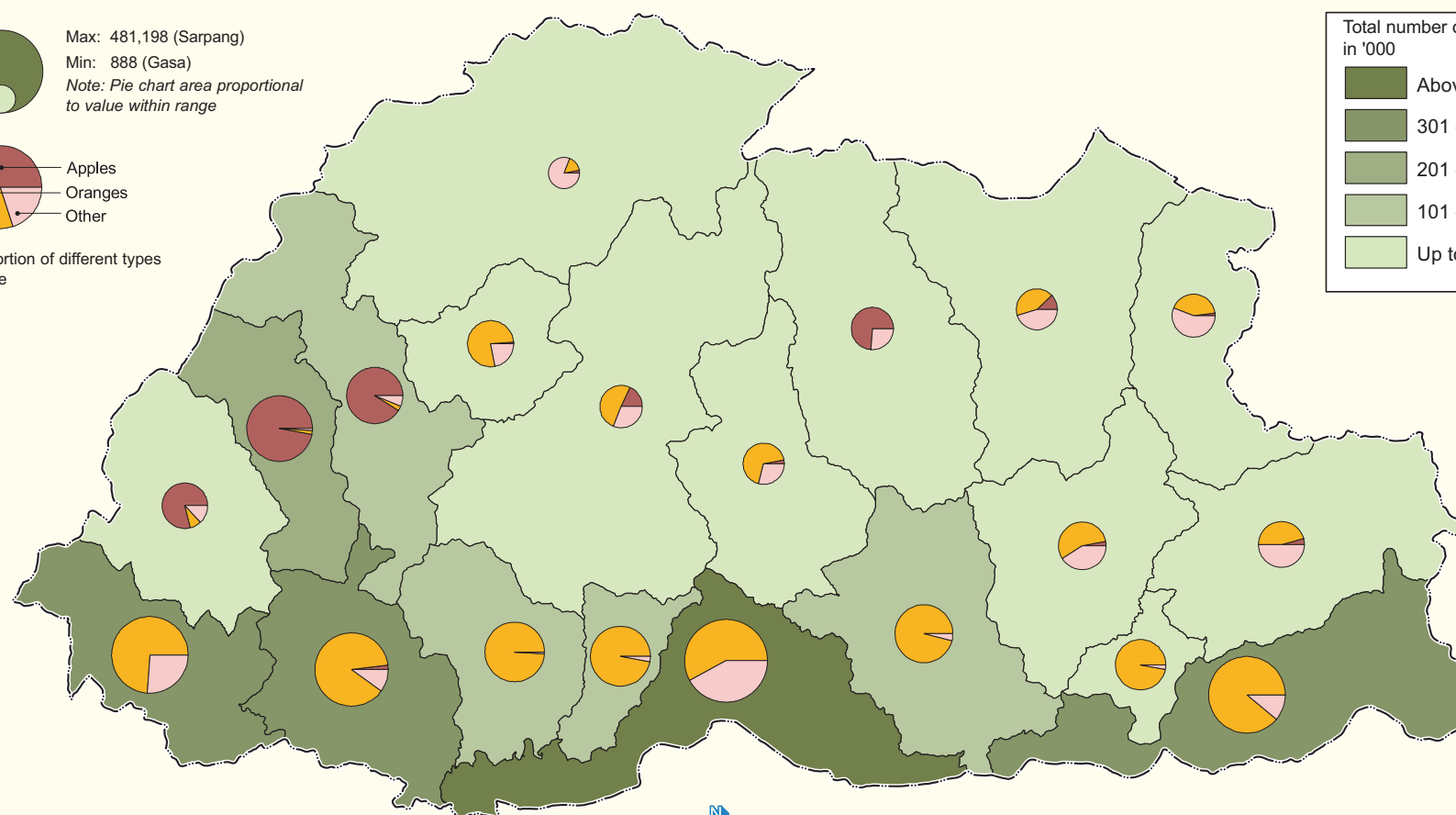


Apples

Oranges

Other

Proportion of different types
of tree



Scale 1:1,500,000



Base Map: Department of Survey and Land Records,
Ministry of Agriculture

Data Source: RNR Statistics 2000, Ministry of Agriculture



PPD, MOA



Total Production of Horticultural Crops

Table C.2 shows the annual production in tonnes of apples, oranges, and other horticultural tree crops in the different districts in 2000. The map shows the districts ranked in order of total production of all fruits. The superimposed pie charts show the proportion of production from apples, oranges and other crops, and indicate differences in the total production per district. (Maps C3 and C4 on the following pages show the production of apples and oranges separately.)

Around 90% of Bhutan's apple production in 2000 came from the two districts of Thimphu and Paro. Paro had twice as many apple trees as Thimphu but the apple production was greater in Thimphu. Bumthang and Ha districts also produce a fair number of apples, but their quality is still not comparable to those produced in Thimphu and Paro. As new varieties are introduced, it is likely that apple production will increase in other districts as well.

Oranges account for more than 75% of total horticultural production and are more widespread than apples. Whereas apple production is more or less limited to two districts, orange production is widespread in the south where climatic conditions are favourable. All the southern districts produced over 1,000t of oranges. Five districts produce large quantities of oranges, and nine can be considered important producers. Sarpang produced the most oranges (6800t) followed by Samdrup Jongkhar, Samtse, and Tsirang. Oranges are grown to some extent in almost all districts, but as with apples the scale and quality of production, and therefore their commercial value, are generally not comparable to those in the main producing areas. The production of oranges is much higher than the production of apples due to the more favourable climatic conditions, thus the southern districts had a much higher total production of horticultural tree crops. Sarpang produced the most overall, followed by Samdrup Jongkhar and Samtse. Gasa produced almost no horticultural tree crops.

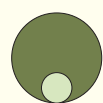
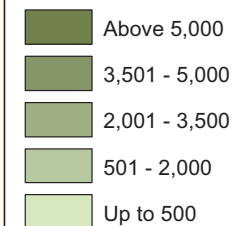
Table C.2

District	Annual Production (t)				District	Annual Production (t)			
	Apples	Oranges	Others	Total		Apples	Oranges	Others	Total
Sarpang	21	6,812	728	7,561	Mongar	12	594	488	1,094
S/Jongkhar	1	5,436	406	5,844	Trashigang	20	428	344	792
Samtse	10	3,914	518	4,442	Punakha	4	303	169	477
Tsirang	0	3,670	288	3,957	Trashy Yangtse	3	145	245	393
Chhukha	42	3,069	213	3,324	Wangdue	33	190	143	365
Thimphu	2,585	46	138	2,769	Bumthang	243	<1	83	326
Paro	1,966	30	61	2,057	Ha	133	90	56	279
Zhemgang	2	1,888	51	1,941	Trongsa	10	128	61	199
Dagana	2	1,603	122	1,727	Lhuntse	11	60	126	198
Pemagatshel	15	1,207	79	1,301	Gasa	<1	2	1	3
					Bhutan Total	5,113	29,616	4,319	39,048

Total Production of Horticultural Crops

LEGEND

Total production in tonnes



Max: 7,561 t (Sarpang)

Min: 3 t (Gasa)

Note: Pie chart area proportional to value within range

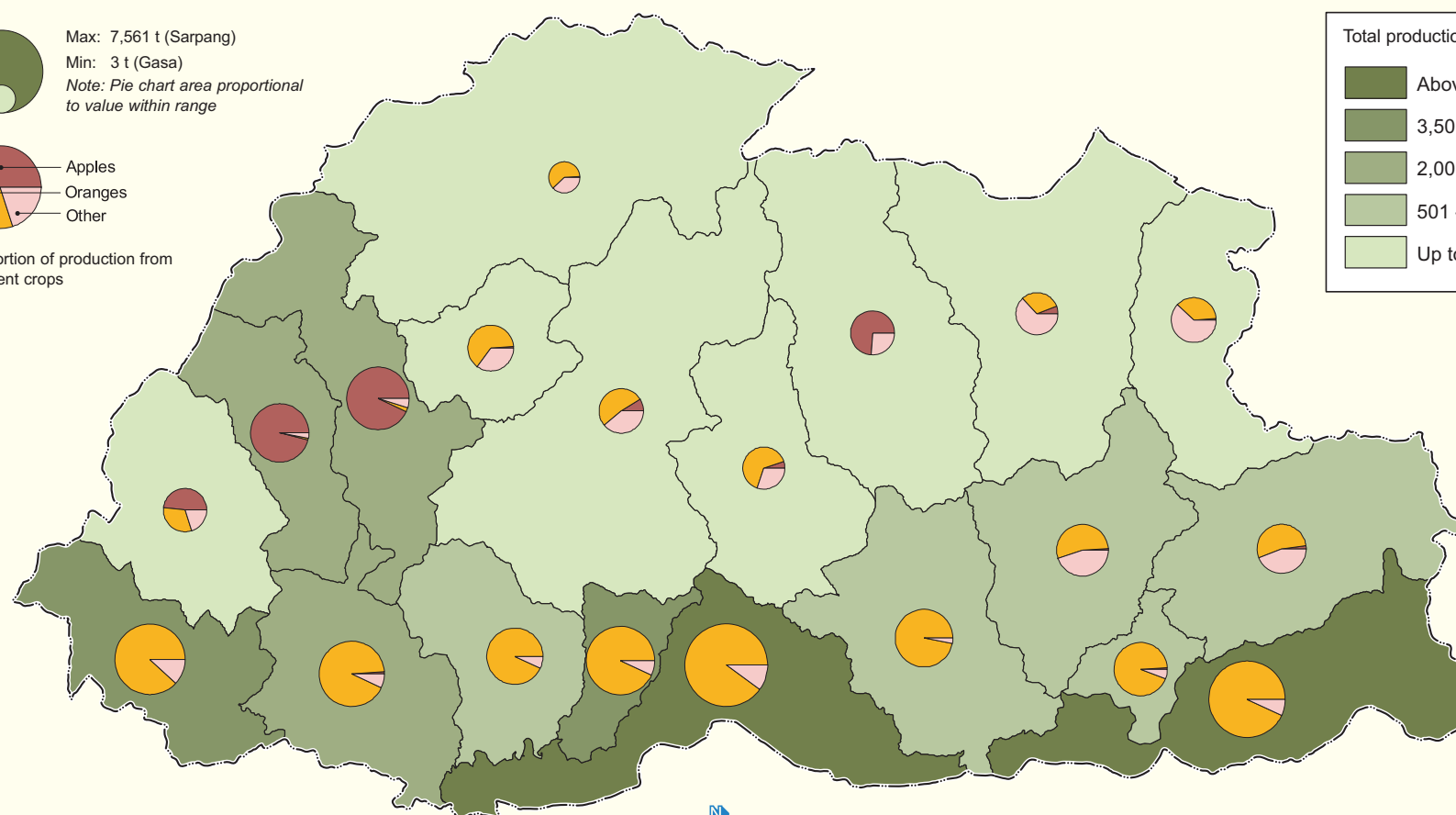


Apples

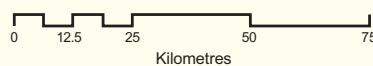
Oranges

Other

Proportion of production from different crops



Scale 1:1,500,000



Base Map: Department of Survey and Land Records,
Ministry of Agriculture

Data Source: RNR Statistics 2000, Ministry of Agriculture



PPD, MOA



Apple Production and Households with Different Numbers of Apple Trees

The census data do not indicate the total number of households that grow apples, they simply show the percentage of apple growing households with numbers of trees in each of three classes. Table C.3 shows these values for the different districts, in order of the percentage of producer households with more than 100 trees. The map shows the districts ranked according to the total production of apples (see Table C.2). The superimposed pie charts show the proportion of producer households with different numbers of trees, and indicate differences in the total production per district.

Apple production is mainly focused in the two districts of Thimphu and Paro, and these districts have to largest proportion of producer households with more than 100 apple trees, indicating a commercial scale of production. There were very few trees in Sarpang, but all were in medium to large plantations. In most other districts, apples are grown by farm households for their own consumption and not for commerce. The total number of trees in Gasa and Tsirang was less than the smallest holding size class.

With continuing research, horticultural production in the country can increase. Different varieties are needed that are better suited to the different agro-ecological conditions – especially varieties of apples better suited to conditions in the south.

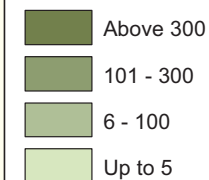
Table C.3

Districts	< 25	25 – 100	> 100	Districts	< 25	25 – 100	> 100
Thimphu	27	36	37	Gasa	(100)	0	0
Paro	22	46	32	Trongsa	79	21	0
Ha	34	51	15	Zhemgang	80	20	0
Chhukha	47	34	19	Sarpang	0	(33)	(67)
Punakha	94	0	6	Mongar	90	7	3
Lhuntse	74	22	4	Tsirang	(100)	0	0
Wangdue	78	18	4	Trashy Yangtse	85	15	0
Bumthang	71	25	4	Trashigang	96	4	0
Dagana	43	57	0	Pemagatshel	63	38	0
Samtse	na	na	na	S/Jongkhar	80	20	0
				Average*	41	36	22
na = not available; * simple averages, not weighted							

Apple Production and Households with Different Numbers of Apple Trees

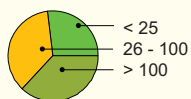
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Total production
in tonnes

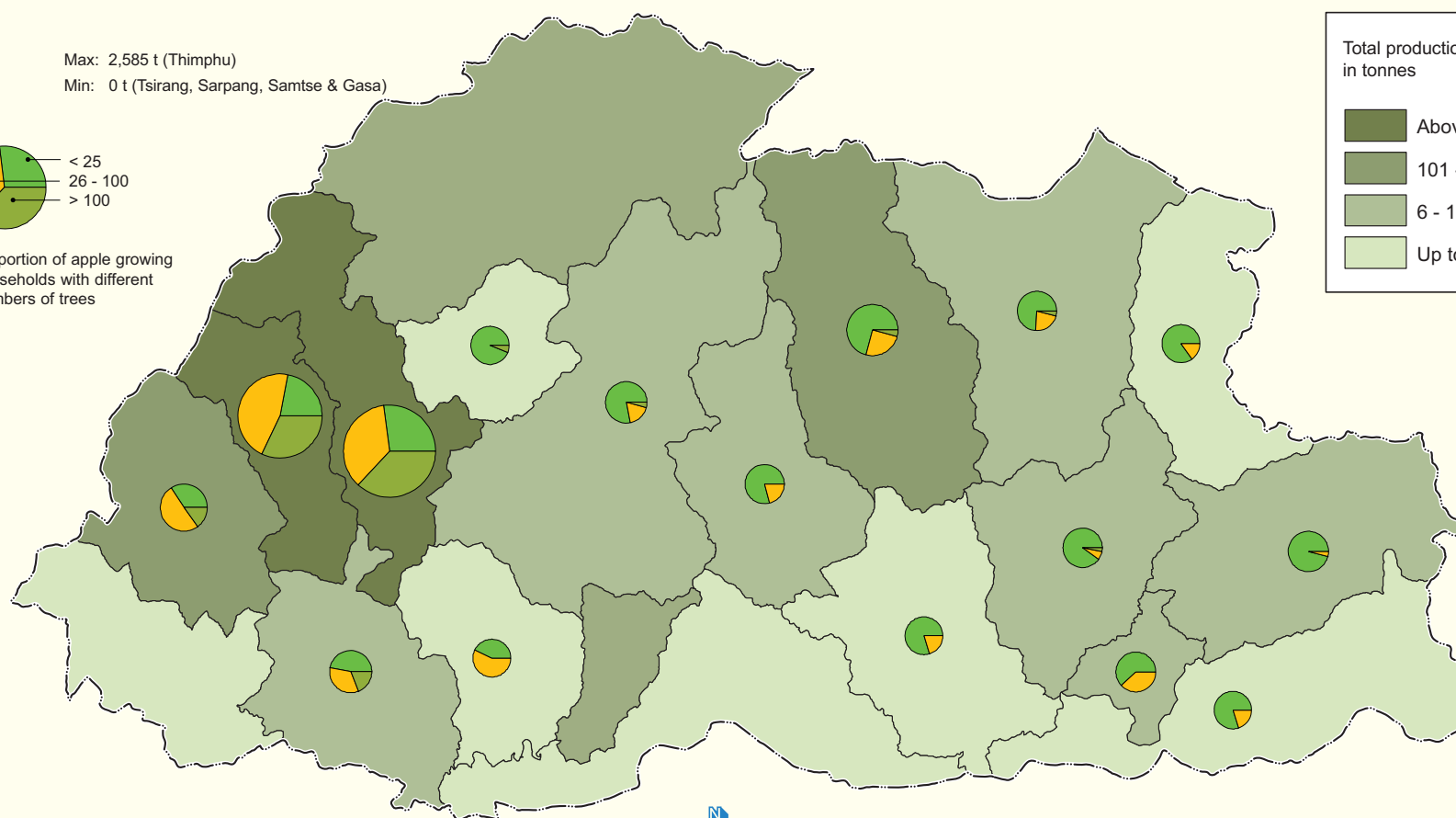


Max: 2,585 t (Thimphu)

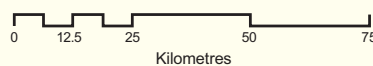
Min: 0 t (Tsirang, Sarpang, Samtse & Gasa)



Proportion of apple growing
households with different
numbers of trees



Scale 1:1,500,000



Base Map: Department of Survey and Land Records,
Ministry of Agriculture
Data Source: RNR Statistics 2000, Ministry of Agriculture



PPD, MOA



Orange Production and Households with Different Numbers of Orange Trees

The census data does not indicate the total number of households that grow oranges, but only the percentage of orange growing households with numbers of trees in each of three classes. Table C.4 shows these values for the different districts, in order of the percentage of producer households with more than 100 trees. The map shows the districts ranked according to the total production of oranges (see Table C.2). The superimposed pie charts show the proportion of producer households with different numbers of trees, and indicate differences in the total production per district.

In the important orange growing districts, one to two-thirds of producer households had more than 100 trees. In all other districts except Ha, most producers had less than 25 trees. There were few trees in Ha, but all were in medium to large plantations. The total number of trees in Bumthang was less than the smallest holding size class.

Oranges are an important horticultural crop and an increasingly important export commodity. It is forecast that orange production will continue to increase in the near future as many of the younger trees start fruiting.

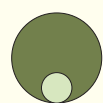
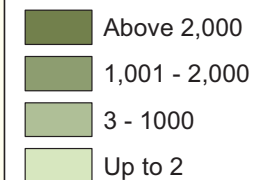
Table C.4

Districts	< 25 Trees	25-100	> 100 Trees	Districts	< 25 Trees	25-100	> 100 Trees
Ha	0	29	71	Thimphu	59	35	6
Sarpang	7	33	60	Punakha	71	25	4
Chhukha	8	38	55	Trongsa	77	18	4
Dagana	14	42	44	Wangdue	85	13	3
Zhemgang	31	32	38	Mongar	80	17	3
Paro	13	52	35	Lhuntse	83	15	3
S/Jongkhar	26	40	34	Yangtse	86	12	2
Tsirang	16	53	31	Trashigang	86	13	2
Samtse	24	46	29	Gasa	93	7	0
Pemagatshel	57	35	9	Bumthang	(100)	0	0
				Average*	46	28	22
* Simple averages, not weighted							

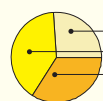
Orange Production and Households with Different Number of Orange Trees C 4

LEGEND

Total production
in tonnes

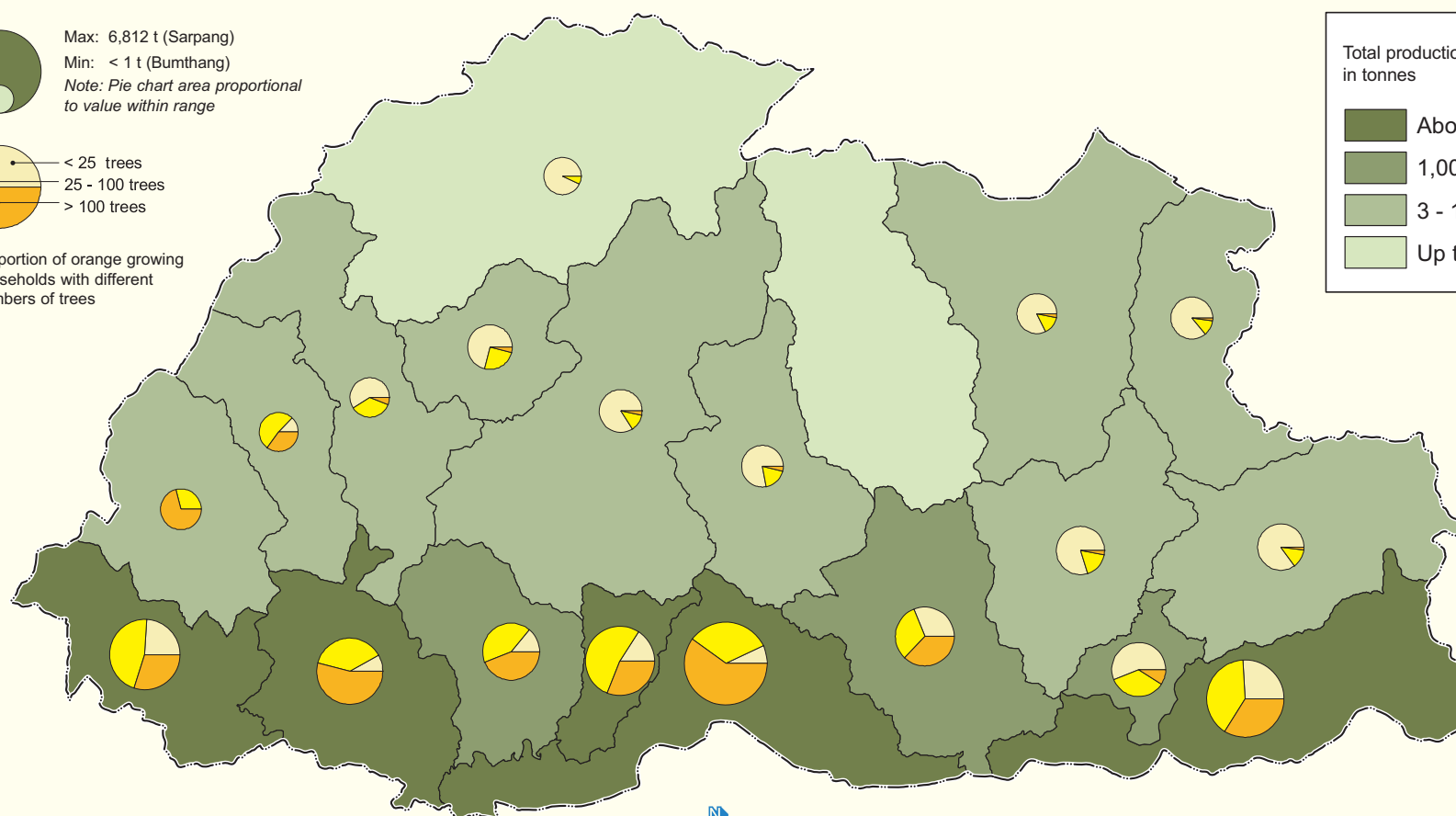


Max: 6,812 t (Sarpang)
Min: < 1 t (Bumthang)
Note: Pie chart area proportional
to value within range

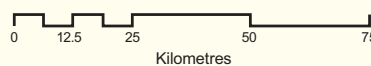


< 25 trees
25 - 100 trees
> 100 trees

Proportion of orange growing
households with different
numbers of trees



Scale 1:1,500,000



Base Map: Department of Survey and Land Records,
Ministry of Agriculture
Data Source: RNR Statistics 2000, Ministry of Agriculture



PPD, MOA



