

A. Agricultural Land

Agricultural land includes all land that is registered as land used for agriculture (even if it is occasionally left fallow). The two main types of arable agricultural land that are differentiated are ‘chushing’ or wetland, which is terraced, mostly irrigated, land used mainly to grow paddy, and ‘kamshing’ or dryland, which is sloping, mostly rainfed, but not terraced land.

This section provides some basic statistics related to agricultural land use in Bhutan and gives information on the size of the districts, the distribution of landholdings and the number of households.

The following maps and tables are included in this section:

- A.1. Agricultural Land as a Percentage of Total District Area
- A.2. Proportions of Different Types of Agricultural Land
- A.3. Agricultural Area by Landholding Size
- A.4. Farm Households by Agricultural Landholding Size
- A.5. Households Owning Wetland (Chushing) and Size of Landholdings
- A.6. Households Owning Dryland (Kamshing) and Size of Landholdings

In 2000, the breakdown by agricultural land type was as follows: chushing 21%, kamshing 43%, shifting cultivation 27%, orchards 8%, and kitchen garden 1%. Overall 58% of farm households owned wetland. The districts of Paro, Samtse, Punakha, Sarpang, Dagana, Tsirang, Wangdue, and Trashigang together contain about 71% of the country's total wetland.



Agricultural Land as a Percentage of Total District Area

Table A.1 shows the total land area of each of the twenty districts of Bhutan, the percentage of agricultural land in each districts (according to LUPP 1995), and the number of households per district arranged in descending order of agricultural land as a percentage of total district area. In the absence of demographic data, the number of households provides an approximation for the population. The map shows the districts ranked by agricultural land as a percentage of total district area.

According to the LUPP 1995, less than 8% of Bhutan's land area is agricultural land (Table 2.2). The LUPP was based on satellite imagery. At the district level, the agricultural land as percentage of total district area ranges from 45% in Pemagatshel to less than 1% in Gasa.

Table A.1

District	Total area* of district (km ²)	Agricultural Land*		No. of + farming households	District	Total area of district (km ²)	Agricultural Land		No. of farming households
		Total area (km ²)	% district area				Total area (km ²)	% district area	
Pemagatshel	518	235	45.3	2657	Trashigang	2316	329	14.2	7971
Tsirang	639	139	21.7	3005	Dagana	1389	176	12.7	2679
Samdrup Jongkhar	2312	421	18.2	5008	Sarpang	2344	284	12.1	4223
Samtse	1584	249	15.7	3690	Zhemgang	2127	225	10.6	1758
Trashigang	2316	329	14.2	7971	Mongar	1947	191	9.8	4920
Dagana	1389	176	12.7	2679	Chhukha	1792	167	9.3	3437
Wangdue	4070	94	2.3	2899					
Bumthang	2831	59	2.1	1390					
Thimphu	2041	39	1.9	1569					
Ha	1747	33	1.9	1110					
Gasa	4561	9	0.2	464					
Bhutan Total						40,973	3237	7.9	58,565

* Values from LUPP 1995

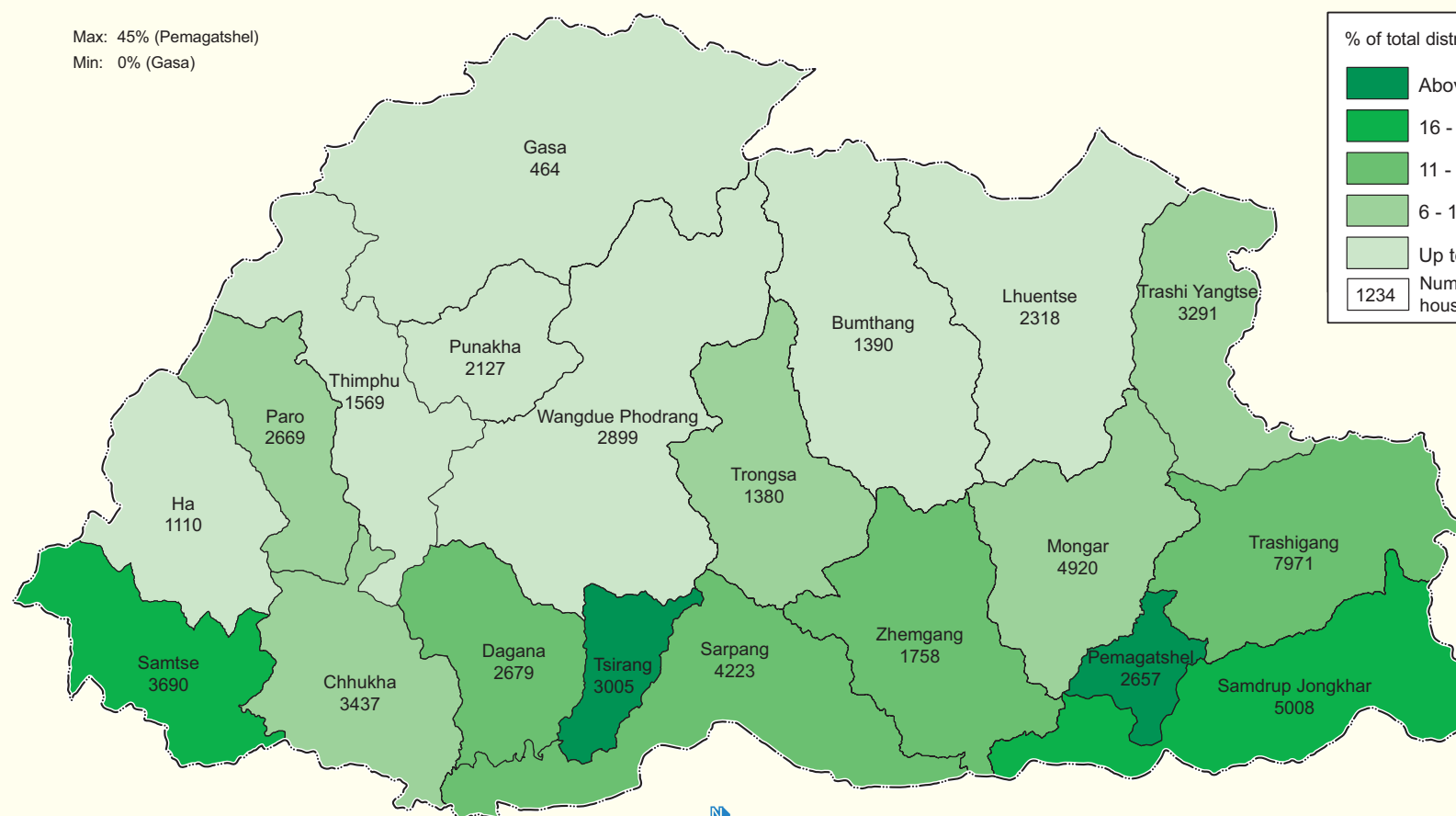
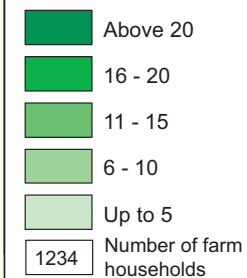
+ Values from RNR 2000

Agricultural Land as a Percentage of Total District Area

Max: 45% (Pemagatshel)
Min: 0% (Gasa)

LEGEND

% of total district area



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



Proportion of Different Types of Agricultural Land

The values for the different types of agricultural land are taken from the RNR survey data. Table A.2 shows the districts in descending order of total agricultural land with the breakdown by agricultural land type. The map shows the districts ranked by total agricultural area with a pie chart showing the proportion of different land types. Note that the values for agricultural land area are rather different to those estimated by LUPP (1995) from satellite data. The total area of registered agricultural land was 262,363 acres or 1062 sq.km, 2.6% of the total land area.

Overall the southern districts have the most favourable conditions for agriculture in terms of both climatic conditions and general topography, Samtse, Sarpang, Chhukha, and Samdrup Jongkhar in the south, and Trashigang in the east, had the greatest amounts of agricultural area with more than 20,000 acres each on average. Samtse had the most agricultural area (37,390 acres) and Gasa the least (882 acres).

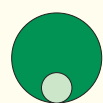
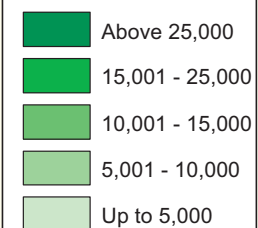
Table A.2

District	Wetland/ Chushing (acres)	Dryland/ Kamshing (acres)	Shifting Cultivation (acres)	Kitchen Garden (acres)	Orchard (acres)	Total* (acres)	District	Wetland/ Chushing (acres)	Dryland/ Kamshing (acres)	Shifting Cultivation (acres)	Kitchen Garden (acres)	Orchard (acres)	Total (acres)
Samtse	8,120	13,936	9,839	89	5,406	37,390	Paro	3,285	4,266	561	227	1,277	9,616
S/Jongkhar	2,407	12,058	9,991	96	2270	26,822	Trashigang	1,879	4,293	2,554	81	100	8,907
Sarpang	7,774	12,205	1,875	247	4,201	26,302	Wangdue	4,250	3,663	457	283	181	8,834
Trashigang	3,084	13,131	7,390	261	148	24,014	Lhuntse	2,006	3,388	2,544	123	100	8,161
Chhukha	2,108	6,859	11,068	98	1,799	21,932	Pemagatshel	100	2,960	3,309	75	145	6,589
Dagana	3,209	7,142	1,765	87	1,538	13,741	Trongsa	1,565	2,291	1,987	138	135	6,116
Zhemgang	1,630	3,779	6,751	79	543	12,782	Punakha	4,783	690	239	182	177	6,071
Tsirang	3,979	5,944	551	99	1,775	12,348	Thimphu	1,799	1,080	242	117	820	4,058
Mongar	1,234	7,549	3,122	110	157	12,172	Ha	339	2,020	1,197	78	413	4,047
Bumthang	275	5,183	5,708	253	160	11,579	Gasa	243	339	100	100	100	882
* Total registered agricultural land							Bhutan Total	54,069	112,776	71,250	2,823	21,445	262,363

Proportion of Different Types of Agricultural Land

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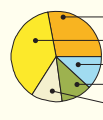
Total registered agricultural land in acres



Max: 37,390 acres (Samtse)

Min: 882 acres (Gasa)

Note: Pie chart area proportional to value within range



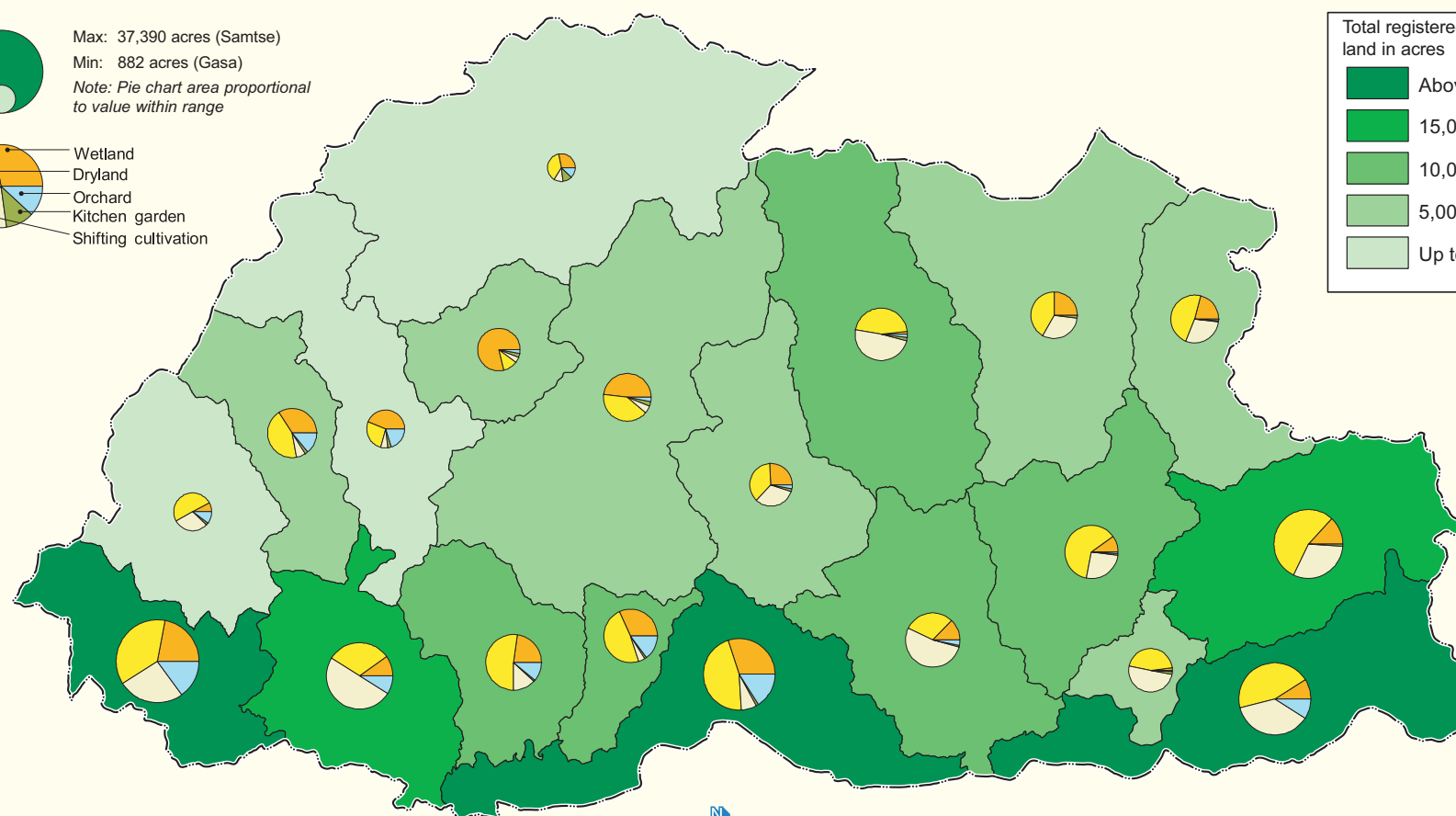
Wetland

Dryland

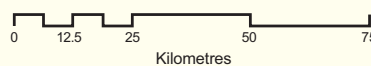
Orchard

Kitchen garden

Shifting cultivation



Scale 1:1,500,000



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

Data Source: RNR Statistics 2000, Ministry of Agriculture



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Agricultural Area by Landholding Size

The proportion of agricultural land contained in landholdings of different size gives important information about the characteristics of land availability for agricultural farming. It provides an indication of the number of large or small farms and of production efficiency.

Table A.3 shows the percentage of agricultural land held in different sizes of landholdings in each district, with the districts listed in descending order of the percentage of land contained in large landholdings (more than 10 acres). The map shows the districts ranked according to the percentage of land in landholdings of more than 10 acres. The pie charts show the proportion of agricultural land in each of the three different landholding size categories and indicate the proportion in landholdings of more than 10 acres.

In 2000, around half of the agricultural land in all districts except Bumthang was held in medium size holdings (3-10 acres), with the remainder divided almost equally between small (<3 acres) and large (>10 acres) holdings depending on the district. Bumthang had the largest proportion of agricultural land in large landholdings (73%) and Trashigang the smallest (6%).

Table A.3

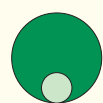
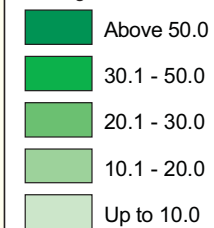
District	Landholding size (acres)			District	Landholding size (acres)		
	< 3	3 – 10	> 10		< 3	3 – 10	> 10
Bumthang	3.1	24.3	72.6	Paro	19.4	57.8	22.9
Chhukha	6.2	41.8	51.9	Lhuntse	23.2	57.0	19.8
Samtse	6.7	47.7	45.6	Wangdue	32.2	52.4	15.4
Zhemgang	4.2	51.3	44.5	Tsirang	15.0	71.8	13.2
S/Jongkhar	9.1	52.0	38.9	Trashigang	26.6	60.9	12.5
Sarpang	4.1	63.1	32.8	Pemagatshel	45.0	44.9	10.1
Ha	29.4	40.8	29.9	Mongar	42.1	49.1	8.7
Trongsa	13.4	57.7	28.9	Punakha	39.3	52.7	8.0
Dagana	7.9	65.5	26.5	Gasa	42.8	49.3	7.9
Thimphu	31.2	42.0	26.8	Trashigang	44.5	49.8	5.6
				Average*	22.3	51.6	26.1

* Simple averages, not weighted

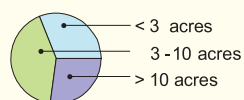
Agricultural Area by Landholding Size

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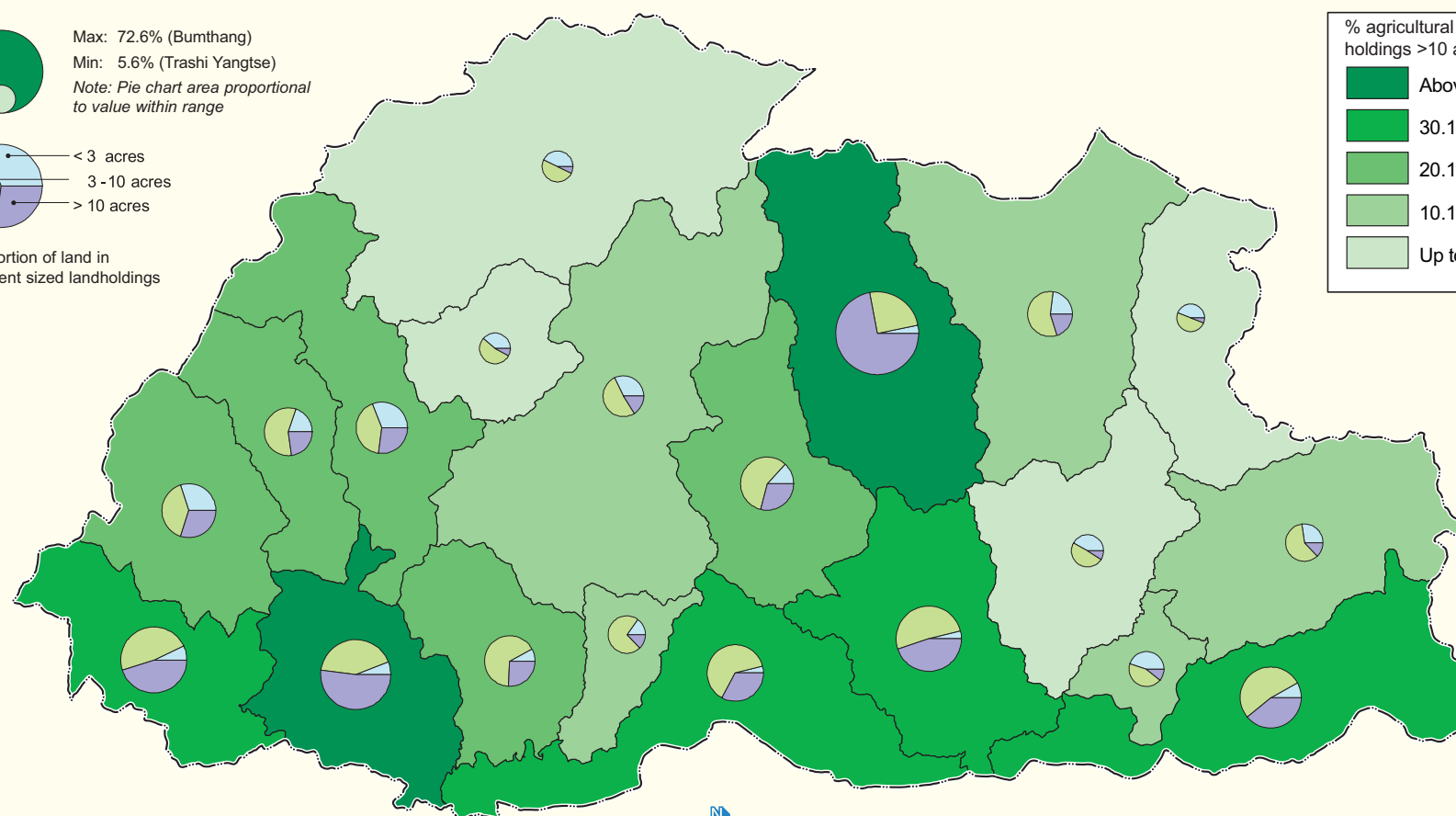
% agricultural land in holdings >10 acres



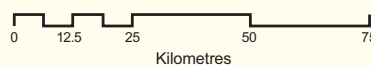
Max: 72.6% (Bumthang)
Min: 5.6% (Trashigang)
Note: Pie chart area proportional to value within range



Proportion of land in different sized landholdings



Scale 1:1,500,000



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



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Farm Households by Agricultural Landholding Size

The percentage of farm households with landholdings of different sizes in each district gives an insight into the nature of land distribution among the farming communities in the country.

Table A.4 shows the percentage of households in 2000 having agricultural landholdings in the size classes small (< 3 acres), medium (3-10 acres), and large (>10 acres) with the districts listed in order of the percentage with large landholdings. The map shows the districts ranked according to the percentage of households owning more than 10 acres. The pie charts show the proportion of households with landholdings in the different size classes.

In most districts, the great majority of households owned less than 10 acres, and in 15 districts the majority of households owned less than 3 acres. Bumthang had the highest percentage of households owning more than 10 acres (37%) and Trashigang the lowest (8%).

Table A.4

District	Landholding size (acres)			District	Landholding size (acres)		
	< 3	3 - 10	>10		< 3	3 - 10	> 10
Bumthang	25.4	37.9	36.8	Lhuntse	53.2	42.8	3.9
Zhemgang	16.1	61.6	22.2	Tsirang	38.7	57.8	3.5
Chhukha	28.3	50.2	21.5	Thimphu	73.0	23.6	3.4
Samtse	29.9	52.9	17.2	Trashigang	58.6	38.5	2.9
S/Jongkhar	33.2	52.8	14.0	Wangdue	65.0	32.9	2.1
Sarpang	18.6	68.9	12.4	Pemagatshel	71.4	25.9	1.8
Dagana	27.1	63.0	9.8	Punakha	68.9	29.7	1.5
Trongsa	40.8	49.7	9.7	Gasa	74.5	24.1	1.5
Paro	51.5	42.8	5.7	Mongar	69.4	29.2	1.3
Ha	66.0	28.3	5.6	Trashigang	69.7	29.5	1.0
				Average*	47.4	43.9	8.0

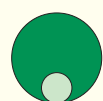
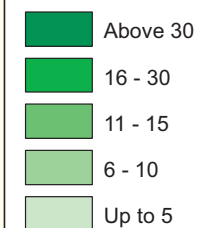
* Simple averages, not weighted

Farm Households by Agricultural Landholding Size

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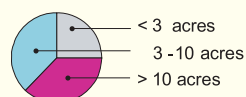
% households owning
>10 acres



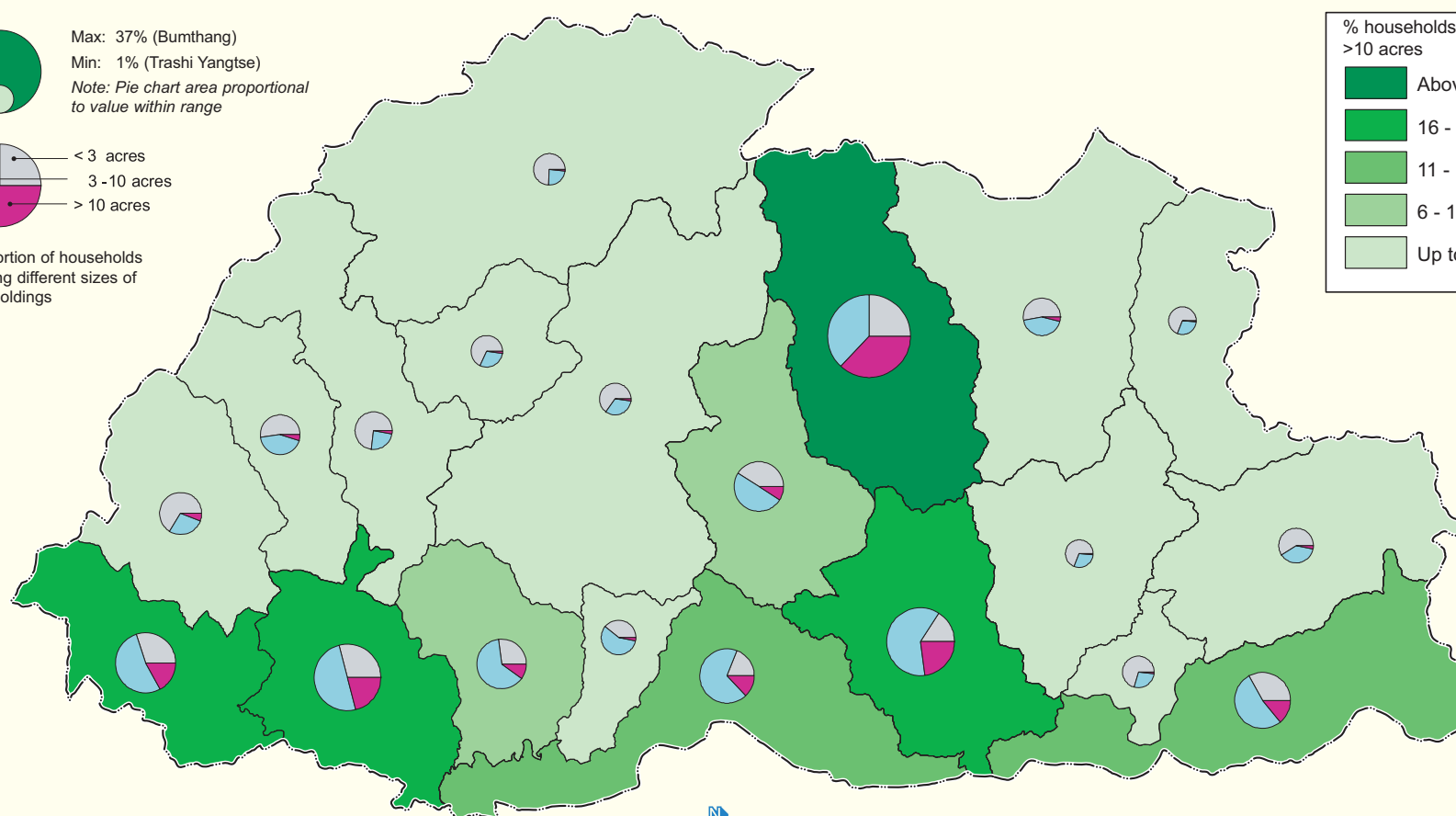
Max: 37% (Bumthang)

Min: 1% (Trashigang)

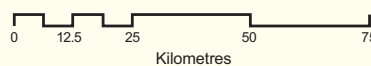
Note: Pie chart area proportional
to value within range



Proportion of households
owning different sizes of
landholdings



Scale 1:1,500,000



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

Data Source: RNR Statistics 2000, Ministry of Agriculture



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Households Owning Wetland (Chushing) and Size of Landholdings

Chushing or wetland cultivation, in which terraced areas are irrigated to grow crops (mainly paddy), constitutes an important form of land use. Ownership of chushing is normally considered a good indicator of food sufficiency.

Table A.5 shows the percentage of households that owned chushing in 2000 and the percentage of these landholdings in different size classes with the districts listed in descending order of the percentage of households owning chushing. The map shows districts ranked according to the percentage of households that own chushing. The superimposed pie charts show the proportion of chushing landholdings in the different size classes and indicate the overall percentage of households in each district who own chushing. Punakha district had the highest percentage of households owning chushing (90%), followed by Trongsa and Trashhi Yangtse, and Pemagatshel the lowest (4%) followed by Bumthang.

The landholdings of chushing are relatively small with the majority of farm households in most districts, and more than 90% in Trashhi Yangtse, Trashigang and Mongar, owning less than 3 acres.

Table A.5

District	Landholding Size (acres)			% of HHs Owning Chushing	District	Landholding Size (acres)			% of HHs Owning Chushing
	< 3	3 - 10	> 10			< 3	3 - 10	> 10	
Punakha	50.4	46	3.6	90	Tsirang	47.3	52.7	0.0	65
Trongsa	74.3	25.7	0.0	84	Thimphu	46.7	37.1	5.2	59
Trashhi Yangtse	95.5	4.5	0.0	82	Trashigang	90.3	7.9	1.8	57
Zhemgang	84.8	13.9	1.3	80	Chhukha	65.1	24.1	0.8	53
Lhuntse	77.4	19.1	3.6	77	Mongar	90.9	5.8	3.2	47
Sarpang	45.2	50.2	5.6	73	Gasa	69.3	24.5	6.2	45
Wangdue	48.9	46.6	4.5	71	S/Jongkhar	54.8	41.9	3.2	36
Dagana	65.6	34.4	0.0	70	Ha	64.8	35.2	0.0	21
Paro	54.6	43.3	2.1	69	Bumthang	52.6	47.5	0.0	13
Samtse	50.5	45.6	3.8	65	Pemagatshel	84.1	15.9	0.0	4
					Average*	60.2	36.9	2.4	58

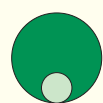
* Simple averages, not weighted

Households Owning Wetland (Chushing) and Size of Landholdings

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% households owning wetland (chushing)

- Above 80
- 61 - 80
- 41 - 60
- 21 - 40
- Up to 20



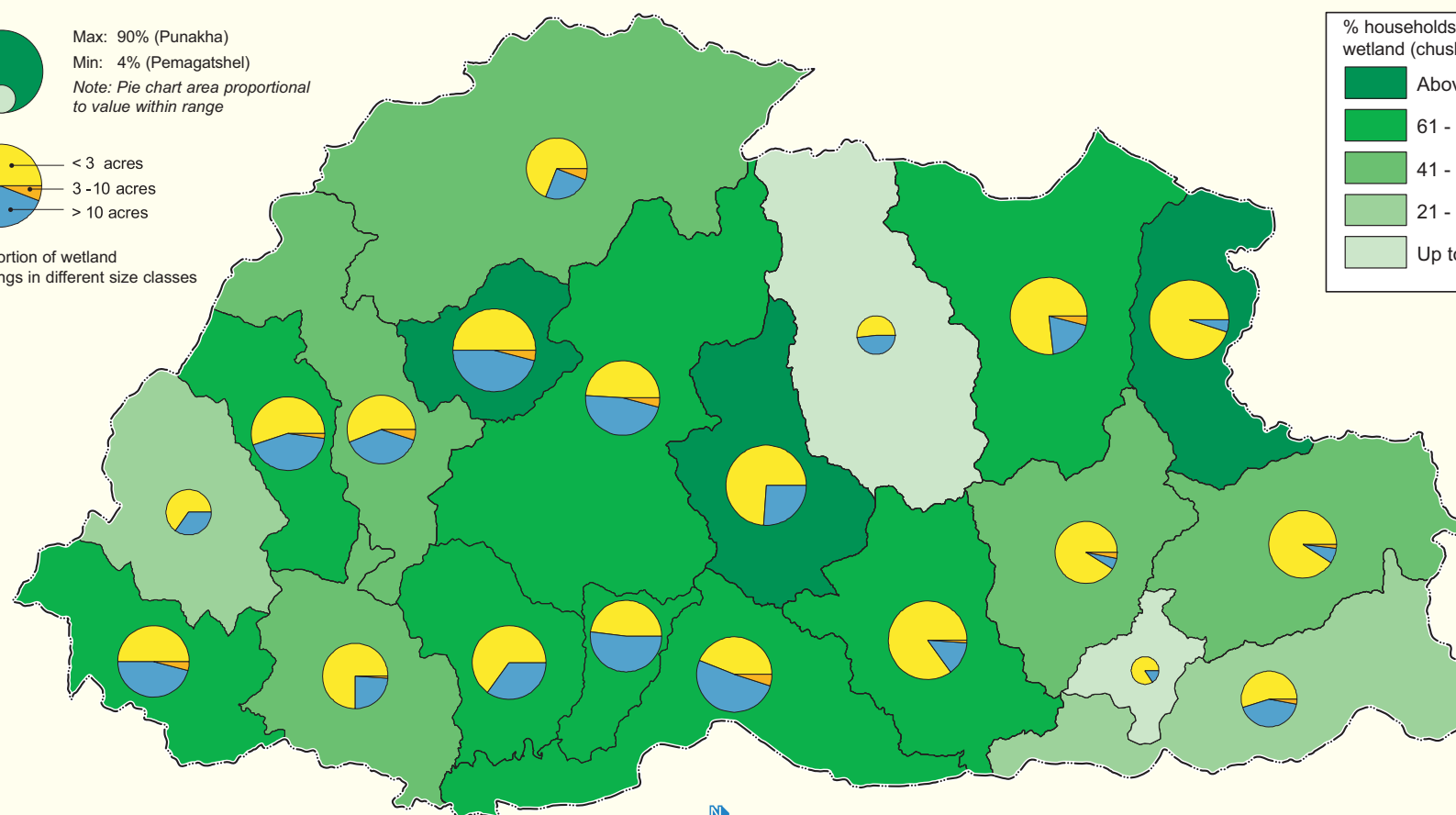
Max: 90% (Punakha)
Min: 4% (Pemagatshel)

Note: Pie chart area proportional to value within range



< 3 acres
3 - 10 acres
> 10 acres

Proportion of wetland holdings in different size classes



Scale 1:1,500,000

0 12.5 25 50 75
Kilometres

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



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Households Owning Dryland (Kamshing) and Size of Landholdings

Kamshing or dryland agriculture, growing of crops on untterraced and mostly unirrigated sloping land, is another important form of agricultural land use. Almost all farm households own some dryland where they cultivate crops such as maize, wheat, barley, buckwheat, millet, and potato.

Table A.6 shows the percentage of households owning kamshing in each district in 2000 and the percentage of these landholdings in different size classes listed in descending order of the percentage of households owning kamshing. The map shows the districts ranked according to the percentage of households that own kamshing. The superimposed pie charts show the proportion of kamshing landholdings in different size classes and indicate the overall percentage of households in each district who owned kamshing. Overall the percentage of households owning kamshing was considerably higher than the percentage owning chushing (average 85% across the districts compared to 58%). Typically, the districts in the eastern part of the country led in terms of kamshing ownership. Mongar had the highest percentage of households owning kamshing (98%), followed by Trashi Yangtse, and Pemagatshel. Punakha district, which had the highest percentage of households owning chushing, had the lowest percentage of households (38%) owning kamshing.

In general kamshing landholdings are larger than chushing landholdings, with the proportion of landholdings being almost equally distributed between the small and medium classes.

Table A.6

District	Landholding Size (acres)			%HHs Owning Kamshing	District	Landholding Size (acres)			%HHs Owning Kamshing
	< 3	3 - 10	> 10			< 3	3 - 10	> 10	
Mongar	75.6	23.2	1.2	98	Samtse	40.2	53.6	6.2	89
Trashhi Yangtse	82.1	17.1	0.8	97	Gasa	78.2	21.7	0.0	89
Pemagatshel	90.2	9.0	0.7	97	Chhukha	42.1	54.2	3.8	88
Ha	64.7	35.2	0.0	96	Sarpang	30.8	64.3	4.2	85
Zhemgang	52.9	43.4	3.6	95	Dagana	23.8	68.0	8.2	84
S/Jongkhar	40.0	44.9	15.0	95	Tsirang	40.0	58.1	1.8	83
Trashigang	62.7	35.9	1.3	93	Paro	33.5	55.5	11.0	73
Lhuntse	63.1	33.6	2.3	91	Wangdue	60.5	29.1	10.4	72
Bumthang	14.6	52.5	32.9	90	Thimphu	59.7	40.2	0.0	53
Trongsa	58.2	38.4	3.4	90	Punakha	80.4	19.6	0.0	38
					Average*	49.0	44.7	5.8	85

* Simple averages, not weighted

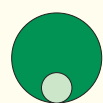
Households Owning Dryland (Kamshing) and Size of Landholdings

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% households owning dryland

- Above 95
- 86 - 95
- 76 - 85
- 66 - 75
- Up to 65



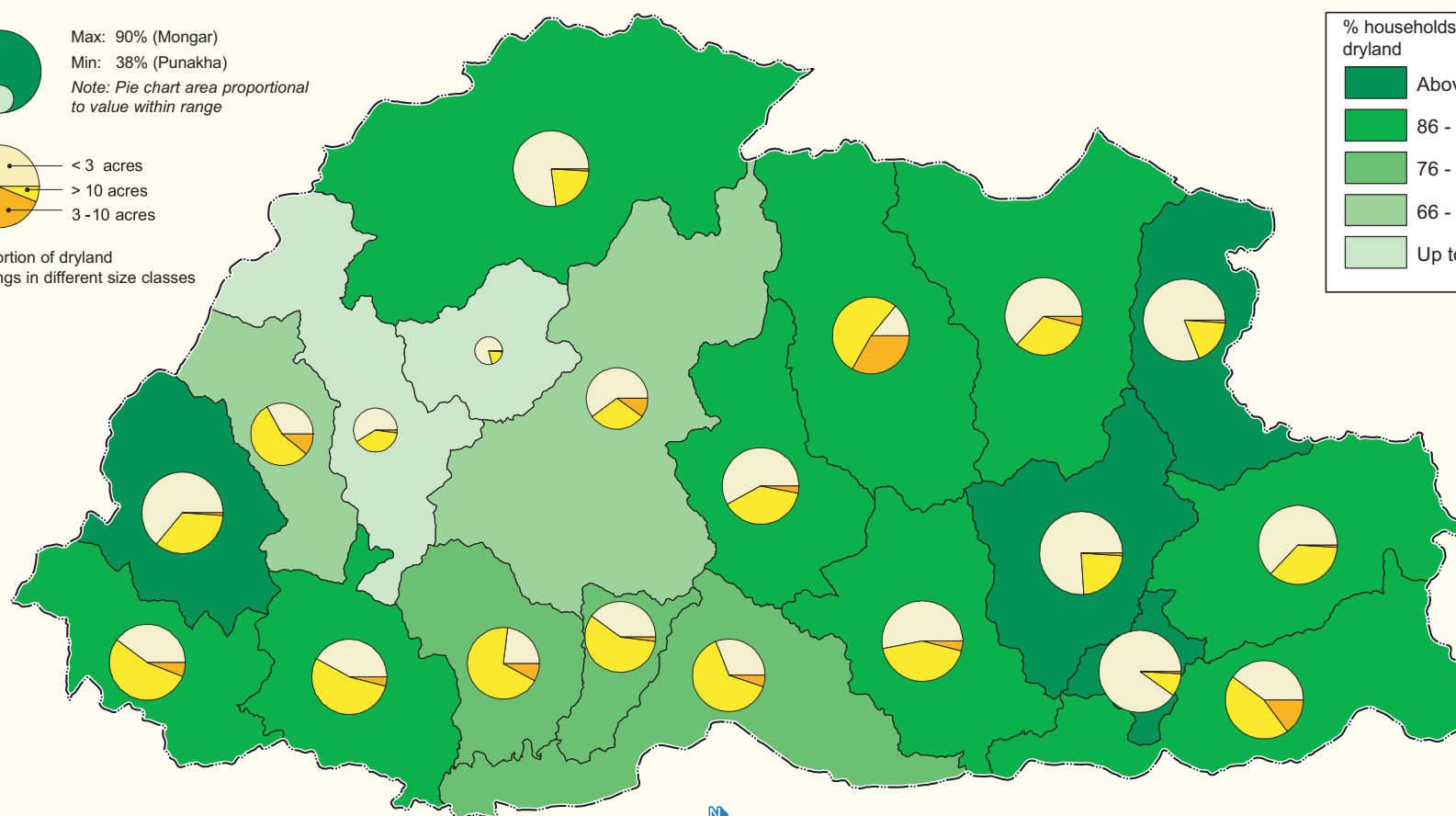
Max: 90% (Mongar)
Min: 38% (Punakha)

Note: Pie chart area proportional to value within range



< 3 acres
> 10 acres
3 - 10 acres

Proportion of dryland holdings in different size classes



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

