

G. Major Constraints to Farming

Destruction of food crops by wildlife presents a continuing significant loss to farmers. Wild boar (a recurring theme at any agricultural meeting) is a particular hazard; more than 36% of farm households reported losses directly caused by these creatures. Monkeys, elephants, deer, and bears also trouble farmers. Farmers also experience constraints related to labour shortages, lack of irrigation facilities, and limited access to markets. Mechanisation of farming has limited scope in Bhutan's rugged terrain and is restricted to small flat agricultural pockets; however, in places where mechanisation has been introduced, it has helped to ease the problem of labour shortages and has increased productivity.

The following maps and tables are presented in this section:

- G.1. Farm Households Reporting Constraints Affecting Crop Production
- G.2. Animal Damage by Type of Animal
- G.3. Percentage of Farm Households Reporting General Constraints
- G.4. Farm Households by Distance (Walking Time) to the Nearest Motorable Road



Farm Households Reporting Constraints Affecting Crop Production

Table G1 shows the percentage of households affected by constraints of different types in 2000 in each district, listed in order of the percentage suffering problems from wild animals. The map shows the districts ranked according to the total percentage of households affected by wild animals. The superimposed bar charts show the percentage of households affected by wild animals, pests and diseases, and others.

Damage caused by wild animals remained the single worst constraint faced by farm households all over Bhutan and is the leading factor in loss of food grain. The problem is exacerbated by the fact that farm settlements are widely scattered and that the government strongly encourages conservation of wildlife. In 2000, between 21% and 72% of households in the different districts reported crop damage by wild animals. The district most affected was Bumthang, followed closely by Ha and Pemagatshel.

Problems related to outbreaks of pests and diseases were reported by a small proportion of farmers in all districts except four, with the greatest proportion in Thimphu (10%). Such outbreaks can occur suddenly when crops are vulnerable, and usually there is little possibility for mitigation. Fortunately, the incidence of such outbreaks is quite low and usually localised. Few farmers reported constraints related to weather, such as drought (between 0 and 5%), excessive rain (between 0 and 8%), and hailstorms (between 0 and 2%). Excessive rain occasionally destroys paddy when it falls during the harvest season; similarly hail can destroy horticultural tree crops when it falls during the flowering stage.

Table G.1

District	Wild Animals	Pests & Diseases	Drought	Excessive Rain	Hailstorms	District	Wild Animals	Pests & Diseases	Drought	Excessive Rain	Hailstorms
Bumthang	72	0	0	0	0	Tsirang	44	1	0	1	0
Ha	67	4	1	4	1	Dagana	35	0	0	0	0
Pemagatshel	63	3	3	2	0	Gasa	34	6	1	0	0
Trongsa	60	2	1	1	0	Trashigang	34	3	3	5	2
Trashigang	57	0	0	0	0	Punakha	32	5	0	0	0
Trashigang	55	2	1	3	0	Sarpang	32	3	1	3	0
Mongar	51	3	5	5	2	Chhukha	31	6	2	8	1
S/Jongkhar	50	3	1	2	1	Paro	28	8	1	1	0
Lhuntse	48	2	1	5	0	Samtse	27	4	2	5	1
Wangdue	45	0	0	0	0	Thimphu	21	10	1	1	1
						Average*	41.9	3.6	1.7	3.3	0.7
* Simple averages, not weighted											

Farm Households Reporting Constraints Affecting Crop Production

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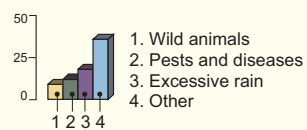
% of HHs affected by wild animals

- Above 60
- 51 - 60
- 41 - 50
- 31 - 40
- Up to 30

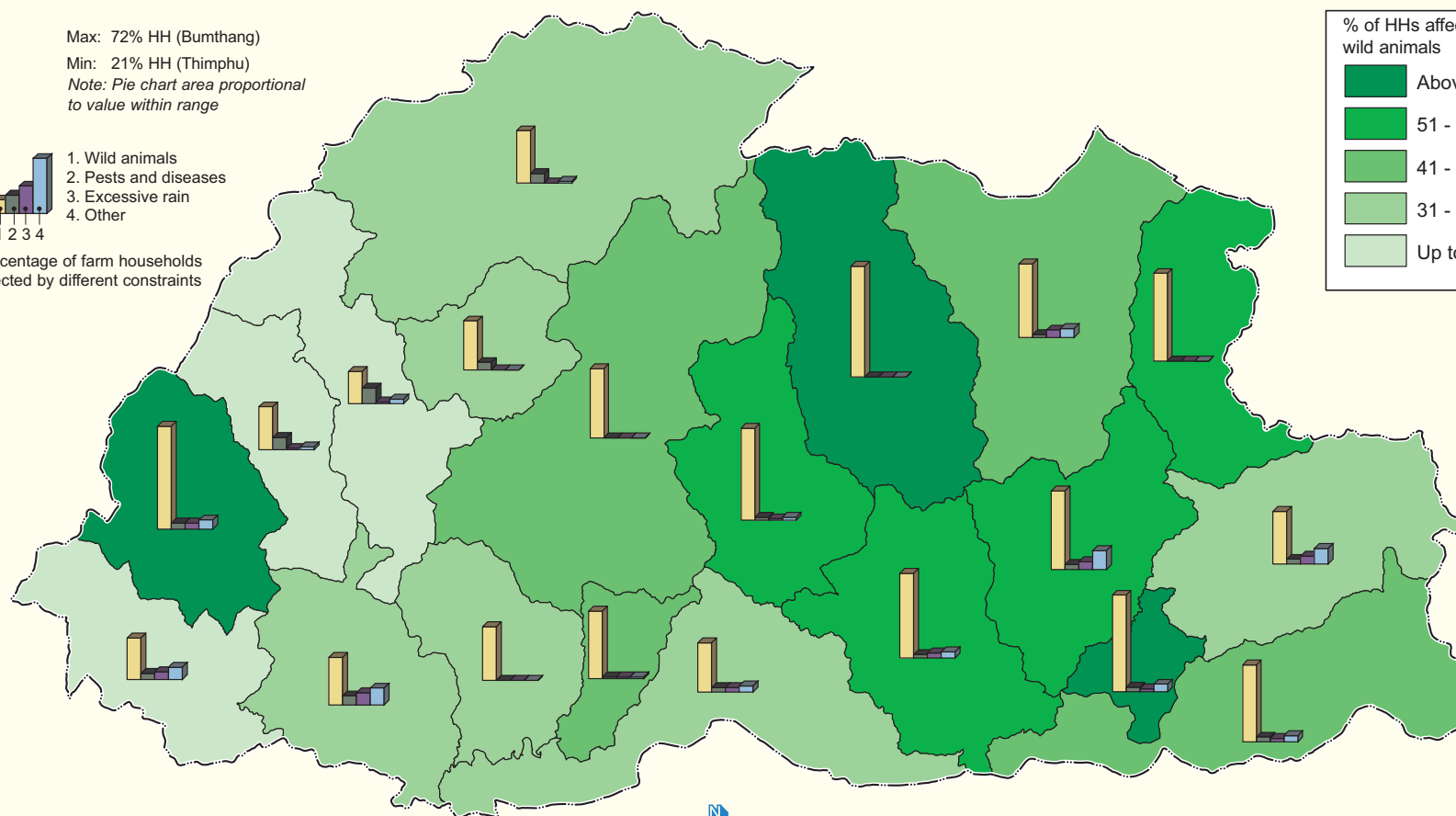
Max: 72% HH (Bumthang)

Min: 21% HH (Thimphu)

Note: Pie chart area proportional to value within range



Percentage of farm households affected by different constraints



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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Animal Damage by Type of Animal

Table G.2 shows the proportion of reported damage attributed to wild boar, deer, and other animals (bears, monkeys, elephants, porcupines, and others) in each district (percentage of all households reporting crop damage who reported damage by different types of animal). The map shows the districts ranked according to the total percentage of damage attributed to wild boar. The superimposed pie charts show the relative proportions of damage attributed to different animals, and indicate differences in the percentage attributed to wild boar in the different districts.

Wild boar was the single most commonly reported cause of damage, responsible for 23% (Samtse) to 63% (Punakha) of damage reports in the different districts. Deer were responsible for 16% (Samtse) to 34% (Paro) of all reports, with other animals, especially monkeys and bears, being cited in 15 to 61% of all cases. Damage by elephants was confined to a few districts in the south. There were also reports of porcupines causing damage.

Table G.2

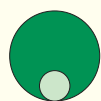
District	Wild Boar	Deer	Other	District	Wild Boar	Deer	Other
Punakha	63	23	16	Mongar	38	18	43
Bumthang	61	19	20	Zhemgang	37	22	41
Wangdue	53	32	15	Trashigang	34	24	42
Paro	48	34	17	S/Jongkhar	34	18	49
Trongsa	47	22	31	Sarpang	33	18	49
Thimphu	45	32	23	Lhuntse	33	17	50
Ha	45	31	23	Pemagatshel	33	24	42
Gasa	43	23	34	Chhukha	29	23	48
Dagana	38	24	47	Samtse	23	16	61
				Average*	36.7	21.6	41.8
* Simple averages, not weighted							

Animal Damage by Type of Animal

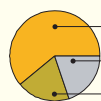
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% damage attributed to wild boar

- Above 60
- 51 - 60
- 41 - 50
- 31 - 40
- Up to 30

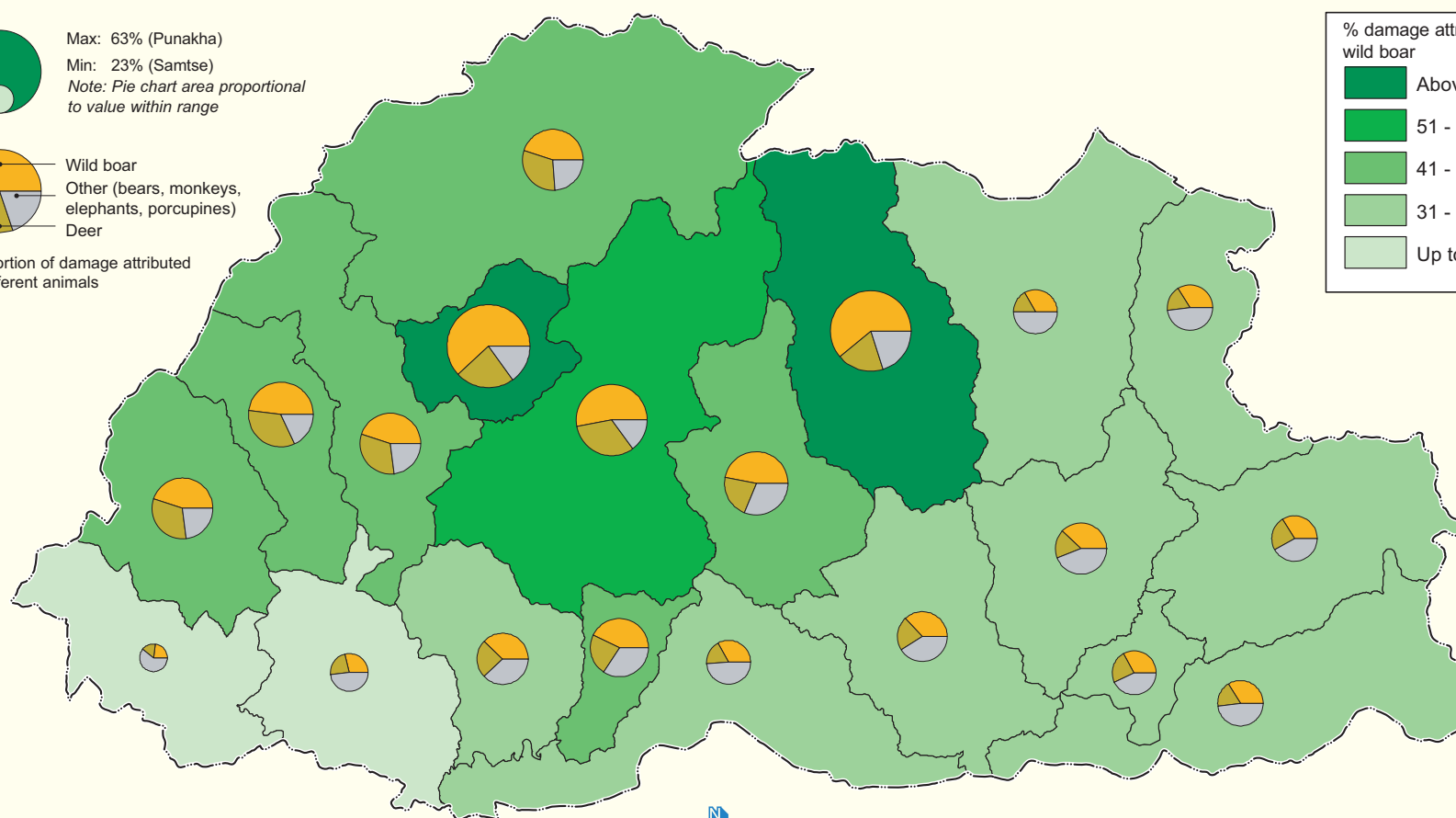


Max: 63% (Punakha)
Min: 23% (Samtse)
Note: Pie chart area proportional to value within range



Wild boar
Other (bears, monkeys, elephants, porcupines)
Deer

Proportion of damage attributed to different animals



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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Percentage of Farm Households Reporting General Constraints

Farmers also face other more general constraints. One is poor irrigation facilities or (often) no irrigation facilities at all. This problem is most acute in the paddy growing districts where the number of farm households is high. Labour shortages, caused mainly by the recent trend in rural-urban migration, are also increasingly a constraint for farmers, as is lack of agricultural land. Farmers with excess crops which could be sold face the constraint of limited access to markets, mainly because of inadequate roads

Table G1 shows the percentage of households affected by general constraints of different types in 2000 in each district, listed in order of the percentage facing problems as a result of lack of an irrigation supply. The map shows the districts ranked according to the total percentage of houses affected by lack of irrigation. The superimposed bar charts show the percentage of households that cited different constraints.

The most commonly cited constraint faced by farm households was lack of an irrigation supply, with up to 40% of farm households (Sarpang) experiencing the problem. Labour shortages (maximum 14% in Gasa, Punakha, and Trashigang) and land shortages (maximum 15% in Samtse) were the next most common problems, with limited market access less prominent (maximum 10% of households in Trashigang and Samdrup Jongkha). None of the farm households in Bumthang, Dagana, Trashy Yangtse, and Wangdue districts reported any of these constraints.

Table G.3

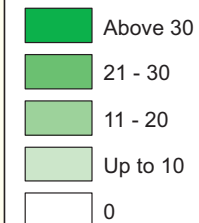
District	Lack of Irrigation Supply	Labour Shortage	Land Shortage	Limited Market Access	District	Lack of Irrigation Supply	Labour Shortage	Land Shortage	Limited Market Access
Sarpang	40	5	10	2	Trongsa	12	13	5	2
Samtse	33	5	15	5	Mongar	11	10	4	5
Tsirang	30	5	11	4	Trashigang	11	14	7	10
Paro	29	13	13	1	Gasa	9	14	8	4
Punakha	26	14	13	4	Ha	7	6	4	4
Chhukha	25	5	11	7	Pemagatshel	3	13	4	3
Lhuntse	24	9	3	1	Wangdue	0	0	0	0
Zhemgang	20	9	2	4	Dagana	0	0	0	0
S/Jongkhar	15	8	5	10	Trashy Yangtse	0	0	0	0
Thimphu	13	11	12	2	Bumthang	0	0	0	0
					Average*	20.6	9.6	8.1	5.2
* Simple averages, not weighted									

Percentage of Farm Households Reporting General Constraints

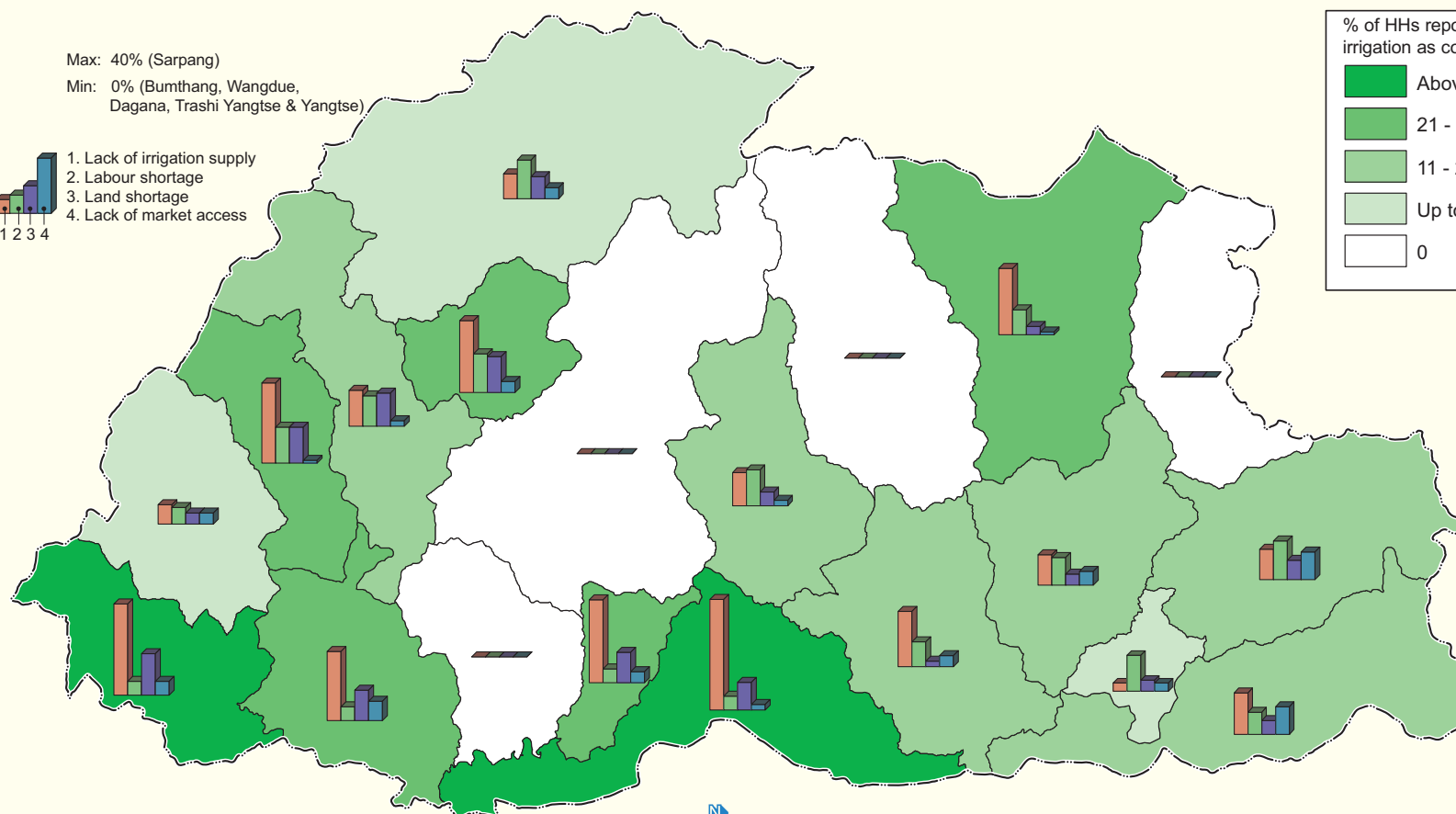
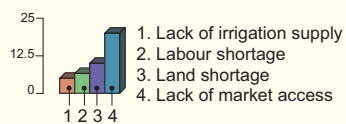


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% of HHs reporting lack of irrigation as constraint



Max: 40% (Sarpang)
Min: 0% (Bumthang, Wangdue, Dagana, Trashi Yangtse & Yangtse)



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 Distance (Walking Time) to the Nearest Motorable Road

Many farm households are still located more than a day's walk from the nearest roadhead. However, the government is dedicated to improving market accessibility by improving the road network, and to improving rural connectivity by constructing farm roads. Given the current rate of construction, the situation is expected to change rapidly.

Table G.4 shows the percentage of farm households in 2000 in each district located less than 3 hours, between 3 and 8 hours, and more than 8 hours walking time from the nearest motorable road, listed in order of the percentage of households more than 8 hours from a road. The map shows the districts ranked according to the total percentage of households more than 8 hours from a road, together with the existing road network. The superimposed pie charts show the percentage of households living at different distances from a road.

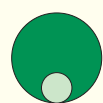
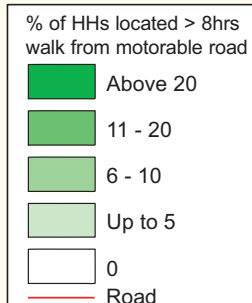
Two districts, Gasa and Zhemgang had nearly 60% of households living more than 8 hours walk from the next road; in contrast the proportion was 10% or less in 13 districts, with no households this far from a road in Punakha, Tsirang, or Bumthang. In Bumthang, Punakha, and Paro, 98% of households were located less than three hours walk from a road point.

Table G.4

District	< 3 hrs	3-8 hrs	> 8 hrs	District	< 3 hrs	3-8hrs	> 8 hrs
Gasa	30	12	58	Thimphu	93	1	6
Zhemgang	28	16	56	Mongar	64	31	5
Lhuntse	54	27	19	Dagana	81	17	2
Ha	80	2	18	Trongsa	82	16	2
Pemagatshel	51	32	17	Paro	98	1	1
Samtse	67	18	15	Wangdue	87	12	1
S/Jongkhar	45	40	15	Trashigang	74	25	1
Chhukha	67	23	10	Punakha	98	2	0
Sarpang	85	7	8	Tsirang	89	11	0
Yangtse	74	19	7	Bumthang	98	2	0
				Average*	71	19	10.4
* Simple averages, not weighted							

Farm Households by Distance (Walking Time) to the Nearest Motorable Road

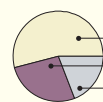
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Max: 58% (Gasa)

Min: None (Punakha, Tsirang & Bumthang)

Note: Pie chart area proportional to value within range

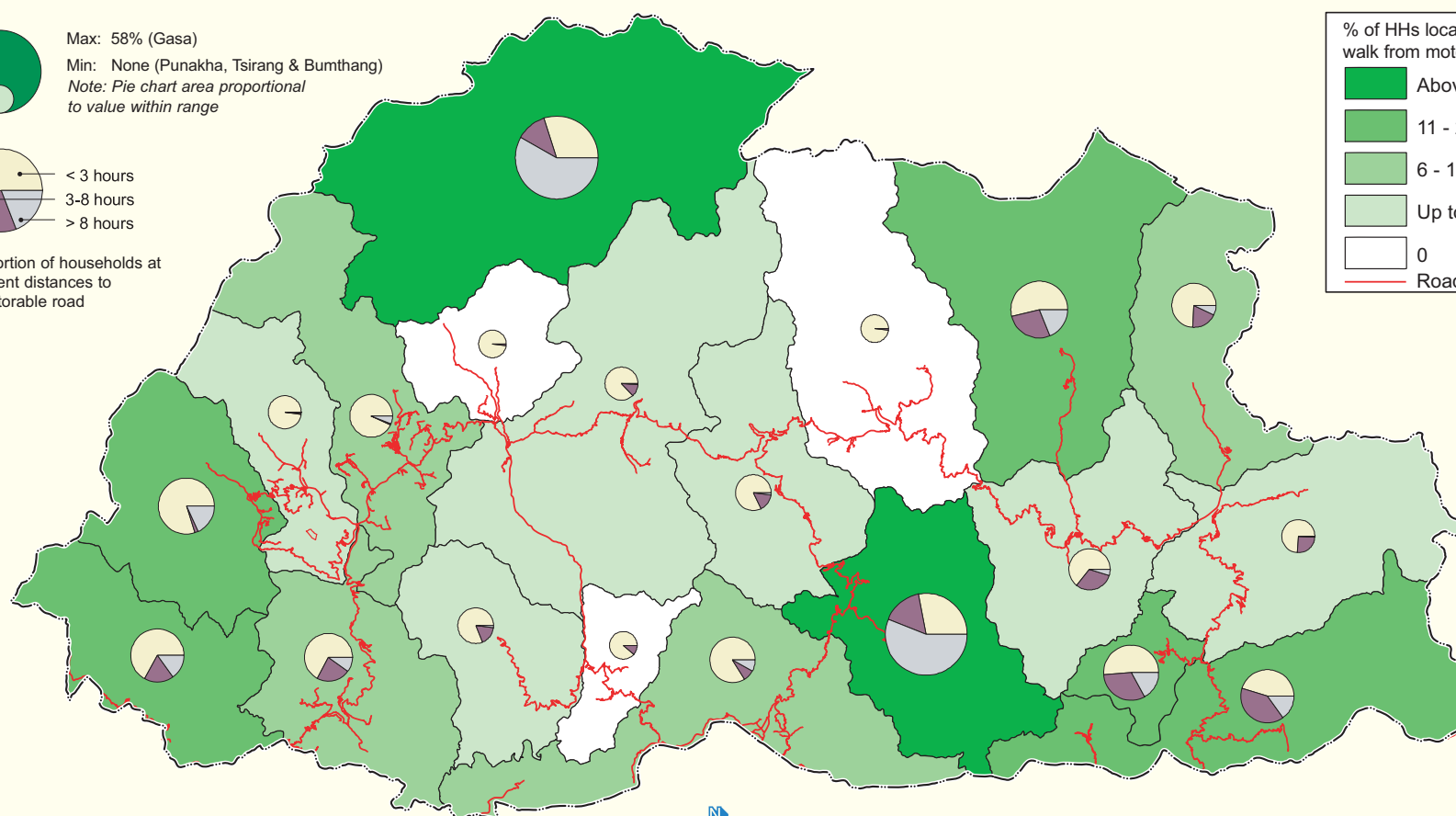


< 3 hours

3-8 hours

> 8 hours

Proportion of households at different distances to a motorable road



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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