

3 Haa

Haa Dzongkhag lies along the western border of Bhutan. To the north, it is surrounded by the Tibetan Autonomous Region of China. To the southwest, it is bordered by the Dzongkhag of Samtse, to the southeast by Chhukha and to the east by Paro Dzongkhag.

Haa Dzongkhag consists of five gewogs namely Bji, Katsho, Sama, Sangbay and Uesu with an area of 1,706.8 sq. km. As per the new political demarcation of gewogs, an additional gewog named Gakidling has been added within the Dzongkhag boundary, raising the total gewogs to 6. It is characterized by a rugged and mountainous terrain, which makes access and delivery of development services difficult as well as expensive. The Dzongkhag has a total of about 1,137 households.

Most of the communities are remotely located from roads and towns and rather isolated due to lack of infrastructure.

The elevation in the Dzongkhag ranges from 1,000 to 5,600 meters above sea level. The population of Haa Dzongkhag is 11,648 as per country census 2005.

The 89 km of Haa-Chuzom and the 78-km Haa-Paro highways pass through the Dzongkhag but, with only about 44.10 km of internal road connections, most of the settlements are not connected with feeder and farm roads. It has a good network of mule tracks and suspension bridges.

3.1 Basic Infrastructure

a. Roads¹

Haa is well contacted with Paro and Thimphu. Now a road link to Samtse is under construction.

S. No.	Road Type	Km.
1	National Highway	16.25
2	District Road	25.60
3	Feeder Road	31.52

Table 3.1 (a) Roads -2005

b. Distances² to other Dzongkhags

S. No.	From	To	Distance (Km.)
1.	Haa	Thimphu	121
2.	Haa	Paro	78
3.	Haa	Wangdue	185
4.	Haa	Phuentsholing	223

Table 3.1 (b) Distances to other Dzongkhags

Source :

¹Department of Roads, Ministry of Works & Human Settlement, Bhutan.

²Road Safety & Transport Authority, MoIC, Bhutan.

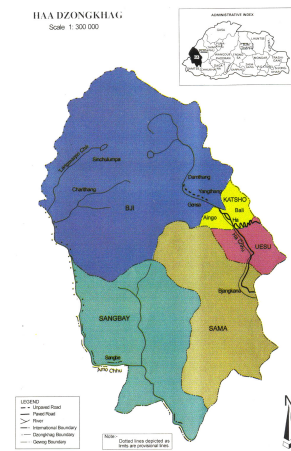


Figure 3.1 Haa Dzongkhag

c. Education¹

In Haa Dzongkhag, schools are viewed in proportion to its population.

S. No.	Type of Schools	Nos. (2006)
1.	Community School	2
2.	Primary School	3
3.	Lower Secondary School	3
4.	Middle Secondary School	0
5.	Higher Secondary School	1

Table.3.1 (c) Type of Schools -2006

d. Health Facilities²

The Dzongkhag does not have a full-fledged hospital. Health services are provided by four BHUs and the IMTRAT hospital.

S. No.	Facilities	Nos. (2005)
1.	Hospital	1
2.	BHUs	4
3.	ORCs	12

Table 3.1 (d) Health Facilities -2005

e. Telecommunication

Haa has relatively good telecommunication services.

S. No	Details	Nos. (2005)
1.	Number of Telephone lines	660
2.	Telephone lines connection Capacity (DRMASS)	734

Table.3.1 (e) Telecommunication

f. Type of Land

As per the Department of Agriculture survey 2005, the following is the type of land distribution in the Dzongkhag:

S. No.	Type of Land	Area in Acres (2005)
1.	Wet-Land	111
2.	Dry -Land	2190
3.	Tseri / Pangshing	1065
4.	Orchard	67

Table 3.1 (f) Type of Land

3.2 Trade & Industry³

In all, 94 retail and 3 dealership licences, 23 production and manufacturing licences (10 for small and 13 for cottage industry) and 93 service licences were issued as of end of 2005, in the business sector.

Source :

1General Statistics 2006-Year Book, Department of School Education, Ministry of Education, Bhutan.

2Statistical & Planning Officers, Dzongkhag Administration- Haa.

3Industrial Licensing and Monitoring Division , Department of Industry, MoEA, Bhutan.

Available Resources:

3.3 Agriculture¹

The Dzongkhag is constrained by short growing seasons and limited arable land, as only about two percent of the land is cultivable. Wheat is the main cereal crop grown in most of the gewogs although a variety of other dry land crops such as barley and buckwheat are also grown.

a. Crops Production (Production in Metric Ton)

S. No.	Crops Gewogs	Paddy	Barley	Wheat	Sweet Buck Wheat	Mustard	Bean	Bitter Buck Wheat	Peas
1	Bji	00.00	24.34	140.57	14.65	00.00	5.08	20.99	21.65
2	Katsho	00.00	00.00	78.56	16.64	00.00	00.00	26.23	43.40
3	Sama	117.52	87.15	121.36	26.11	00.00	9.15	29.92	137.97
4	Sangbay	103.54	00.00	29.69	37.15	45.90	3.51	29.39	00.00
5	Uesu	00.00	00.00	62.60	23.25	22.93	00.00	25.45	129.60
Total Production (MT)		221.06	111.49	432.78	117.8	68.83	17.74	131.98	332.62

Table 3.3 (a) Crops Production -2005

b. Main Crop for Commercial Utilization (Production in Metric Ton)

S. No.	Crop	Production (MT)
1	Wheat	432.78

Table 3.3 (b) Main Crops for Commercial Utilization -2005

Analysis of Agriculture Produce

While wheat and barley could find market for processing, considering the consumption demand of the local population, the agriculture produces are not in surplus to plan any processing units for marketing/ exporting.

c. Livestock Population²

Following is the livestock population of Haa Dzongkhag:

S. No.	Type of Animal	Nos. (2005)
1.	Cattle	7373
2.	Jersey	1862
3.	Yak	1402
4.	Pig	195
5	Poultry	675

Table 3.3 (c) Livestock Population -2005

d. Livestock Products²

Milk, butter and cheese are the main livestock products.

S. No.	Product	Qty.
1	Milk (Lt.)	1409187
2.	Butter (Kg.)	46782
3.	Cheese (Ball)	18873

Table 3.3 (d) Livestock Products -2005

Analysis of Livestock Produce

Livestock and livestock products are in surplus (after considering 4,00,000 liters of milk for local consumption, there is surplus of approximately 10,00,000 liters) in the Dzongkhag. So there is good opportunity for processing unit and marketing the product to other Dzongkhags.

Source :

¹Agriculture Statistics-2005, Department of Agriculture, MoA & Dzongkhag Agriculture Officer, Dzongkhag Administration-Haa.

²Dzongkhag Livestock Officer, Dzongkhag Administration-Haa.

3.4 Horticulture¹

There are variety of fruits and vegetables grown in Haa. Potato, radish and turnip are the main vegetables and apple is the main fruit produced in sizable quantity.

a. Vegetable Production (Production in Metric Ton)

S. No.	Vegetables	Potato	Radish	Turnip	Cabbage	Chilli	Cardamom	Green Leaves
	Gewogs							
1	Bji	113.20	51.94	664.28	33.66	00.00	00.00	4.15
2	Katsho	261.08	14.65	678.86	21.26	00.00	00.00	4.65
3	Sama	456.99	40.98	310.27	00.00	21.82	47.43	3.25
4	Sangbay	5.01	8.14	7.84	00.00	7.88	00.00	4.52
5	Uesu	1399.95	390.73	550.54	00.00	30.77	00.00	00.00
Total Production (MT)		2236.23	506.44	2211.79	54.92	60.47	47.43	16.57

Table 3.4 (a) Vegetable Productions -2005

b. Fruit Production (Production in Metric Ton)

S. No.	Fruits	Apple
1	Bji	67.10
2	Katsho	180.37
3	Sama	116.88
4	Uesu	150.02
Total Production (MT)		514.37

Table 3.4 (b) Fruit Production -2005

Analysis of Horticultural Produce

The volumes of potato, radish, turnip and apple are in surplus and marketed outside the Dzongkhag. However, the quantity is not adequate for setting up processing units other than adding value to the product by cleaning, grading and packaging.

3.5 Wood²

There are 10 sawmills in the Dzongkhag. Timber demand & production potential are as given in the table below:

Production Potential				Demand	Difference Available Log (Cubic Meter)
Inside FMUs		Out side FMUs	Total		
Existing	Potential				
3351	4351	8695	16397	5830	10567

Table 3.5 Timber Demand & Production Potential (2005-2009)

The efficiency of the existing sawmills could be improved. Establishment of saw dust briquette making unit holds scope in view of the availability of saw dust from sawmills and cold climatic conditions requiring heating.

3.6 Non-wood Forest Resources³

a. Types of Edible Mushrooms available in Haa

S. No.	Scientific Name	Local Name	Usage
1	Auricularia auricular	Kaney/bajey kan/musa kaney/ rato kaney chaew,	Wild edible mushroom
2	Cantharellus	Kan-ney chaew, sisi shamu, seersi shamu (2 Types)	Wild edible mushroom

Table 3.6 Types of Edible Mushrooms

Analysis of Non-Wood Forest Resources

Mushrooms are highly valued in export markets and should be developed as an industry.

Source:

¹Agriculture Statistics-2005, Department of Agriculture, MoA & Dzongkhag Agriculture Officer, Dzongkhag Administration -Haa.

²Forestry Resources Development Division, Department of Forestry Services, Ministry of Agriculture, Bhutan.

³Non wood Forest Product" A report on Haa, Forest Resources Development Division, Department of Forestry Services, Ministry of Agriculture.

3.7 Tourism¹ – Haa

Existing	Potential
1. Attractions	
<ul style="list-style-type: none"> Haa Dzongkhag has many Lhakhangs mainly dedicated to Guru Rinpoche. Almost all the Lhakhangs are accessible by road except for a few Lhakhangs in Sangbe Gewog and Sama Gewog. Beautiful unique lakes in Sangbe Gewog. Haa Lomba and Bonko Festival. 	<ul style="list-style-type: none"> Haa La – Kyu La trek (6 days) and Haa – Sibsoo (15 days via Tarilla and Tsonapata Lakes; alpine, broad leaved and subtropical forest along the route). The old route from Haa to Paro has good views on the Jomolhari range and can make a beautiful short trek like the Druk path. Chuzum – Haa – Paro – Chuzum could be a great bicycling tour (great scenery along the route, great view from Cheli La, hardly any traffic).
2. Lodging Facilities	
No lodging facilities are available except for two hotels in Katsho Gewog (Haa town).	Due to the traditional lifestyle and architecture, Haa would have high potential to develop farmhouse stay.
3. Food Service Facilities	
Other than in Katsho Gewog the Dzongkhag does not have restaurants.	
4. Transportation and Access	
Only the communities in Katsho gewog are accessible by road. Other Gewogs have no road connection.	
5. Other Public Services/ Facilities	
Hospital in Haa town, BHU in Katsho and Uesu Gewog, provide medical services. However, Sangbay and Sama Gewog do not have such facilities.	

Table 3.7 Tourism Haa

Haa can be warm and muggy in summer and cold in winter. Only spring and autumn are suitable for trekking. Highest potential for tourism development in Haa could be “farmhouse” stay.

3.8 Minerals²

3.8.1 Resource data

a. Graphite

S. No.	Topic	Details
1	Description	Graphite occurs as three bands at the Khepchisi hill of the Chilaila area at 3900 m above msl. It occurs as cryptocrystalline mass and flaky aggregate. Beneficiation tests were done by National Metallurgical Ltd., Jamshedpur and Patna Estate Graphite Corporation, Orissa. NML’s test results was not encouraging but the Graphite Corporation results showed that the ore could be beneficiated to 90% F.C. Similar tests by Austroplan also indicated that the ore could be beneficiated to the same level.
2	Reserves	A total reserve of 53.74 mio tons is estimated with 10 to 20% non-carbonate carbon, traces to 3% carbonate carbon and 70 to 85% ash content.
3	Exploitation	Pre-feasibility studies for mining was undertaken for a period of four months in 1988.
4	Existing/Potential Enterprises	Graphite is used in brake lining, crucibles, foundry facings, pencils and well drilling fluids. Most uses are in highly sophisticated industries, which are far away from Bhutan. This may offer opportunity for FDI projects at a later stage.

Table 3.8.1 (a) Graphite

Source:

¹Tourism Resources Inventory of Bhutan, Volume I & II August 15, 2005 & Bhutan Land of the Thunder Dragon -2005, Department of Tourism.

²(a) The Bhutan Himalaya: A Geological Account- Special Publication 39, Edited by O.N. Bhargava, Geological Survey of India, 1995.

(b) Atlas of Mineral Resources of the ESCAP Region, Vol. - 8, Bhutan – UN ESCAP and Department of Geology & Mines of Bhutan, 1991.

(c) Department of Geology & Mines, Ministry of Economic Affairs, Thimphu.

b. Limestone at Haa Wangcha & Chilungkha

S. No.	Topic	Details
1	Description	Bedded crystalline limestone occurs in the Shumar formation. (a) At Haa Wangcha. Detail exploration discontinued. (b) At Chilungkha, detailed work completed.
2	Reserves	(a) Wangcha- Probable reserve of 5 mio tons with CaO 52% & MgO 2%. (b) Chilungkha – Probable reserve of 0.447 mio tons with CaO 52.5%.
3	Exploitation	None
4	Existing/Potential Enterprises	High-grade limestone but crystalline and physical characteristics not fit for use in calcium carbide manufacture.

Table 3.8.1 (b) Limestone at Haa Wangcha & Chilungkha

c. Marble

S. No.	Topic	Details
1	Description	Marble occurs at Chilungkha associated with the limestone in the Shumar formation of the area.
2	Reserves	N.A.
3	Exploitation	None
4	Existing/Potential Enterprises	Small quantity

Table 3.8.1 (c) Marble

d. Lead-Zinc (Sporadic mineralization)

S. No.	Topic	Details
1	Description	Sporadic and pockety mineralization of lead-zinc was found in two zones located about 2 km due west of Haa Dzong. Mineralization is found in the Paro/Shumar formation of the area, which is widespread in the Haa-Paro-Thimphu region.
2	Existing/Potential Enterprises	Detail study found the occurrence limited in extent. Recommendation given is for searching the minerals in other areas of the region.

Table 3.8.1 (d) Lead-Zinc (sporadic mineralization)

3.8.2 Recommended for Consideration**1. Limestone at Wangcha**

This limestone is of high grade and the quantity can be assessed and suitability studied for use in the manufacture of precipitated calcium carbonate and hydrated lime.

3.9 SWOT Analysis

<p style="text-align: center;">Strengths</p> <ol style="list-style-type: none"> Unexplored and virgin area recently opened for visitors Beautiful natural surroundings and dense forest Accessible to China through Tibet. Reasonable good infrastructure & road connectivity RNR Extension Centre 	<p style="text-align: center;">Weaknesses</p> <ol style="list-style-type: none"> Wholesale trade is managed from Paro Small population Economic activity restricted to saw-milling and small retail trade. Low population to support development Institutional support for micro enterprises, finance non existent
<p style="text-align: center;">Opportunities</p> <ol style="list-style-type: none"> Excellent potential for organic cultivation Tourism potential for development of natural springs Good potential for milk processing Potential for higher education centre Ideal for bio-technology & IT center Potential for mineral /spring water. 	<p style="text-align: center;">Threats</p> <ol style="list-style-type: none"> Cheap products from China can discourage local production

Table 3.9 SWOT Analysis

3.10 Need for Government Support

- a. This Dzongkhag has investment development potential, as there is entrepreneurship zeal among the local inhabitants. It requires supporting infrastructure like connectivity with other developed Dzongkhags, Internet connectivity, business facilitation centre, vocational training institutes and other modern amenities. The Government could consider declaring the Dzongkhag as a special development zone and provide special incentives for investments in the Dzongkhag.
- b. There are 10 small scale saw milling units in the Dzongkhag, the saw dust from which is lying as waste and creating environment hazards. So there is strong need to study the feasibility of forming saw mill cluster to facilitate the technical support, availability of skilled man power, effluent disposal and setting up of saw dust briquetting plant common for all units.
- c. The horticulture and livestock produce are in surplus beyond the local consumption. As such, Government can support setting up of a collection centre for inter-Dzongkhag trade of these products.

3.11 Investment Opportunity Ideas

Based on the analysis of the resources of the Dzongkhag, the following activities are perceived as potential business activities. However, interested investors are advised to undertake detailed project studies before making investment.

a. Trade

- Retail trade
- Souvenir shops

b. Manufacturing

- Dairy plant
- Sawdust briquette unit
- Mineral water / spring water bottling plant
- Graphite mining
- Marble mining
- Yak meat drying and packaging

c. Services

- Standard hotel/restaurants
- Development of caves and wildlife tourism
- Potato/Sweet buckwheat/bitter buckwheat collection center
- Farm house

4 Samtse

Samtse Dzongkhag has an area of about 1,582 sq. km. with elevation ranging from 600m to 3800m above sea level. It had two Drungkhags and 16 gewogs viz Bara, Biru, Chorghary, Chengmari, Denchukha, Dorokha, Duntsoe, Ugyentse, Yoeseltse, Mayona, Namgaye Chholing, Pugli, Samtse, Sipsu, Tading and Tendu with 6,128 households. Now as per the new demarcation of political boundaries, Mayona and Namgaye Chholing have been merged into a new gewog, Lahireni, as per information available on date, thus, reducing the total to 15 gewogs. Majority of the gewogs are located at the foothills bordering the Indian State of West Bengal.. Close proximity to markets in India offer excellent opportunity for horticultural development on a commercial scale. Mandarin orange, cardamom, ginger and areca nut are grown widely for cash income.

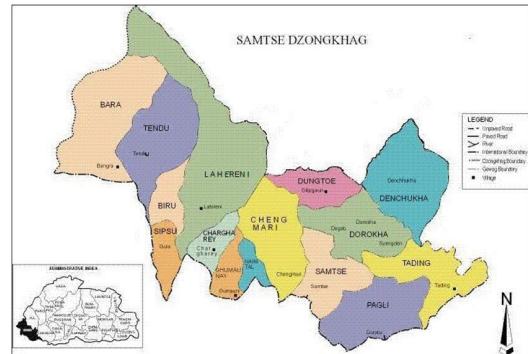


Figure 4.1: Samtse Dzongkhag

Favorable terrain and fertile agricultural land contributes higher productivity in the foothills. Though largely rain fed, paddy and other cereal productions are the main crops and yields are high. It is endowed with rich mineral deposits and major mining and mineral-based industries are located in the Dzongkhag

Gewogs in the northern part of the Dzongkhag are relatively poor and underdeveloped. Landholdings are small and source of cash income is limited. Denchukha, Dorokha, Duntsoe and Mayona gewogs are remote and remain inaccessible by motorable roads. Settlements in these gewogs are scattered with difficult land terrain, which make delivery of services difficult and costly..

Good water supply is available in this Dzongkhag. Over 60 percent of the population has access to piped drinking water supply. The population of Samtse Dzongkhag is 60,100 as per Bhutan census 2005.

4.1 Basic Infrastructure

a. Roads¹

There is no connection by road from Samtse town to Phuentsholing or other Bhutanese towns, except via the Indian National Highway NH 31C. Now a road link to Haa is under construction. Following table describes the road network of Samtse.

S. No.	Road Type	Km.
1	District Road	89
2	Feeder Road	25.60

Table 4.1 (a) Roads -2005

b. Distances² to other Dzongkhags

S. No.	From	To	Distance (Km.)
1	Samtse	Thimphu	245
2	Samtse	Tendu	75
3	Samtse	Phuentsholing	74
4	Samtse (Gomtu)	Phuentsholing	67
5	Samtse	Chorgharey	38

Table 4.1 (b) Distances to other Dzongkhags

Source:

¹Department of Roads, Ministry of Works & Human Settlement, Bhutan.

²Road Safety & Transport Authority, MoIC, Bhutan.

c. Education¹

Samtse Dzongkhag has following education facilities.

S. No.	Type of Schools	Nos. (2006)
1	Community Primary School	7
2	Primary School	4
3	Lower Secondary School	3
4	Middle Secondary School	2
5	Higher Secondary School	1

Table 4.1 (c) Type of Schools -2006

d. Health Facilities²

The coverage of health facilities is viewed satisfactory. These include the following.

S. No.	Health Facilities	Nos. (2005)
1	Number of Hospitals	3
2	Number of BHU's	8
3	Number of ORC with shed	16

Table 4.1 (d) Health Facilities -2005

e. Postal & Telecommunication

The Dzongkhag has poor postal & telecommunication services wherein only about 16% of the population has access to telephone lines. Postal facilities consist of 4 post offices, 6 community mail agents and 5 wireless stations.

f. Electricity

S. No.	Electricity	Nos. (2005)
1	Households with Electricity Supply	2844
2	Households with Solar Supply	42

Table 4.1 (e) Electricity Supply

g. Water Supply

Over 60 percent of the population has access to piped drinking water supply.

S. No.	Water Supply Scheme	Nos. (2005)
1	Rural Water Supply Schemes	136

Table 4.1 (f) Water Supply-2005

h. Type of land

As per the Department of Agriculture survey 2005, the following is the type of land distribution in the Dzongkhag.

S. No.	Type of Land (AC)	Area in Acres (2005)
1	Wet-Land	9604
2	Dry-Land	15257
3	Tsheri/Pangshing	13997

Table 4.1 (g) Type of Land

4.2 Trade & Industry³

There were in total 641 trade licences issued (615 for retail and 9 for dealership). 47 production and manufacturing licences were issued out of which 13 are for agro-based and 8 are for forest-based industries. In services sector, 234 licences were issued out of which 203 were cottage scale and 31 small scale activities as of 31.12.2005. Penden Cement Authority Ltd., Yangzom Cement Industry Ltd., Lhaki Cement Pvt. Ltd., Bhutan Fruit Products Ltd. and Bhutan Polymers Co. Ltd. are the main manufacturing industries in Samtse.

Gomtu and Samtse towns are industrial centres in the Dzongkhag. Close to Samtse town an industrial estate namely Damdhum Industrial Estate is planned for development. The total area of the estate is 565 acres situated within 3 km of Samtse town, and the feasibility study of the same has been completed. When commissioned, this estate will be the closest to Indian markets.

Source:

¹General Statistics 2006-Year Book, Department of School Education, Ministry of Education, Bhutan.

²Statistical & Planning Officers, Dzongkhag Administration-Samtse.

³Industrial Licensing and Monitoring Division, Department of Industry, MoEA, Bhutan.

Available Resource:**4.3 Agriculture¹**

Owing to favorable terrain and fertile agricultural land a number of crops and cereals are cultivated. The table below illustrates the production of different crops in the Dzongkhag.

a. Crops Production (Production in Metric Ton)

S. No.	Crops	Paddy	Maize	Wheat	Finger Millet	Bean	Sweat Buck Wheat	Mustard	Soya Bean
	Gewogs								
1	Bangra	462.29	783.30	00.00	44.26	5.64	15.68	91.87	4.93
2	Biru	774.92	1423.17	210.23	172.24	14.83	00.00	100.54	8.51
3	Charghary	1518.10	00.00	31.03	70.43	11.16	00.00	45.25	5.82
4	Chengmari	805.35	911.53	312.86	156.73	00.00	00.00	49.26	00.00
5	Denchukha	287.21	344.87	00.00	29.18	2.13	9.13	00.00	00.00
6	Dorokha	578.15	672.30	33.84	82.47	3.13	8.98	00.00	9.24
7	Dungtoe	195.34	1724.02	00.00	28.61	10.07	00.00	00.00	00.00
8	Mayona	626.84	798.17	00.00	35.88	8.97	00.00	00.00	00.00
9	Namgaye	487.99	1100.80	52.82	133.59	00.00	7.93	12.68	00.00
10	Pagli	130.07	1006.15	00.00	68.94	6.23	9.53	26.78	5.57
11	Samtse	335.17	447.17	00.00	51.81	6.49	00.00	19.50	00.00
12	Sipsu	792.34	620.59	00.00	94.83	00.00	10.86	10.51	00.00
13	Tading	373.06	1087.73	73.87	136.59	21.72	43.10	54.04	00.00
14	Tendu	295.13	784.66	00.00	32.16	00.00	8.07	9.49	00.00
15	Ugyentse	824.90	1018.18	00.00	111.16	00.00	00.00	00.00	00.00
16	Yoeseltse	913.64	924.51	95.05	84.89	00.00	00.00	00.00	00.00
Total Production(MT)		9400.50	13647.15	809.70	1333.77	90.37	113.28	419.92	34.07

Table 4.3 (a) Crop Production -2005

b. Main Crops for Commercial Utilization (Production in Metric Ton)

S. No.	Crops	Production (MT)
1	Paddy	9400.50
2	Maize	13647.15

Table 4.3 (b) Main Crops for Commercial Utilization -2005

Paddy and maize are the main commercial crops. Approximately 6000 MT of paddy and 8000 MT of maize are estimated to be surplus after meeting local consumption.

c. Livestock Population²

Following were the main livestock population in the Dzongkhag.

S. No.	Livestock	Nos. (2005)
1	Cattle	30694
2	Jersey	1514
3	Pig	109
4	Poultry	3468

Table 4.3 (c) Livestock Population -2005

Source:

¹ Agriculture Statistics-2005, Department of Agriculture, MoA & Dzongkhag Agriculture Officer, Dzongkhag Administration - Samtse.

²Dzongkhag Livestock Officer, Dzongkhag Administration -Samtse.

d. Livestock Products¹

Milk, butter and cheese are the main Livestock products in Samtse.

S. No.	Livestock Product	Qty.
1	Milk (lt.)	492344
2	Butter (kg)	36247
3	Cheese (ball)	188535

Table 4.3 (d) Livestock Products -2005

Analysis of the Livestock Produce

The cattle population in the Dzongkhag is high but the yield per animal is low. However, due to relatively less consumption of butter and cheese by the local inhabitants, most of livestock products are marketed to other Dzongkhags. The Dzongkhag is an excellent place for developing dairies, piggeries and poultry farms.

4.4 Horticulture²

There are varieties of fruit and vegetables grown in Samtse. Potato, ginger, cardamom and citrus are the main products for commercial utilization.

a. Vegetable Production (Production in Metric Ton)

S. No.	Vegetables						
	Gewogs	Potato	Ginger	Squash	Green Leaves	Cardamom	Radish
1	Bangra	257.99	173.46	20.37	8.49	34.26	34.63
2	Biru	199.79	156.13	89.16	49.72	66.79	115.75
3	Chargharay	42.29	80.78	00.00	9.57	00.00	23.08
4	Chengmari	52.13	333.30	00.00	19.88	00.00	18.15
5	Denchhukha	16.22	9.26	4.18	9.70	19.56	4.21
6	Dorokha	38.12	13.41	47.79	7.31	206.58	12.15
7	Dungtoe	00.00	3.35	00.00	7.42	19.93	4.16
8	Mayona	41.10	8.76	10.38	11.87	16.45	16.90
9	Namgaye Chholing	113.88	172.55	28.60	10.52	137.27	10.82
10	Pagli	97.69	00.00	19.77	5.87	00.00	26.41
11	Samtse	28.57	17.46	00.00	24.81	00.00	20.97
12	Sipsu	38.43	48.84	00.00	14.62	00.00	00.00
13	Tading	152.50	81.87	34.09	30.23	77.12	00.00
14	Tendu	00.00	33.40	3.53	14.16	150.28	00.00
15	Ugyentse	00.00	35.93	00.00	25.90	00.00	00.00
16	Yoeseltse	00.00	238.82	00.00	17.81	00.00	93.74
Total Production(MT)		1078.71	1407.32	257.87	267.88	728.24	380.97

Table 4.4 (a) Vegetable Production -2005

b. Main Vegetables for Commercial Utilization (Production in Metric Ton)

S. No.	Vegetables	Production (MT)
1	Potato	1078.71
2	Ginger	1407.32
3	Cardamom	728.24

Table 4.4 (b) Main Vegetables for Commercial Utilization -2005

Source:

¹Dzongkhag Livestock Officer, Dzongkhag Administration -Samtse.

²Agriculture Statistics-2005, Department of Agriculture, MoA & Dzongkhag Agriculture Officer, Dzongkhag Administration -Samtse.

c. Fruit Production (Production in Metric Ton)

S. No.	Fruit		Mandarin	Areca nut	Banana
	Gewogs				
1	Biru		717.07	115.68	25.70
2	Chengmari		00.00	00.00	00.00
3	Denchhukha		250.59	00.00	9.29
4	Dorokha		148.47	00.00	19.95
5	Dungtoe		00.00	00.00	00.00
6	Namgaye Chholing		94.97	124.65	24.20
7	Pagli		141.48	35.00	35.53
8	Samtse		00.00	262.66	32.44
9	Tading		828.91	482.77	25.54
Total Production (MT)			2181.49	1020.76	172.65

Table 4.4 (c) Fruit Production -2005

Analysis of the Horticulture Produce

The data shows that ginger, potato and cardamom have good potential for processing and trade. Among the fruits grown, orange (Mandarin) and areca nut have potential for processing.

4.5 Wood¹

Timber demand & production potential are as given in the table below:

Production Potential			Demand	Difference Available Log (Cubic Meter)
Inside FMUs	Out side FMUs			
Existing	Potential			
0	935	22485	2243	21177
Total				

Table 4.5 Timber Demand & Production Potential (2005-2009)

Analysis of Wood Produce

There is wood availability, which may be utilized for export, but is presently used up in the other Dzongkhags with larger construction requirements.

4.6 Non-wood Forest Resources²**a. Types of Bamboo available**

S. No.	Scientific Name	Local Name	Usage	Distribution within Samtse
1	Arundinaria maling	Malingo, maling, lamphay	Bamboo. Young shoots are used as vegetable	Bara-Assamtsha-Mukhiney, Biru-Jamirkota, Lahareni, Tendu, Denchhukha-Mayna-Boribotay, Dumtoe-Gairigaon Chegmari-Dipu-jhora-Dhaper-Tenteray, Chargharey, Namselling-Sombek-Chungthung.
2	Arundinaria sp.	Karay malingo	Bamboo	Bara-Assamtsha-Mukhiney
3	Arundinaria sp.	Negalo / negala	Bamboo	Biru-Jamirkota, Lahareni, Dorokha Maneygaon (rare), Tading, Samtse Buduney, Chegmari-Dipu-jhora-Dhaper-Tenteray, , Chargharey-Sombek Chungthung.
4	Bambus calvata	Chiley bans, jhushing	Useful Bamboo	Denchhukha, Mayna-Boribotay, Chegmari-Dipu-jhora-Dhaper-Tenteray, Ghumauney-Lamitar-Ghalleygaon, Chargharey-Namselling.

Source:

¹Forestry Resources Development Division, Department of Forestry Services, Ministry of Agriculture, Bhutan.

²"Non-wood Forest Product" A report on Samtse, Forest Resources Development, Division Department of Forestry Services, MoA-Thimphu.

S. No.	Scientific Name	Local Name	Usage	Distribution within Samtse
5	Bambus nutans	Mal / mali /mola / mala /maley bans	Bamboo (Leaves are used as fodder)	Found throughout Samtse
6	Bambus sp.	Dhanu / ban bans, jhushing	Bamboo	
7	Cephalostachyum sp.	Gopay, lokpa	Bamboo	Bara-Assamtsha-Mukhiney, Denchhukha-Mayna-Boribotay ,Dumtoe-Gairigaon, Dorokha-Maneygaon, Pugli-Gheesinggaon, Tading, Chegmari-Dipu-jhora-Dhaper-Tenteray, Ghumauney-Lamitar-Ghalleygaon , Chargharey, Namselling-Sombek-Chungthung
8	Dendrocalamus hamiltonii	Choya / jungali / ban bans, pakshi / pagshi	Bamboo (Leaves are used as fodder, shoot-vegetable as well as preserve and make as pickle), split bamboo used to make rope. Sometimes the seed are used to produce flour that is consumed.	Found throughout Samtse
9	Dendrocalamus hookeri	Bhalu / kalo bans, pakshing	Bamboo, leaves are used as fodder.	Bara-Assamtsha-Mukhiney, Sipsu-Kotigaon, Tendu, Denchhukha-Mayna-Boribotay ,Dumtoe-Gairigaon, Dorokha-Maneygaon, Pugli- Gheesinggaon, Tading, Samtse- Buduney, Chegmari-Dipu-jhora-Dhaper-Tenteray, Ghumauney-Lamitar-Ghalleygaon , Chargharey-Sombek
10	Dendrocalamus sp.	Dremling	useful bamboo	Tading
11	Himalayancalamus hookerianus	Pah-ryang	Bamboo, young shoot used as vegetable	Biru-Jamirkot, Lahareni, Tendu, Tendu, Dumtoe-Gairigaon, Chegmari-Dipu-jhora-Nangladang-Dhaper-Tenteray, Ghumauney-Lamitar-Ghalleygaon , Chargharey-Namselling-Sombek
12	Melocanna baccifera	Philim bans	Bamboo	Pugli-Gheesinggaon, Tading, Chargharey-Namselling
13	Pseudostachyum polymorphum	Philim, Phen	Bamboo used to make basket, young shoots are used as vegetable.	Biru-Jamirkot, Sipsu-Kotigaon, Lahareni, Dumtoe-Gairigaon, Dorokha-Maneygaon(rare), Samtse- Buduney, Chegmari-Dipu-jhora-Dhaper-Tenteray, Ghumauney-Lamitar-Ghalleygaon , Chargharey-Namselling-Sombek-Chungthung
14	Pseudostachyum sp.	Shemphay	Bamboo	Nainital-Bahuengaon
15	Dendrocalamus sp.	Dremling	Useful bamboo	Tading
16	Himalayancalamus hookerianus	Pah-ryang	Bamboo, young shoot used as vegetable	Biru-Jamirkot, Lahareni, Tendu, Tendu, Dumtoe-Gairigaon, Chegmari-Dipu-jhora-Nangladang-Dhaper-Tenteray, Ghumauney-Lamitar-Ghalleygaon , Chargharey-Namselling-Sombek

Table 4.6 (a) Types of Bamboo available in Samtse Dzongkhag

b. Types of Cane available in Samtse Dzongkhag

S. No.	Scientific Name	Local Name	Usage	Distribution within Samtse
1	Calamus acanthospathus	Gauribet, tshimtsha	Cane fruit chewed as betel nut. Young shoots are used as vegetable.	Bara-Assamtsha-Mukhiney, Tading, Denchhukha, Dumtoe-Gairigaon, Dorokha-Maneygaon, Pugli- Gheeshinggaon, Samtse-Budney, Chegmar-Dipu-jhora-Tenteray-Nangladang- Dhaper, Ghumauney, Lamitar-Ghalleygaon, Chargharey, Somebek-chungthung
2	Calamus erectus	Phegkray, pekri, phekri, phekori	Fruits are chewed as betel nut. Leaves can be used for roofing. Midribs are used to make hard broom	Bara-Assamtsha-Mukhiney, Biru-Jamirkota, Sipsu- Kothigaon, Tading, Denchhukha, Mayna-Boribotay, Dumtoe-Gairigaon, Dorokha-Maneygaon, Pugli-Gheeshinggaon, Samtse-Budney, Chegmar-Dipu-jhora-Tenteray-Nangladang-Dhaper, Ghumauney, Lamitar-Ghalleygaon, Chargharey, Namselling-Somebek-chungthung
3	Calamus inermis	Dhang-ray / dangri / dangray / mau / aulay bet, dey-tsha	Cane	Biru-Jamirkota, Lahareni, Tading, Denchhukha, Samtse-Budney, Chegmar-Dipu-jhora-Tenteray-Nangladang-Dhaper, Nainital-Majuwa, Chargharey –Somebek
4	Calamus latifolius	Putle bet	Cane	Biru-Jamirkota, Lahareni
5	Calamus leptospadix	Kukhrey / kukhurey / pani bet, zeechum-tsha	Cane useful to make furniture	Sipsu- Kothigaon, Tading, Denchhukha (rare), Dumtoe - Gairigaon, Samtse-Budney, Chegmar-Dipu-jhora-Tenteray-Nangladang-Dhaper, Nainital-Majuwa, Ghumauney- Lamitar-Ghalleygaon-Kataray, Chargharey, Namselling-Somebek-Chungthung
6	Plectocomia Himalayana	Phegkray, tokri, tara, damley,	Young shoot used as vegetable	Grown throughout Samtse but little bit in higher altitudal places.

Table 4.6 (b) Cane available in Samtse Dzongkhag

c. Types of Incenses available

S. No.	Scientific Name	Local Name	Usage	Distribution within Samtse
1	Artemisia Sp.	Titey-Pati, Khempa	The dried immature leaves flower' heads are used for expulsion of worms. Also useful in Fevers and Dropsy plus as a Stimulant. Buds are used to cure pneumonia. Entire plant either dry or fresh used as incense.	Found through out Samtse
2	Canarium Strictum	Gokul dhup	Gum used for Incense. People believe that burning incense of this gum would drive out the evil spirit.	Biru-Jamirkot, Sipsu-Kothigaon, Lahareni, Denchhukha, Mayna-Boribotay, Dumtoe-Gairigaon (rare), Dorokha-Maneygaon (rare), Chengmar-Dhaper. Nainital-Bahuengaon, Chargharey

S. No.	Scientific Name	Local Name	Usage	Distribution within Samtse
3	Cinnamomum glaucescens	Malagiri(rare)	Used seldom its heart wood chips as incense. Actually it is very useful tree. The Pericarp of the fruit yields essential oils used in perfumery, incense sticks, soap and toiletries, etc. Smoke from its sawdust can rid bed-buck and even snake. Foliage can be used as fodder.	Bara-Assamtsha-Mukhiney , Biru-Jamirkot,Sipsu-Kothigaon,Lahareni, Denchhukha,Mayna-Boribotay, Dumtoe-Gaiarigaon, Dorokha-Maneygaon, Pugli-Gheeshinggaon, Chengmari-Chargharey-Gathiya-Chungthung.

Table 4.6 (c) Types of Incenses available

Analysis of Non-wood Forest Produce

The supply of bamboo of various varieties is suitable for commercial exploitation. Bamboo treatment and preservation centre may be a viable investment. Cane furniture production should be considered. Incense stick and essence projects on cottage scale may also be viable. Scope exists for oleo resin and essential oil production.

4.7. Tourism¹ – Samtse

Existing	Potential
1. Attractions	
The Dzongkhag has some small Lhakhangs and a few other religious sights, mostly for the local people. Samtse is known for its cement, dolomite industries, beverages, fruit processing and liquor industries.	Haa – Sibsoo Trek could be developed (15 days via Tarilla and Tsonapata lakes; alpine, broad leaved and subtropical forest along the route).
2. Lodging Facilities	
One hotel and some government guesthouses.	The single hotel in Samtse town is unfit for tourists or business visitors. There is need for better hotels and guesthouses.
3. Food Service Facilities	
Only Bhutanese and Indian cuisine available.	
4. Transportation and Access	
Majority of the Gewogs are accessible by road. However, Samtse can only be reached by road via India as there is no direct road connection from within Bhutan.	A direct road connection from Chhukha.
5. Other Public Services/ Facilities	
	Internet cafes and wireless communication.

Table 4.7 Tourism- Samtse

The Dzongkhag has security issues due to the long unpoliced land border with India. Samtse, compared to other Dzongkhags has rather low potential in terms of cultural sights but has good potential for development of tourist resorts for the middle class. It is hot and rainy from April to September, but becomes pleasant thereafter. The Dorokha area with the Lhops population could be explored for winter trek. The Dzongkhag has limited potential for tourism, as it is too close and quite similar to Sikkim and Kalimpong area, which are much cheaper. However, the prospect of more industries could bring more business tourism.

Source:

¹Tourism Resources Inventory of Bhutan, Volume I & II August 15, 2005 & Bhutan Land of the Thunder Dragon -2005, Department of Tourism.

4.8 Minerals¹

4.8.1 Resource data

a. Limestone in Pagli-Titi area

S. No.	Topic	Details
1	Description	In the area, bedded limestone intercalated with phyllites occur: (1) At Pagli in the west (2) At Titi eastward and (3) At Bhavani Khola further east
2	Reserves	(1) 10.05 mio tons of cement grade proven. (2) 3.02 mio tons of cement grade proven. (3) 0.71 mio tons of cement grade proven.
3	Exploitation	(1) Leased to Penden Cement and mining the last reserves. (2) Leased to Lhaki Cement.
4	Existing/Potential Enterprises	Some of these limestone deposits are almost exhausted because the 1000 TPD Penden Cement plant has been in operation since last 26 years. It is looking for additional reserves in the region.

Table 4.8.1 (a) Limestone in Pagli-Titi area

b. Calc-tufa at Kalapani

S. No.	Topic	Details
1	Description	Calc-tufa confined to low lying areas adjacent to Manas Formation at Kalapani.
2	Reserves	1.073 mio tons proven of cement grade (probable).
3	Exploitation	Leased to Penden Cement Authority Ltd., Gomtu.
4	Existing/Potential Enterprises	This deposit is used by the Penden Cement as a sweetener in the raw mix.

Table 4.8.1 (b) Calc-tufa at Kalapani

c. Limestone at Tintale

S. No.	Topic	Details
1	Description	Bedded limestone interbanded with phyllite and quartzite at Tintale about 42 km west of Samtse town on Samtse-Sibsoo highway.
2	Reserves	0.38 mio tons of high cement grade inferred.
3	Exploitation	None
4	Existing/Potential Enterprises	Penden Cement may be able to use the deposit at a later stage being in the same Dzongkhag.

Table 4.8.1 (c) Limestone at Tintale

d. Limestone at Uttare

S. No.	Topic	Details
1	Description	Three bands of limestone have been found at Uttare village 5 km NW of Penden Cement Authority Ltd. plant at Gomtu. The northern band has a strike length of 1.4 km and thickness of 30 m. the central band strike length of 800 m and thickness of 10 m, and the southern band length of 500 m and thickness of 10 m.
2	Reserves	5.1 mio tons of cement grade proven.
3	Exploitation	About 0.50 mio tons mined to date.
4	Existing/Potential Enterprises	The deposit is leased to Penden Cement and being mined for cement manufacture since 2000.

Table 4.8.1(d) Limestone at Uttare

Source:

- ¹(1)The Bhutan Himalaya: A Geological Account- Special Publication 39, Edited by O.N. Bhargava, Geological Survey of India, 1995.
- (2) Atlas of Mineral Resources of the ESCAP Region, Vol.- 8, Bhutan – United Nations ESCAP and Department of Geology & Mines of Bhutan, 1991.
- (3) Department of Geology & Mines, Ministry of Economic Affairs, Thimphu.

e. Dolomite

S. No.	Topic	Details
1	Description	Bands of dolomite intercalated with slaty phyllite and quartzite occur at: (1) Samtse-Rehti-Sarkitar (Strike length 9 km and average thickness 200 m) from left bank of Khanabharti Khola in the west to right bank of Pagli Khola in the east. Suitable as fluxing agent and for refractory purposes. (2) Ure-Deergaon (Strike length 8 km; Thickness 50 m) from Ure village on left bank of Khanabharti Khola in the west to right bank of Pagli Khola in the east. (3) Khanabharti North-Pagli-Titi-Hauree (Strike length 16 km thickness 250 m) stretches from Dalamthan (near Bukay Dham) in the west to Hauree Khola in the east.
2	Reserves	(1) About 102 mio tons (2) About 29 mio tons (3) About 426.55 mio tons
3	Exploitation	(1) Parts of the deposit leased to M/S Jigme Mining Corporation Ltd.
4	Existing/Potential Enterprises	The first deposit is being mined by M/S Jigme Mining Corporation Ltd. that won the lease for 15 years in an open auction. Parts of the two other deposits may fall on the new Samtse- Phuentsholing highway under construction, which may be studied by the entrepreneurs for captive use.

Table 4. 8. 1 (e) Dolomite

f. Asbestos at Thumkey

S. No.	Topic	Details
1	Description	(1) Located about 5 km east of Chengmary, this is the only asbestos occurrence known in Bhutan. It occurs as veins varying in width from 3 cm to 5 cm and lengths reaching 3 m. It is brittle and splintery and hence the fibres cannot be spun. Detailed mapping of 0.06 km (2) Found the indicated reserves very small and insignificant.
2	Existing/Potential Enterprises	No economic significance.

Table 4.8.1(f) Asbestos at Thumkey

g. Quartzite at Tintale

S. No.	Topic	Details
1	Description	Two deposits known as Tintale (East) & Tintale (West) are located on the left bank and right bank of Jiti River respectively. Coarse-grained, snow-white to greenish/greyish white, hard, compact and well-jointed quartzite occurs within the Shumar formation. Thickness ranges from 4 to 42 m.
2	Reserves	Tintale (East)- 0.89 mio tons with silica content of 97.52% Tintale (West)- 3.49 mio tons with silica content of 97.54%
3	Exploitation	Tintale (East)- Being mined by Bhutan Ferro-Alloys Ltd., Pasakha Tintale (West)-Available for mineral concession
4	Existing/Potential Enterprises	Tintale (East) was one of the first high-grade quartzite found for ferrosilicon manufacture and Tintale (west) deposit is also of high grade.

Table 4.8.1 (g) Quartzite at Tintale

4.8.2 Recommended Further Investigation**1. High-grade quartzite and limestone**

High-grade quartzite and limestone deposits have been located at Tintale, about 42 km west of Samtse town on Samtse-Sipsoo highway. Similar deposits need to be explored in similar geological environment in the area. High-grade quartzite would be source of raw materials for the proposed ferrosilicon plants and glass industries, and high-grade limestone for calcium carbide and cement plants, manufacture of precipitated calcium carbonate and dehydrated lime in the Dzongkhag.

2. Dolomite based industries

Since the Dzongkhag has industrial land and is closest to the Indian markets, possible chemical industries based on dolomite can be looked into.

4.9 Human Resources¹ and Skills

Samtse has one National Institute for B.Ed., Post Graduate certificate courses and Distance Education programmes.

National Institute of Education (NIE), Samtse

S. No.	Degree/Diploma	Intake
1	Post Graduate Certificate in Education (PGCE)	50
2	B. Ed. (Secondary)	60
3	B. Ed. (Primary)	60
4	Distance Education	60
Total		230

Table 4.9 National Institute of Education (NIE), Samtse

4.10 SWOT Analysis

<p>Strengths</p> <ol style="list-style-type: none"> 1. Close proximity to Indian market 2. Value added agriculture & horticulture products (Cash Crops) 3. Rich mineral deposits with major mineral-based industries 4. Availability of water supply and power 5. Availability of industrial land 6. Livestock extension centre 	<p>Weaknesses</p> <ol style="list-style-type: none"> 1. Access to rest of the Dzongkhag through India only 2. Relatively poor and underdeveloped Gewogs 3. Settlement in difficult terrain 4. Institutional support for micro enterprise development non existent
<p>Opportunities</p> <ol style="list-style-type: none"> 1. Greenhouse & poly shed house for off -season vegetables for Indian market 2. Bamboo & cane furniture & artifacts 3. Availability of limestone & dolomite minerals. 4. Potential for fragrance & aromatic products (Non wood resources abundance) 5. Industrial estate of 565 acres identified and feasibility report completed 6. Maize and paddy are the main crops, that offer scope for development of processing industries 7. Ginger and cardamom offer scope of spice oleoresin processing units 	<p>Threats</p> <ol style="list-style-type: none"> 1. Cheap goods from India 2. Accessibility with rest of Bhutan through India only 3. Ecological balance between available resources and development

Table 4.10 SWOT Analysis

4.11 Need for Government Support

- a. The horticulture and livestock produce is in surplus beyond the local consumption. As such, Government can support setting up of a collection centre for inter-Dzongkhag trade.
- b. Setting up of Cluster Development Initiative (CDI) through suitable national/developmental funding for spices like cardamom and ginger, which will include support for higher yields, more spice varieties, and collection, storage and packing, as well as improve grower's collective competitiveness in supply of spices in oleoresin or spice in powder form could be explored..
- c. The climatic conditions are favorable for setting up of high technology green house for exotic vegetables and floriculture. The initial investment can be made by the Government through suitable developmental funding and it can later run on a self sustaining model. The local farmers/entrepreneurs should be encouraged to cultivate exotic vegetables, flowers and other value added crops after getting the saplings from the green house.

Source:

¹Department of Human Resources, Ministry of Labour & Human Resources, Thimphu.

4.12 Investment Opportunity Ideas

Analysis of the resources and facilities as enumerated above indicates good scope for establishment of business activities in the Dzongkhag. The favorable conditions for industrial activities are the availability of mineral resources, potential for cultivation of agro-horticultural produces, easy access to Indian market, and availability basic infrastructure among others. Accordingly, the following project ideas emerge which are listed under the heads Trade, Manufacture and Services that the interested investors could undertake after detailed project studies.

a. Trade

- Retail shops

b. Manufacturing

- Fruit/Vegetable cleaning, grading, processing, packaging and retailing
- Off-season chilli growing for Thimphu market
- All season banana, papaya growing for the Thimphu market
- Break fast cereal production units (Corn based)
- Standardized Ara(Local Drink) making
- Mushroom cultivation
- Medicinal and organic vegetable cultivation
- Bio-diesel seeds cultivation
- Floriculture
- Dairy farming & milk collection centre
- Poultry/Piggery farm
- Fishery
- Cattle feed unit
- Incense and aromatic products unit
- Traditional medicinal processing plant
- Briquette plant from agro waste
- Bamboo and cane furniture
- Mining of dolomite/quartzite/limestone/talc
- Mineral-based industries
- Mgco₃ and caco₃ extraction from Dolomite
- Mineral water

c. Services

- Quality hotel/restaurant
- Bio-technology research institute
- Development of medicinal plant serum research