

LIVESTOCK SECTOR BRIEF

INDIA

Food and Agriculture Organization
of the United Nations • **FAO**

Livestock Information, Sector Analysis
and Policy Branch • **AGAL**



July 2005

TABLE OF CONTENTS

Preface	ii
1. General Information.....	1
Human population, land and socio-economics	1
Human population trends	2
Trends in agricultural land	2
2. Livestock Resources.....	3
Livestock populations	3
Contribution of different species to total livestock units	3
Selected indicators of livestock resources	4
Agro-ecological zones and densities of livestock species (2000)	5
3. Livestock Production	7
Trends in annual production of meat, milk and eggs	7
Composition of total meat production	7
Carcass weights and percentage slaughtered by species.....	8
Milk yields and proportion of dairy animals.....	8
Egg yields and proportion of laying birds.....	8
Estimated feed used for livestock production.....	9
Trends in annual per capita production of meat, milk and eggs.....	9
4. Consumption of Meat, Milk and Eggs	10
Trends in annual consumption of meat, milk and eggs	10
Trends in annual per capita consumption of meat, milk and eggs.....	11
Production versus consumption for meat, milk and eggs (2002)	11
5. Trade in Livestock and Livestock Products.....	12
Trade in agricultural and livestock products.....	12
Export/import 'dependency' for livestock products	12
Trade in live animals	14
Trade in livestock products	15
6. Livestock Health	16
Total number of cases/outbreaks of selected diseases reported in all susceptible species	16
7. References and Further Reading.....	18

Data contained in this Livestock Sector Brief are taken from official sources. Official sources are no guarantee for data accuracy and the figures reported in this brief should be taken as indicative and not be used for official purposes. The Food and Agriculture Organization of the United Nations assumes no responsibility for its accuracy, completeness and coherence.

PREFACE

The Livestock Sector Briefs (LSB) are intended to provide a quick overview and an approximate outlook for the livestock sector of the respective country using figures and quantitative indicators originating from official sources. The LSBs are complemented by a synthesis of policy documents available in the public domain.

The majority of the data in the LSBs refer to the country as a whole and come from FAOSTAT, which is available on the internet (<http://faostat.external.fao.org/default.jsp>). FAO, as part of its mandate, compiles information and data on various aspects of food and agriculture from all countries. The data are analysed and interpreted to support FAO's programmes and activities and, in accordance with the basic functions of the Organization, they are disseminated to the public through publications, CD-ROM, diskettes and the Internet. The country level data are officially submitted to the Division for Statistics of FAO (ESS) by various ministries of the respective countries. For details of data collection procedures see <http://faostat.fao.org/abcdq/about.htm>. The figures submitted often display inconsistencies across ministries, for example reported meat production does not always match reported meat consumption when taking into account imports and exports. FAO tries to reconcile the figures, to the effect that FAO statistics may differ from those originally submitted.

The LSBs utilise FAOSTAT data from the following domains: human population, land use, agriculture production, food supply and agricultural and food trade. These are used to derive a standard set of indicators that can quickly be compared across the countries.

Data on the economy are from the World Bank's World Development Indicators CD-Rom, which is also available online <http://www.worldbank.org/data/> and is updated every year. Animal health data are taken from the Office International des Epizooties (OIE) HANDISTATUS II <http://www.oie.int/hs2/>. These are official data supplied by member nations.

For any feedback and comment, please contact:

Pius Chilonda - Livestock Information Analyst
Livestock Information, Sector Analysis and Policy Branch
Animal Production and Health Division
Food and Agricultural Organisation
Viale delle Terme di Caracalla
00100 Rome, Italy

Tel: 00 39 06 57056691
Fax: 00 39 06 57055749
Email: Pius.Chilonda@fao.org

1. GENERAL INFORMATION

Human population, land and socio-economics

Human population	1,049.5 million
Population density on total land	353.0 persons/sqkm
Annual growth rate (1990-2000)	1.8 %
Population in agriculture	553.3 million
As proportion of total population	52.7 %
Total land area	2,973,190 sqkm
Agricultural land	1,811,770 sqkm
As proportion of total land	60.9 %
Land under pasture	110,620 sqkm
As proportion of total land	6.1 %
Irrigated area	571,980 ha
Agricultural land per 100 people	17.3 ha
Agricultural land per 100 people in agriculture	32.7 ha
Agricultural population density on agricultural land	305.4 persons/sqkm
GDP ¹	517,263 million US\$
GDP annual growth rate (1990-2000)	5.9 %
GDP per capita/year ¹	493 US\$
GDP per capita annual growth rate (1990-2000)	4.1 %
Agriculture, GDP	104,102 million US\$
As proportion of total GDP	20.1 %
Livestock, GDP ¹	34,947 million US\$
As proportion of agricultural GDP	33.6 %
Human development Rank	127 Ranking ²
Human development index	0.595
Poverty incidence ³	
Total	28.6 %
Urban	24.7 %
Rural	30.2 %

¹Constant 1995 US\$ ² The HDI rank is determined using HDI values to the fifth decimal point – from 177 countries, as compiled by the UNDP; ³ National poverty line; na: not available

Source: World Bank (2002); UNDP (2004); FAO (2005a)

- India is a low-income economy with a GDP per capita of 493 US\$. Agriculture, industry and services account for 20, 28 and 52 percent of GDP respectively. The population is 1.05 billion: 72% live in rural areas and 42% are employed in agriculture. In recent years GDP growth averaged 5.9% per annum, with agriculture being the slowest growing sector in the economy.

Human population trends

Values expressed in 1,000

Population segment	Year				Annual growth rate (%)	
	1980	1990	2000	2002	1980-1990	1990-2000
Total	688,856	846,418	1,016,938	1,049,549	2.1	1.9
Rural	530,006	630,285	735,684	754,703	1.7	1.6
Urban	158,850	216,133	281,255	294,846	3.1	2.7

Source: FAO (2005a)

Trends in agricultural¹ land

Values expressed in sqkm

Land type	Year				Annual growth rate (%)	
	1980	1990	2000	2002	1980-1990	1990-2000
Total	1,803,550	1,810,400	1,807,950	1,811,770	0.0	0.0
Cropped ²	1,682,550	1,694,380	1,697,550	1,701,150	0.1	0.0
Pastures	121,000	116,020	110,400	110,620	-0.4	-0.5

¹The sum of area under arable land, permanent crops and permanent pastures

²Arable and permanent crops

Source: FAO (2005a)

- The agriculture sector in India contributes over 20% to GDP. The sector is dominated by small farms, and the main products are rice, wheat, coarse cereals, oilseeds, pulses, cotton and jute. Productivity is generally low and distribution of production is unevenly distributed among States.
- A major concern in rural India is the large numbers of landless or near-landless families. Under the 1949 Indian Constitution, States were granted the power to enact and implement land reforms, with subsequent significant heterogeneity across States and time in terms of number and types of land laws. Some States simply regulated tenancy contracts, some abolished the Zamindari system, others imposed size ceilings on land holdings and/or attempted to reduce landholdings fragmentation. Since independence inequality in the distribution of land has certainly lessened, and today the average size of operational holding is 1.41 ha. However, significant differences exist among States and both lack of access to land and high fragmentation of landholdings are still considered among the main determinants of poverty.

2. LIVESTOCK RESOURCES

Livestock populations

Values expressed in 1,000

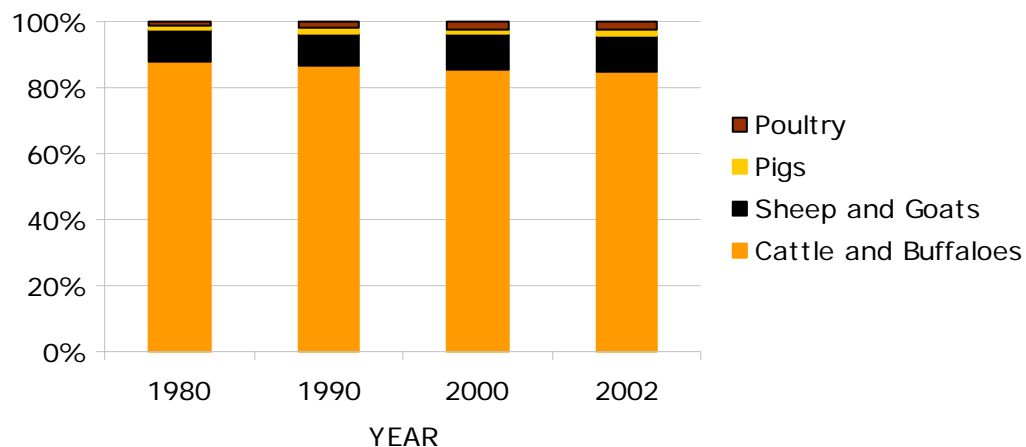
Species	Year				Annual growth rate (%)	
	1980	1990	2000	2002	1980-1990	1990-2000
Cattle and buffaloes	252,570	283,070	286,400	284,800	1.1	0.1
Sheep and goats	131,870	161,900	181,000	181,600	2.1	1.1
Pigs	9,000	12,000	13,700	14,000	2.9	1.3
Poultry	201,400	316,600	393,500	425,800	4.6	2.2
Total LUs	143,286	163,291	167,975	167,618	1.3	0.3

LU: Livestock unit; **conversion factors:** cattle (0.50), buffalo (0.50), sheep and goats (0.10), pigs (0.20) and poultry (0.01)

Source: FAO (2005a)

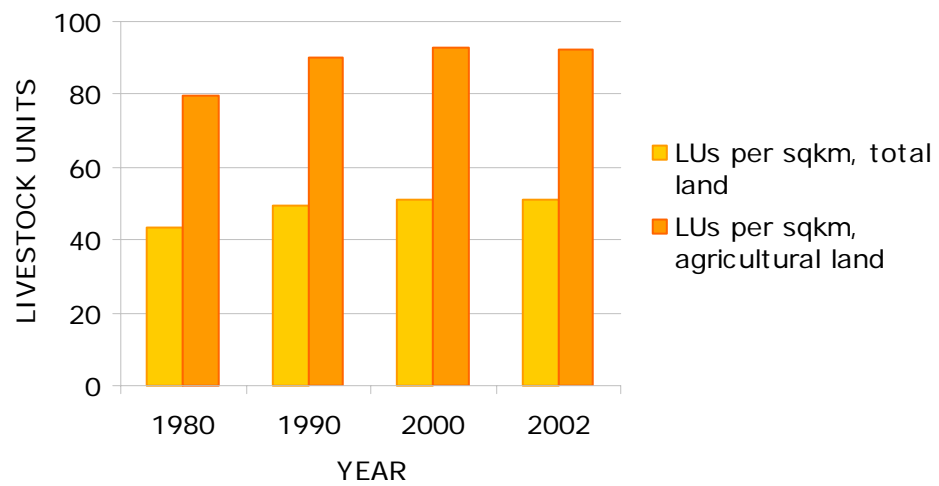
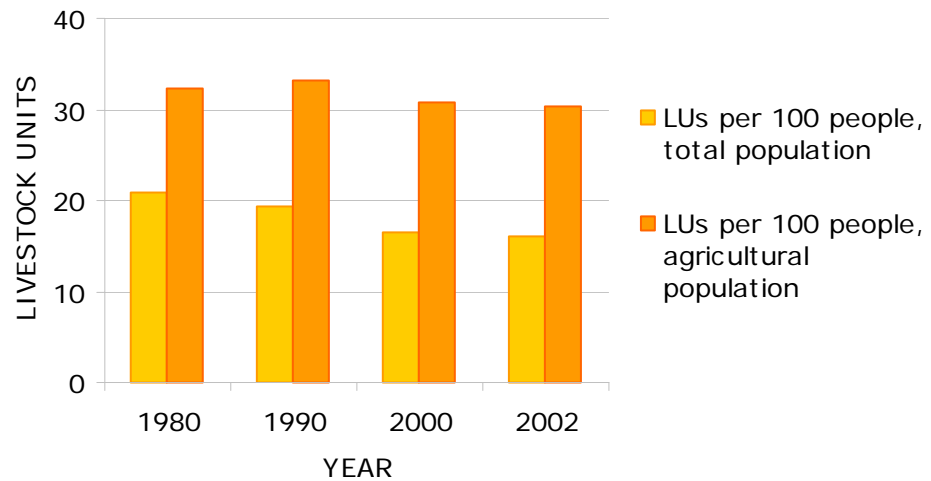
- The livestock sector contributes around 6.8% to GDP and employs 8% of the labour force. The contribution of the livestock sub-sector to agricultural GDP has increased impressively in the last twenty years, from less than 15% in the late 70s to over 33% in 2002.

Contribution of different species to total livestock units



Source: FAO (2005a)

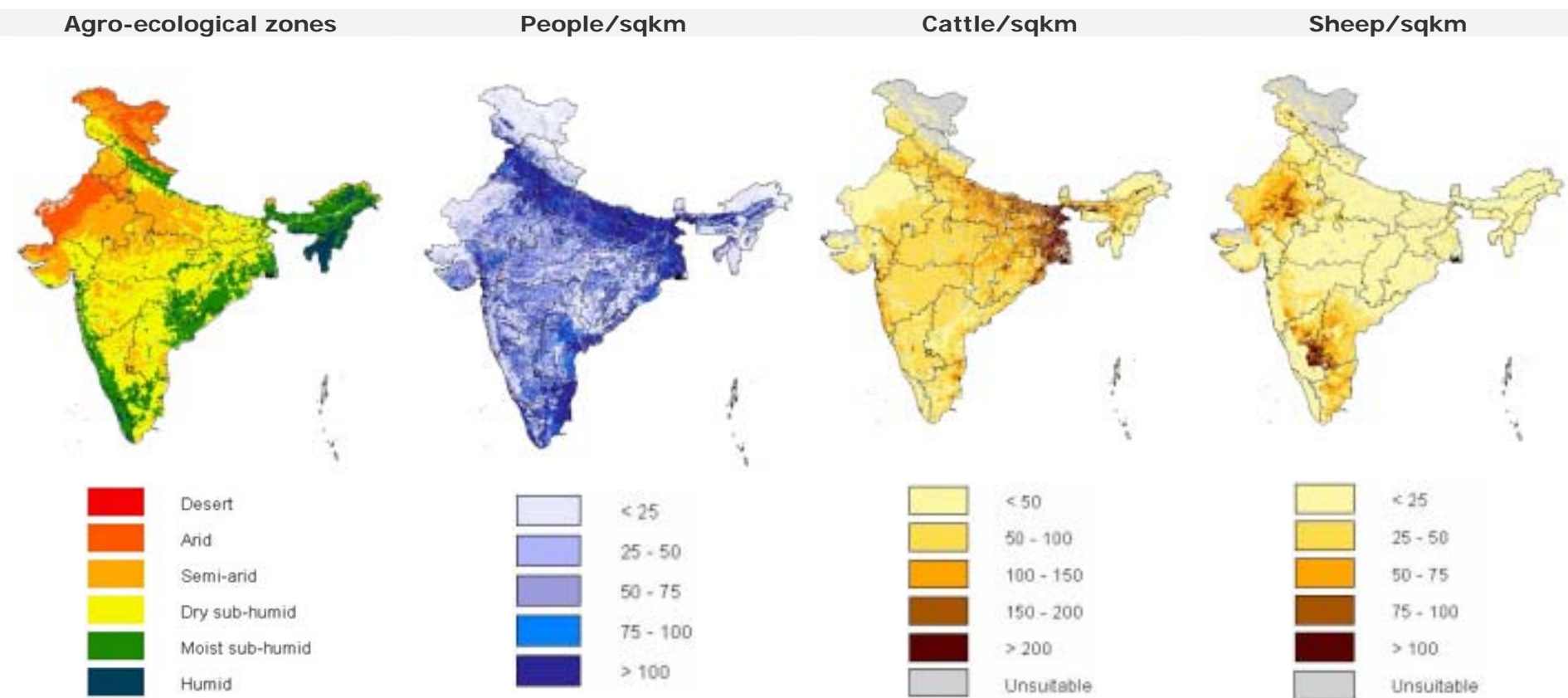
Selected indicators of livestock resources



Source: FAO (2005a)

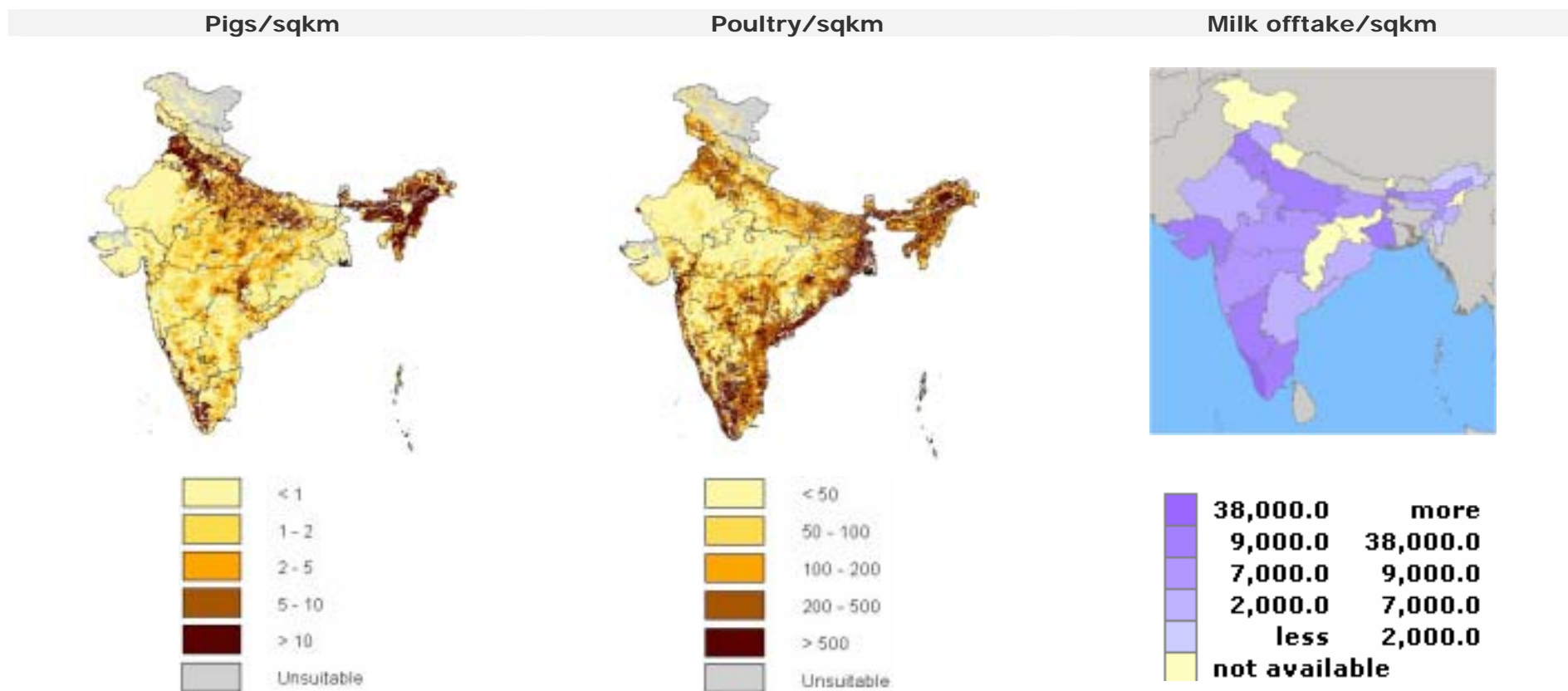
Agro-ecological zones and densities of livestock species (2000)

Density calculated on total land area¹



¹Densities for livestock populations and production is based on total land suitable for livestock production

Source: FAO (2001); LandScan (2002); FAO (2005b)



Source: FAO (2005b)

- The total area of permanent pastures and grasslands is about 6% of the country's geographical area. Forests are another major source of grazing and fodder collection. The grassland based production system is prevalent in the Himalayas where there are several nomadic tribes. The animals are moved to sub-alpine and alpine pastures during summer, while during winter they are grazed on adjoining plains. Small scale mixed crop livestock farming is the common and most dominant form of animal husbandry in India. Peri-urban and urban livestock production systems contribute significantly to milk production, and they are typically located in and around Delhi, Mumbai, Calcutta, Bangalore and other large cities, where the milk is sold.

3. LIVESTOCK PRODUCTION

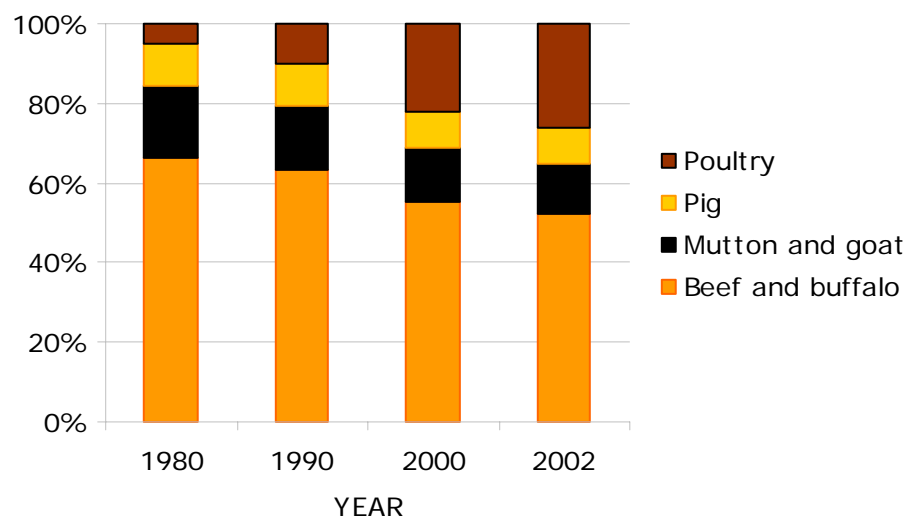
Trends in annual production of meat, milk and eggs

1,000 metric tonnes

Product	Year				Annual growth rate (%)	
	1980	1990	2000	2002	1980-1990	1990-2000
Meat, total	2,627	3,930	5,304	5,701	4.1	3.0
Beef and buffalo	1,674	2,403	2,858	2,912	3.7	1.7
Mutton and goat	456	611	696	703	3.0	1.3
Pig	262	417	476	487	4.8	1.3
Poultry	132	372	1,136	1,460	10.9	11.8
Milk, total	31,560	53,678	80,830	87,300	5.5	4.2
Eggs, total	583	1,161	1,749	2,000	7.1	4.2

Source: FAO (2005a)

Composition of total meat production



Source: FAO (2005a)

Carcass weights and percentage slaughtered by species

Species/year	Carcass weight (kg/animal)				Percentage slaughtered/year			
	1980	1990	2000	2002	1980	1990	2000	2002
Cattle	88.0	100.6	103.0	103.0	5.2	6.5	7.2	7.5
Buffaloes	138.0	138.0	138.0	138.0	9.0	9.7	11.0	11.0
Sheep	12.0	12.0	12.0	12.0	28.5	31.0	32.0	31.8
Goat	10.0	10.0	10.0	10.0	34.8	38.0	38.5	39.0
Pigs	35.0	35.0	35.0	35.0	83.0	99.2	99.3	99.3
Poultry	0.9	0.9	1.0	1.0	69.7	127.2	303.2	360.7

Source: FAO (2005a)

Milk yields and proportion of dairy animals

Species/year	Milk yield (kg/year)				Percentage milked			
	1980	1990	2000	2002	1980	1990	2000	2002
Cattle	524	732	944	976	13.6	15.0	18.6	19.9
Buffaloes	964	1,122	1,423	1,455	27.2	32.1	33.5	34.6

Source: FAO (2005a)

Egg yields and proportion of laying birds

Species/year	Eggs (kg/year)				Percentage laying			
	1980	1990	2000	2002	1980	1990	2000	2002
Chicken	7.8	10.1	11.7	11.9	40.1	39.1	41.6	42.7

Source: FAO (2005a)

Estimated feed used for livestock production

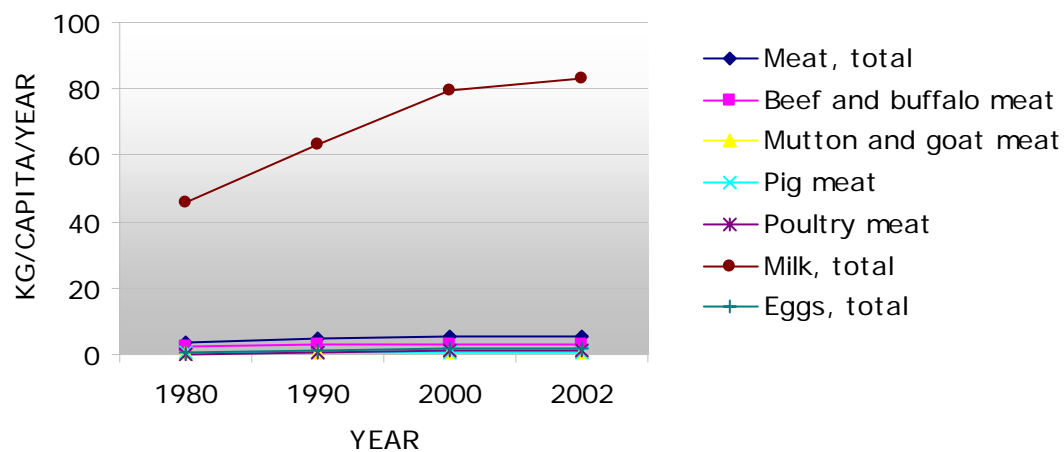
1,000 metric tonnes

Product	Year				Annual growth rate (%)	
	1980	1990	2000	2002	1980-1990	1990-2000
Maize	132	600	5,200	5,200	16.3	24.1
Barley	195	178	130	128	-0.9	-3.1
Sorghum	125	140	90	84	1.1	-4.3
Millet	134	172	161	104	2.5	-0.7
Wheat	382	598	916	873	4.6	4.4
Brans	9,498	11,309	12,406	9,552	1.8	0.9
Rice Paddy, equivalent	321	446	510	454	3.3	1.3
Roots and Tuber, dry equivalent						
Pulses	750	1,057	1,148	1,234	3.5	0.8
Oil crops	557	647	627	682	1.5	-0.3

Blanks represent no data

Source: FAO (2005a)

Trends in annual per capita production of meat, milk and eggs



Source: FAO (2005a)

- Meat production increased about 3 percent between 1990 and 2000, with poultry and milk production growing at 11.8 and 4.2 percent per year respectively, and all other meats at below 2 percent.
- Independent and relatively small-scale producers account for the bulk of poultry production. A significant feature of India's poultry industry, however, has been its transformation from a backyard activity into a major commercial activity in a few decades, so much that today poultry is one of the fastest growing segments of the agricultural sector.
- The Operation Flood (OF) program, one of the world's largest and most successful dairy development programs, was launched by the Government in 1970. Operation Flood has led to the modernization of India's dairy sector and has created a strong network for procurement, processing, and distribution of milk by the cooperative sector, which continues to play an important role in keeping smallholders involved with this fast-growing sector. Today roughly two-thirds of national milk production comes from the States of Uttar Pradesh, Punjab, Rajasthan, Madhya Pradesh, Maharashtra, Gujarat, Andhra Pradesh, and Haryana.

4. CONSUMPTION OF MEAT, MILK AND EGGS

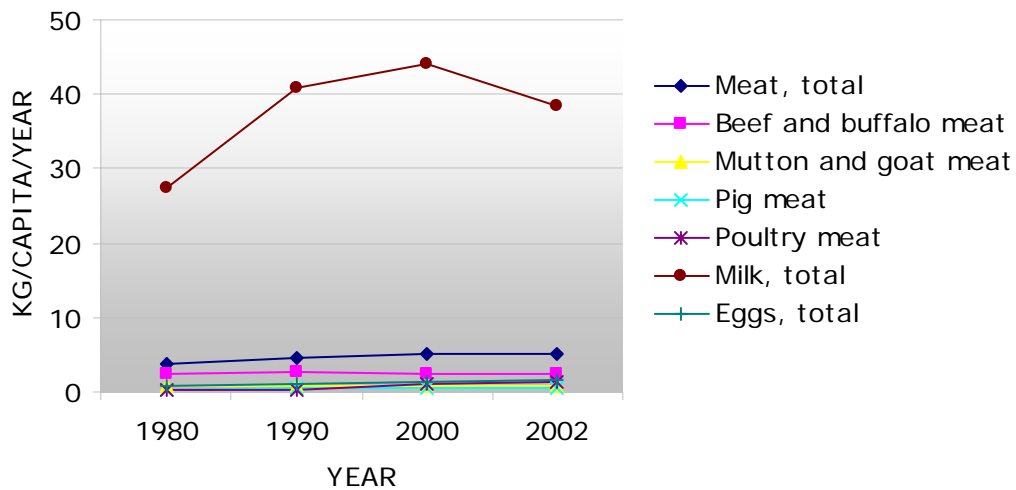
Trends in annual consumption of meat, milk and eggs

1,000 metric tonnes

Product	Year				Annual growth rate (%)	
	1980	1990	2000	2002	1980-1990	1990-2000
Meat, total	2,574	3,857	5,056	5,457	4.1	2.7
Beef and buffalo	1,626	2,340	2,575	2,607	3.7	1.0
Sheep and goat	455	603	684	698	2.9	1.3
Pig	261	417	578	613	4.8	3.3
Poultry	132	371	1,081	1,400	10.9	11.3
Milk, total	18,885	34,592	44,878	40,412	6.2	2.6
Eggs, total	509	1,010	1,465	1,650	7.1	3.8

Source: FAO (2005a)

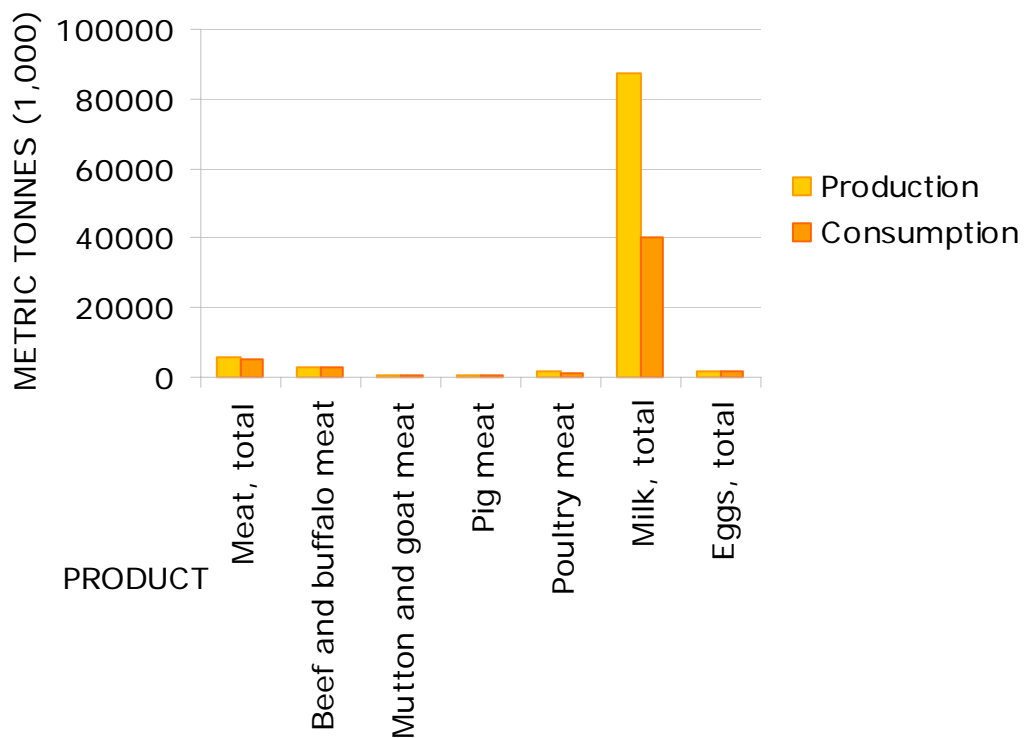
Trends in annual per capita consumption of meat, milk and eggs



Source: FAO (2005a)

- From 1990 to 2000 consumption of meat and milk increased by 2.7% and 2.6%. Increased poultry demand (+11.3%) explains to a great extent this positive trend. Levels of consumption are expected to grow higher in the years to come, as they are very well below developing and developed countries averages.

Production versus consumption for meat, milk and eggs (2002)



Source: FAO (2005a)

5. TRADE IN LIVESTOCK AND LIVESTOCK PRODUCTS

Trade in agricultural and livestock¹ products

Values in billion US\$

Product	Exports				Imports			
	1980	1990	2000	2002	1980	1990	2000	2002
Total	11.4	22.6	63.5	77.7	17.2	27.1	67.0	79.6
Agricultural	2.5	3.1	5.0	5.5	1.5	1.1	2.9	4.0
% agricultural	21.7	13.6	7.8	7.1	8.5	4.0	4.3	5.1
Livestock	0.1	0.1	0.4	0.3	0.1	0.0	0.1	0.1
% livestock	0.7	0.4	0.6	0.4	0.8	0.2	0.1	0.1

¹Total trade in goods and services expressed in current US\$. Source: World Bank (2002)
Agricultural trade refers to all agricultural products, while livestock trade refers to trade in livestock products and live animals. Source: FAO (2005b)

Export/import 'dependency' for livestock products

Product	Exports as percentage of production				Imports as percentage of consumption			
	1980	1990	2000	2002	1980	1990	2000	2002
Meat, total	1.98	1.83	5.66	5.37	0.00	0.00	0.00	0.00
Beef and buffalo	2.82	2.64	10.08	10.25	0.00	0.00	0.00	0.00
Sheep and goat	0.25	1.36	1.71	0.71	0.00	0.00	0.00	0.00
Pig	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.01
Poultry	0.01	0.06	0.02	0.07	0.00	0.00	0.00	0.00
Milk, equivalent	0.01	0.01	0.17	0.19	1.84	0.02	0.14	0.19
Eggs, total	0.38	0.13	0.65	0.76	0.00	0.00	0.00	0.03

Source: FAO (2005a)

Product	Net exports as percentage of production				Net imports as percentage of consumption			
	1980	1990	2000	2002	1980	1990	2000	2002
Meat, total	1.98	1.83	5.66	11.66	0.00	0.00	0.00	0.00
Beef and buffalo	2.82	2.64	10.08	17.84	0.00	0.00	0.00	0.00
Sheep and goat	0.25	1.36	1.71	1.09	0.00	0.00	0.00	0.00
Pig	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.00
Poultry	0.01	0.06	0.02	0.78	0.00	0.00	0.00	0.00
Milk, equivalent	0.00	0.00	0.09	0.27	1.83	0.00	0.00	0.00
Eggs, total	0.38	0.13	0.65	2.50	0.00	0.00	0.00	0.00

Source: FAO (2005a)

- In 2002-2003 India ran a trade deficit of US\$ 5.8 billion, even though the agricultural trade balance presented a surplus. The livestock sub-sector recorded a positive trade balance. The latest available statistics (2002/03) indicate that India exports live animals valued at US\$ 1.4 million, meat and edible meat offal estimated at US\$ 320.4 million, dairy products, poultry and honey worth US\$ 33.9

million, leather products for US\$ 191.9 million. However, India imports animal fodder and feed valued at US\$ 180.1 million, and raw wool and animal hair for about 102.3 US\$ million.

- India is a member of WTO since 1 January 1995. Over the years, it has also committed itself to a series of free and preferential trade agreements, including those with Thailand, the Association of South-East Asian Nations, Mercosur and Singapore. India was among the founders of the South Asian Association for Regional Cooperation (SAARC), whose major achievement in 1995 was the establishment of preferential trading arrangements between Bangladesh, Bhutan, India, Maldives, Pakistan and Sri Lanka, and it is also a member of the BIMST-EC (Bangladesh, India, Myanmar, Sri Lanka, Thailand - Economic Cooperation) formed in 1997.

Trade in live animals

Species	1980			1990			2000			2002		
	Export	Import	Net trade	Export	Import	Net trade	Export	Import	Net trade	Export	Import	Net trade
Quantities (count)												
Cattle and buffaloes	24,564	16	24,548	19,000	2,054	16,946	0	2,015	-2,015	0	4,674	-4,674
Sheep and goats	110,670	7,107	103,563	8,000	146,599	-138,599	0	21,476	-21,476	1,306	28,150	-26,844
Pigs	0	0	0	19,000	17,100	1,900	0	9,754	-9,754	0	9,432	-9,432
Poultry (1,000)	418	2	416	437	0	437	5,946	0	5,946	4,709	11	4,698
Value (1,000 US\$)												
Cattle and buffaloes	6,573	6	6,567	6,000	72	5,928	1	36	-35	0	176	-176
Sheep and goats	3,659	52	3,607	150	1,838	-1,688	0	153	-153	23	217	-194
Pigs	0	0	0	380	450	-70	0	111	-111	0	125	-125
Poultry (1,000)	149	29	120	123	0	123	1,501	0	1,501	1,138	99	1,039
Total	10,381	87	10,294	6,653	2,360	4,293	1,502	300	1,202	1,161	617	544

Net trade: Exports less Imports

Blanks represent no data

Source: FAO (2005a)

Trade in livestock products

Product	1980			1990			2000			2002		
	Export	Import	Net trade	Export	Import	Net trade	Export	Import	Net trade	Export	Import	Net trade
Quantities (metric tonnes)												
Meat, total	51,893	6	51,888	72,070	0	72,070	300,252	27	300,224	306,244	78	306,166
Beef and buffalo	47,126	3	47,124	63,384	0	63,384	288,063	0	288,063	298,609	0	298,609
Mutton and goat	1,145	0	1,145	8,327	0	8,327	11,903	6	11,897	4,973	2	4,971
Pig	4	0	4	3	0	3	3	20	-17	1,143	59	1,084
Poultry	9	0	9	228	0	228	259	1	258	1,041	17	1,024
Other	3,609	3	-3,613	128	0	-128	23	0	-23	478	0	-478
Milk, equivalent	2,876	347,751	-344,875	4,709	5,718	-1,009	137,269	61,039	76,230	162,869	76,294	86,575
Eggs, total	2,218	0	2,218	1,524	0	1,524	11,344	23	11,321	15,128	562	14,566
Hides and skins	10	383	-373	173	12,890	-12,717	71	21,754	-21,683	752	18,118	-17,366
Value (1,000 US\$)												
Meat, total	61,041	55	60,986	78,154	0	78,154	324,364	209	324,156	279,644	378	279,266
Beef and buffalo	49,161	7	49,154	59,764	0	59,764	306,277	3	306,274	269,021	0	269,021
Mutton and goat	1,659	0	1,659	17,503	0	17,503	17,406	81	17,325	8,217	5	8,212
Pig	18	0	18	17	0	17	2	115	-113	928	318	610
Poultry	10	0	10	385	0	385	413	6	407	938	50	888
Other	10,193	48	-10,241	485	0	-485	266	4	-270	540	5	-545
Milk, equivalent	1,268	135,559	-134,291	1,446	2,222	-776	52,410	10,949	41,461	43,489	13,085	30,404
Eggs, total	2,657	0	2,657	1,154	0	1,154	12,741	40	12,701	13,807	1,091	12,716
Hides and skins	322	444	-122	317	36,930	-36,613	197	57,944	-57,747	1,714	57,704	-55,990
Total	65,288	136,058	-70,770	81,071	39,152	41,919	389,712	69,142	320,571	338,654	72,258	266,396

Net trade: Exports less Imports

Blanks represent no data

Source: FAO (2005a)

6. LIVESTOCK HEALTH

Total number of cases/outbreaks of selected diseases reported in all susceptible species

Disease	1997	1998	1999	2000	2001	2002	2003
African swine fever	000	000	000	000	000	000	000
Avian Influenza ¹	000	000	000	000	000	000	000
Bluetongue	1,023/31	14,9836/860	1,656/91	9,347/426	17,983/710	154/13	20,047/391
BSE ²	000	000	000	000	000	000	000
CBPP ³	(1990)	(1990)	(1990)	(1990)	(1990)	(1990)	(1990)
Classical swine fever	2,656/58	5,669/142	8,800/142	1,305/53	13,224/236	9,546/190	1,156/53
Foot and mouth disease	40,969/3,571	84,749/1,165	59,479/1,479	36,483/1,537	78,679/2,697	72,185/3,385	12,9131/1,903
Lumpy skin disease	000	000	000	000	000	000	000
Newcastle disease	120,867/759	25,950/310	34,961/450	26,838/464	53,556/633	160,183/812	363,901/338
Peste des petits ruminants	3,406/81	9,309/193	19,255/248	3,131/86	35,078/319	7,091/76	32,933/623
Rift Valley fever	000	000	000	000	000	000	000
Rinderpest	(06/1995)	(06/1995)	(06/1995)	(06/1995)	(06/1995)	(06/1995)	(06/1995)
Sheep and goat pox	5,587/208	5,869/73	1,508/86	4,608/186	7,334/433	3,436/122	6,771/265
Swine vesicular disease	000	000	000	000	000	000	000
Vesicular stomatitis	000	000	000	000	000	000	000

¹ Highly pathogenic avian influenza

² Bovine spongiform encephalopathy

³ Contagious bovine pleuropneumonia

no/ no number of cases/outbreaks, ... no information available, - disease not reported, 000 disease never reported; (month/year) date of the last reported occurrence of the disease in previous years

Source: OIE (2004)

- Livestock diseases severely constraint production and productivity, despite a major pillar of the Government of India's livestock development strategy over the last three decades has been the highly subsidised public delivery of veterinary services. Over time, the Governments have built up vast networks of physical and human infrastructure to provide these services to millions of farmers. But since the quality of services provided by these institutions is poor, the Department of Animal Husbandry has proposed a scheme "Livestock Health & Disease Control", which during the 10th Development Plan aims to improve diagnosis of a series of common diseases.

7. REFERENCES AND FURTHER READING

- Ahuja, V., McConnel, K. E., Umali-Deininger, D., de Haan, C. (2003)** Are the Poor Willing to Pay for Livestock Services? Evidence from Rural India, *Indian Journal of Agricultural Economics*, 58 (1): 84-99.
- Deshpande, R.S. (2003)** Current land policy issues in India, *Land Reform*, 3, pp. 155-174.
- FAO (2001)** Agro-ecological Distributions for Africa, Asia and North and Central America, Consultants' Report. Food and Agriculture Organisation, Rome.
- FAO (2005a)** FAOSTAT data. Food and Agriculture Organisation, Rome. <http://faostat.external.fao.org/default.jsp> (accessed July, 2005).
- FAO (2005b)** Global Livestock Production and Health Atlas. Food and Agriculture Organisation, Rome. <http://www.fao.org/ag/aga/glipha/index.jsp> (accessed July, 2005).
- FAO-ESC (2003)** WTO Agreement on Agriculture: The Implementation Experience - Developing Country Case Studies (Rome: FAO).
- Government of India, Department of Animal Husbandry (2003)** Annual Report 2002-2003, New Delhi.
- Government of India, National Development Council (2002)**, 10th Five Year Plan, New Delhi.
- LandScan (2002)** Global Population Database. Oak Ridge National Laboratory, Oakridge. <http://www.ornl.gov/gist/>
- OIE (2004)** HANDISTATUS II. Office International des Epizooties, Paris. <http://www.oie.int/hs2/> (accessed July, 2005).
- Panagariya, A. (2004)** India in the 1980s and 1990s: A Triumph of Reforms, IMF Working Paper 04/43, Washington D.C.
- Purfield, C. (2004)** The Decentralization Dilemma in India, IMF Working Paper 04/32, Washington D.C.
- Ramachandran, V.K., Swaminathan M. (2001)** Does Informal Credit Provide Security? Rural Banking Policy in India, mimeo, ILO: Geneva.
- Smith, L.E.D., Urey, I. (2002)** Agricultural growth and poverty reduction: a review of lessons from the post-independence and green revolution experience in India, mimeo, Department of Agricultural Sciences, Imperial College, Wye, UK.
- UNDP (2004)**. The Human development Reports, United Nations Development Programme, New York. <http://hdr.undp.org/statistics/>
- World Bank (2002)** The 2002 World Bank development indicators CD-Rom. The World Bank, Washington DC.
- WTO (2002)** Trade Policy Review: India. Report by the Government, Geneva: WTO.