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Livestock Production and the Rural Poor in Andhra Pradesh and Orissa States, India

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Pro-Poor
Livestock
Policy
Initiative

Livestock Production and the Rural Poor in Andhra Pradesh and Orissa States, India

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CONTENTS

Preface	ii
Abbreviations	iii
Executive Summary	iv
Introduction	1
Section I: Land, livestock, and poverty in India, Andhra Pradesh and Orissa	2
Section II: Sectoral overview	13
‘Cow’ politics	13
State involvement in cooperative dairy	15
State service provision: Animal health and breeding	17
Meat production	20
Section III: Recent Reforms	22
Liberalization & the dairy market	22
Grazing on common & state property: <i>New restrictions</i>	24
New management strategies: Decentralization & user groups	25
National livestock sector policy process	27
Orissa livestock sector policy	28
Andhra Pradesh’s Vision 2020	32
Conclusion: Strategic Entry Points, Actors, and Alternatives	35
Enhancing producers’ ability to act on their own behalf	35
Improving access to shared resources	36
Encouraging & enabling pro-poor animal health sector reforms	37
Dairy sector: Reducing intervention and increasing competition	39
Small ruminant sector: Improving feed and fodder, researching markets & breeding	39
References	41

TABLES

Table 1: Poverty in Orissa and Andhra Pradesh	2
Table 2: Rural land ownership	3
Table 3: Land and livestock ownership in Indian rural areas	6
Table 4: Equity in livestock ownership in Orissa: Livestock ownership and land possession	6
Table 5: Ownership of productive dairy animals and rural land ownership	7
Table 6: Ownership of productive cows and Rural Land Ownership in Andhra Pradesh	7
Table 7: Ownership of productive cows and rural land ownership in Orissa	8
Table 8: Household possession of large ruminants in rural areas	8
Table 9: Selected household attributes and ownership of large ruminants in rural India	9
Table 10: Small animals and rural land ownership	9
Table 11: Market prices for livestock products in Orissa	10
Table 12: Indian meat consumption: Market shares of various meats (Percent) (Mehta et al. 2002)	11
Table 13: Percentage of households consuming meat, fish, and eggs 1993-1994 (Mehta et al. 2002)	11

PREFACE

This is the ninth of a series of Working Papers prepared for the Pro-Poor Livestock Policy Initiative (PPLPI). The purpose of these papers is to explore issues related to livestock development in the context of poverty alleviation.

Livestock is vital to the economies of many developing countries. Animals are a source of food, more specifically protein for human diets, income, employment and possibly foreign exchange. For low income producers, livestock can serve as a store of wealth, provide draught power and organic fertiliser for crop production and a means of transport. Consumption of livestock and livestock products in developing countries, though starting from a low base, is growing rapidly.

This paper analyzes the political economy of the livestock sector in two Indian states, Andhra Pradesh and Orissa. The aim is to identify politically feasible interventions that could have broad positive effects on poor rural livestock producers in these states. To that end, the paper assesses the relationship between land, livestock, and poverty, describes the organization of the sector, and analyzes the political and bureaucratic interests shaping livestock policy.

We hope this paper will provide useful information to its readers and any feedback is welcome by the author, PPLPI and the Livestock Information, Sector Analysis and Policy Branch (AGAL) of the Food and Agriculture Organization (FAO).

Disclaimer

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Keywords

India, Orissa, Andhra Pradesh, policymaking, livestock, rural development, poverty.

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ABBREVIATIONS

AMUL	Anand Milk Union Limited
BJP	Bharatiya Janata Party
CPRs	common property resources
FARD	Orissa Department of Fisheries and Animal Resources Development
GATT	General Agreement on Tariffs and Trade
GCMMF	Gujarat Cooperative Milk Marketing Federation
GDP	gross domestic product
IAS	Indian Administrative Services
IDC	Indian Dairy Corporation
ISNRMPO	Indo-Swiss Natural Resource Management Program-Orissa
MACs	Mutually Aided Cooperative Societies Act of Andhra Pradesh
MMPO	Milk and Milk Products Order
NDDB	National Dairy Development Board
NGO	Nongovernmental organization
OF	Operation Flood
OLRDS	Orissa Livestock Resource Development Society
OLSP	Orissa Livestock Sector Policy
OMFED	Orissa State Cooperative Milk Producers' Federation
PRIs	Panchayati Raj institutions
RSS	Rashtriya Swayamsevak Sangh
SIDA	Swiss Agency for International Development
TDP	Telegu Desam Party

EXECUTIVE SUMMARY

This paper analyzes the political economy of the livestock sector in two Indian states, Andhra Pradesh and Orissa. The aim is to identify politically feasible interventions that could have broad positive effects on poor rural livestock producers in these states. To that end, the paper assesses the relationship between land, livestock, and poverty, describes the organization of the sector, and analyzes the political and bureaucratic interests shaping livestock policy.

A review of available data on livestock ownership, land, and poverty shows that sectoral interventions must be carefully tailored to have pro-poor effects. Although livestock holdings are widely distributed in Andhra Pradesh and Orissa, as elsewhere in India, land ownership and livestock holdings are correlated. Poor livestock producers tend to own little or no land; these producers are often of low social status as well. Smallholders and landless households differ from other households in the mix of animals that they own and their means of supporting these animals. Poor livestock producers own fewer large ruminants (cows and buffaloes); they are more likely to possess small ruminants (goats and sheep) and backyard poultry. Poor producers are also more heavily dependent on common property resources—village pastures, water tanks, and local forests—for the feed and fodder their animals need.

The distribution of benefits from sectoral interventions is shaped by these factors. The impact of a dairy sector intervention will depend upon the resources required to benefit from it; poor producers are unlikely to benefit from an intervention that requires land or financial resources. For example, improvements in the functioning of dairy cooperatives benefit all producers who own dairy animals. Provision of fodder seeds, on the other hand, is likely to benefit only those with arable land in which to sow the seeds. Measures that improve common resources or focus on small ruminants are likely to benefit poor producers.

Livestock policy options are constrained by the broader political context. Because livestock producers are not an organized political lobby, policy in this area is shaped by broad policy trends and the agendas of more organized groups. Historically, livestock sector policy has focused on large ruminants and the state has sought to deliver necessary supportive services. This approach follows from the high political salience of Hindu nationalism and a deeply embedded statist approach to policy in the post-Independence period. Hindu nationalist groups have encouraged emphasis on vegetarian-friendly livestock policies—promote dairy rather than meat—and placed constraints on cow slaughter. Statist beliefs led the state to view provision of animal health and breeding services as a state responsibility and facilitated direct intervention in the cooperative sector. Recent sector reform policies reflect the broad ideological shift towards liberalism of the last decade. Reforms have opened the formal dairy market to private companies and imposed user charges for health services. Reformers also seek to reduce government involvement in cooperatives and propose to privatize veterinary practice. Such reforms place greater faith in the ability of the market to allocate services and goods. It is argued that reform implementation will be shaped by interested actors, such as state-employed veterinarians, as well as market forces. Other policy trends, such as forest closure and decentralization, have affected the livestock sector. All of these reforms will affect poor livestock producers—the paper discusses the likely effect of each reform—, but livestock producers have played little role in their development. However, those cases in which livestock sector actors have organized, as in the case of sheep and goat rearers in Andhra Pradesh and dairy cooperative sector leaders at the national level, demonstrate that actors can influence the content and implementation of sector policy within the broad constraints set by the political context.

Based on this analysis, the paper discusses several options for strategic intervention in the livestock sector. The interventions with the greatest potential are the following.

One, actors can seek to improve producers' capacity to articulate and advocate their interests. Two, actors can seek to increase access to shared resources such as forests and pastures. Three, actors can encourage pro-poor implementation of animal health service reforms. Four, actors can advocate further liberalization of the dairy sector. Five, actors can support small ruminant production by improving feed and fodder and conducting research on commodity chains and breeding.

INTRODUCTION

The livestock sector has significant potential for improving the livelihoods of landless people and small and marginal farmers, who comprise the majority of India's rural poor. Many poor rural Indians own livestock and gain some income from it. At present, resource and institutional constraints prevent poor producers from realizing the full potential of their animals. Expansion in the domestic livestock products market presents an opportunity for gain. Forecasters believe that domestic demand for dairy and meat products will grow substantially in the near future (Delgado et al. 1999). Strategic intervention is required to ensure that poor producers secure a greater share of the benefits from this expanding market.

This paper analyzes the livestock sector in Andhra Pradesh and Orissa, situating these cases in the national context. These states were selected because they are actively pursuing sectoral development and reform; they do not represent the full diversity of India's livestock production systems, agroclimatic conditions, or political environments and are not meant to be representative in this sense.¹ Close attention to these cases can contribute to effective interventions in these states and elsewhere in India. Dairy and meat marketing, fodder and grazing issues, and animal health services are relevant throughout India. The analysis focuses on poor rural livestock producers; this paper does not investigate the impact of policies on livestock consumers or peri-urban livestock producers.

Throughout, the paper highlights key factors affecting the political, social, and economic environment in which poor rural livestock producers attempt to secure a livelihood. The central concern is the interaction between the animals producers raise—cows, buffaloes, sheep, goats, poultry—and their environment rather than on divisions among poor producers.² The aim is to identify leverage points with potential for broad positive effects on poor producers. Thus, the analysis presents broad generalizations regarding issues such as caste, land ownership, and local politics. Although little space is devoted to the complexities of these issues, the analysis seeks to be sensitive to the differential policy effects that may arise from characteristics such as remote location or social disadvantage.

The paper is structured as follows. Section I provides an overview of the relationship between land, livestock, and poverty in India, Andhra Pradesh, and Orissa. This overview highlights the two parts of the sector with greatest potential for pro-poor interventions: dairy and small ruminant meat production. Section II provides an overview of the livestock sector. The political context surrounding livestock policy is discussed, highlighting constraints imposed by 'cow' politics, and the dominant policy approach and the organization of service delivery, processing, and marketing to 1991 are described. The actors and interests served by that system are identified. Section III focuses on sector reform efforts since 1991, the year in which the Government of India committed the country to market liberalization. Recent reform efforts in India, Andhra Pradesh, and Orissa are summarized, implementation prospects are analyzed, and their potential impact on poor livestock producers is evaluated. Because there are important linkages between state and national reforms, the discussion is ordered by theme rather than state or level of government. The concluding section reviews several options for strategic intervention, describing and analyzing their prospects. It is recommended that actors focus on improving producers' capacity to articulate and advocate their interests, increasing access to shared resources such as forests and pastures, encouraging pro-poor implementation of animal health service reforms, advocating further liberalization of the dairy sector, and gathering information on small ruminant commodity chains and breeding.

¹ Andhra Pradesh and Orissa are neighbouring states in eastern India.

² This paper does not analyze the distribution of benefits or division of responsibilities within poor livestock producing households, and thus it neglects gender issues. See the following for extensive discussion of these issues (Katticaren 2000; Bravo-Baumann 2000; Pradhan, Ahuja, and Venkatramaiah 2003; Ramdas and Seethalakshmi 1999).

SECTION I: LAND, LIVESTOCK, AND POVERTY IN INDIA, ANDHRA PRADESH AND ORISSA

India has 36 percent of the poor people in the world.³ About 433 million Indians (44 percent) lived on less than \$1 a day in 1997 (World Development Indicators 2000). Official statistics classified roughly 36 percent of the population as poor in 1993-1994. Indian poverty is largely a rural phenomenon. About 75 percent of the poor reside in rural areas (World Bank 2001). Roughly 33 percent of rural residents were considered poor by the Government of India in 1991, as compared to 18 percent of urban residents (Drèze and Sen 1995). Table 1 presents information on urban and rural poverty in Andhra Pradesh and Orissa. Most locate the causes of rural poverty in slow agricultural growth rates, low factor productivity, and inequitable access to land and other inputs (Mearns 1999).

Table 1: Poverty in Orissa and Andhra Pradesh.

	# of households	% of individuals who are		Head count ratio of poverty		
		Scheduled Castes	Scheduled Tribes	All	Scheduled Castes	Scheduled Tribes
Rural Andhra Pradesh	4,908	19.3	9.5	27.7	43.8	41.2
Urban Andhra Pradesh	3,644	8.5	2.8	36.1	41.0	43.7
Rural Orissa	3,338	18.5	25.2	51.9	57.2	76.9
Urban Orissa	1,037	13.1	11.9	39.7	45.5	61.6

Poverty rates are based on the official poverty line. This poverty line is state-specific and is derived separately for rural and urban areas.

Source: Household level data, 50th round of NSS Consumer Expenditure Survey 1993-94 (Meenakshi, Ray, and Gupta 2000).

Rural poverty is closely linked to land ownership and to social status. Approximately 84 percent of rural Indian households operate less than 2 hectares of land; the other 16 percent operate almost 66 percent of the land (See Table 2).⁴ Land may be distributed more inequitably than official figures suggest as some large landholders distributed formal ownership among family members to evade land ceilings. Many households own too little productive land to rely solely on its products for subsistence. However, those households that manage to secure a livelihood from their land are less likely to be poor than those dependent on agriculture wage labour (Agarwal 1994). There is little reason to expect a dramatic shift in land distribution in the short term.

³ The figures reported in this paragraph are not wholly consistent. Poverty figures depend on the measures used, the population sampled, and a host of other factors. There is an active debate on appropriate measures and poverty trends in India.

⁴ Of course, quantitative data on land ownership and operation tells us little of its quality; an acre of irrigated land and an acre of rain-fed land are not the same.

Table 2: Rural land ownership.

Percentage distribution of households and area operated by size class of operational holdings						
	India		Andhra Pradesh		Orissa	
	Percent of households	Percent of operated area	Percent of households	Percent of operated area	Percent of households	Percent of operated area
Landless (0-.002 ha)	21.8	-	37.5	-	27.2	-
Marginal (.002-1 ha)	48.3	15.5	36.9	17.5	43.5	22.0
Small (1-2 ha)	14.2	18.6	13.3	23.0	17.9	30.3
Semi-Medium (2-4 ha)	9.7	24.2	8.4	26.5	8.8	27.8
Medium (4-10 ha)	4.9	26.5	3.4	23.6	2.5	16.3
Large (>10 ha)	1.1	15.2	0.5	9.5	0.2	3.7

Source: 48th NSS Land and Livestock holdings survey, 1991-1992 (National Sample Survey Organisation. Department of Statistics. Government of India. 1997).

Table 1 presents information on the relationship between social status and poverty. Low caste and out caste status continues to be correlated with poverty. The populations of Andhra Pradesh and Orissa comprise a substantial proportion of dalits (scheduled castes) and adivasis (scheduled tribes).⁵ Dalits are present in most districts, but adivasis are concentrated in the forest, mountainous, and remote areas. Much of the land in which adivasis reside is owned by the state, at least formally, or controlled by non-adivasis (Mohanty 1997). Thus, producers in these areas do not have full control over the land used for livestock production. The 1991 census listed 62 distinct adivasi groups in Orissa. Although the table does not provide data on nomadic communities, informants indicated that there are pastoralist and sedentarized communities in Andhra Pradesh. Pastoralists tend to possess a greater number of livestock per capita than other groups. Pastoralist communities often lack political influence, but they are not necessarily poor by standard measures (Agrawal 1999).

For the most part, land ownership and social caste continue to serve as indicators of political influence or lack thereof. Despite increased mobilization by dalits and adivasis in recent decades, research in Andhra Pradesh and Orissa indicates that large land owners and upper caste individuals continue to exert disproportionate influence in local, district, and state level decisions (Reddy 1989; Manor 2000; Mohanty 1996). Poor rural livestock producers tend to own little arable land and often come from socially marginalized groups.

Both land ownership and social caste are relevant to livestock production. The amount of land one owns affects one's ability to support livestock. Those with ample private lands have greater crop residues and may be able to raise fodder crops. Most producers, however, depend partially or wholly on crop residues and common property resources—such as village pastures, tanks, and local forests. Jodha's classic study found that 84 to 100 percent of poor households in dry regions were dependent

⁵ The terms Scheduled Caste and Scheduled Tribe are used to refer to those historically marginalized groups that are granted special protections in the Constitution. Scheduled castes refers to "untouchables" and scheduled tribes refers to "tribal" peoples. Dalit and adivasi are the terms contemporary representatives of these groups use most frequently.

on common property resources (CPRs) for food, fuel, fodder, and fibre while only 10 to 28 percent of large farmers gathered these items from common areas (Jodha 1986). Animal grazing in CPRs accounted for 69 to 89 percent of grazing for livestock owned by poor households and 11 to 42 percent of grazing from rich households. That study, and many others, also found that the quantity and quality of common lands has declined substantially since Independence.

Social caste affects livestock production by constraining access to services and resources. Higher caste individuals are frequently unwilling to provide services to low/out-caste livestock producers because contact with "untouchables" is perceived to pollute oneself. However, out-caste individuals may provide services to higher caste individuals if they observe proper protocol. Ethnicity may also influence dietary practices and thus local markets. Informants indicated that adivasis in Orissa were generally non-vegetarian and consumed less milk than non-adivasis (Mittal et al. 1999). Thus, one would expect a stronger local market for meat in mostly adivasi areas. The potential for dairy would depend on access to nonlocal markets but should be lower than in milk-consuming areas.

Historically, livestock were integrated into a mixed agricultural-livestock system. Livestock tilled fields, fed on crop residues, and fertilized the fields with their manure; and provided milk and meat for household consumption, celebrations, and religious festivals.⁶ As farmers have become more integrated into markets, sale of livestock products has come to comprise a significant share of household incomes. Kurup (2003) estimates that livestock comprises 30 percent of household income in Orissa; agricultural or wage income remains primary for most. Income from livestock can balance that from agriculture. Agricultural income is episodic and depends on a successful season. Dairy can provide regular income and meat animals provide a ready source of cash on demand.

In 1999-2000, livestock comprised 5.5 percent of India's gross domestic product (GDP).⁷ While this figure is dwarfed by the total contribution of agriculture (24.85 percent), livestock's share in the agricultural GDP has grown slightly over time. The gross value of livestock sector output was about Rs. 130,234 crore; the GDP of the livestock sector comprised Rs. 984 billion (roughly US\$22.6 billion).⁸ Dairy products garner the greatest proportion of output value (64.6 percent); meat and meat products accounted for 18.5 percent of output value. Other outputs include dung (8.6 percent), eggs (3.3 percent) and hair or fibre products (8.6 percent). The majority of livestock products are consumed domestically. In 1999-2000 livestock export earnings were only Rs. 2,000 crore (US\$460 million). Meat and meat products and leather and leather products comprise more than 90 percent of livestock sector exports. Analyses indicate that substantial reductions in international trade barriers and improvements in domestic processes (disease control, packaging, etc) would be required for India to gain a larger share of world markets (Sharma and Sharma 2002; Sharma and Gulati 2003). Small producers are unlikely to play a major role in production for export in the near term.⁹

As Tables 3-10 demonstrate, livestock ownership is distributed less inequitably than arable land. The majority of livestock are held by smallholders operating less than 2 hectares of land. Many landless households own some livestock. However, there is a

⁶ Sale of animal fibres (wool) and skin (leather) is not an important source of income in Andhra Pradesh and Orissa.

⁷ Sources: Website of the national Department of Animal Husbandry & Dairying (cited as GOI 2003b-d), Sharma and Sharma (2002), and GOI (2003a).

This figure excludes animal (draught) power, which was valued at Rs. 4,000-9,500 crore (Government of India. Planning Commission 2002). Some experts believe this figure to be low. One crore = 10 million (10,000,000)

⁸ As of January 1, 2000, US\$1 = Rs. 45.98.

⁹ Some dairy cooperatives, such as GCMMF market dairy products abroad. However, these sales comprise a small share of their total earnings.

positive relationship between land and livestock ownership. This pattern is most evident for large ruminants (cattle and buffalo). A much smaller proportion of landless households than households with medium to large holdings had dairy animals that were giving milk during the 1993-1994 National Sample Survey (See Table 5). Inequity in large ruminants is less evident in Orissa than Andhra Pradesh. There were at least 10 productive animals for every 100 households at every land possession category in Orissa while there were only 6 in-milk buffaloes for every 100 landless households in Andhra Pradesh.

Goats are frequently referred to as "small man's cow;" this label aptly reflects the profile of most goat owners, who possess, on average, less than a hectare of land per household. The landless are better represented among sheep and goat producers than among dairy producers. Reliance on sheep and goats may reflect a decline in the common resources on which landless households and smallholders depend; goats are able to survive on degraded land where cows would not survive (Jodha 1991). The figures regarding poultry ownership should be treated with caution for it is not clear whether this data reflects the effects of the "poultry revolution" in which intensive poultry production became widespread.

Table 3: Land and livestock ownership in Indian rural areas.

	Possession of milch animals						Possession of draught animals			
	Cows only	Buffalos only	Cows & Buffalos	Others	None	Not recorded	A pair or more	Single	None	Not recorded
Landless (0-.01 ha)	7%	6%	1%	0%	82%	4%	1%	2%	96%	0%
Marginal (.01-1.0 ha)	22%	15%	4%	0%	55%	4%	18%	9%	73%	0%
Small (1-2 ha)	33%	24%	9%	0%	31%	3%	43%	12%	45%	0%
Semi-medium (2-4 ha)	32%	28%	14%	0%	23%	3%	51%	12%	37%	0%
Medium & Large (4.01 + ha)	27%	28%	27%	0%	14%	4%	54%	14%	32%	0%
All households	22%	16%	6%	0%	53%	4%	21%	8%	70%	0%

Source: NSS 50th Round, Quinquennial survey of consumer expenditures.

Table 4: Equity in livestock ownership in Orissa: Livestock ownership and land possession.

Landholding	Proportion of Households	Proportion of Cattle	Proportion of Buffalo	Proportion of Sheep & Goat	Proportion of Pigs	Proportion of Poultry
Landless (0-.002 ha)	27.2	8.62	0.00	25.08	0.00	44.66
Marginal (.002-1 ha)	43.5	64.79	22.75	51.04	25.49	39.49
Small (1-2 ha)	17.9	17.73	28.57	11.37	31.37	8.01
Semi-Medium (2-4 ha)	8.8	5.83	14.29	8.26	31.37	4.53
Medium (4-10 ha)	2.5	2.64	33.33	3.43	11.76	2.49
Large (>10 ha)	0.2	0.22	1.06	0.05	0.00	0.82

Source: Land data is from 48th NSS Land and Livestock holdings survey. Livestock data are from Orissa LSR Field Survey 1999 (Kurup 2003).

Table 5: Ownership of productive dairy animals and rural land ownership.

In-milk large ruminants owned per 100 households						
	Andhra Pradesh			Orissa		
	Xbred Cows	Desi Cows	Buffalo	Xbred Cows	Desi Cows	Buffalo
Revised Landless	-	-	6	1	11	-
Marginal	3	29	41	5	20	2
Small (1-2)	2	20	55	3	39	3
Semi-Medium (2-4)	3	28	56	7	26	2
Medium (4-10)	5	18	74	6	42	11
Large	4	16	126	0	69	0

Source: 48th NSS Land and Livestock holdings survey, 1991-1992.

Table 6: Ownership of productive cows and Rural Land Ownership in Andhra Pradesh.

Adult female cows owned per 100 households								
Size Class of Household operational holding	Not calved once		In-milk		Dry		Others	All
	Xbred	Desi	Xbred	Desi	Xbred	Desi		
Revised Landless	3	-	-	-	-	-	2	-
Marginal	80	-	-	3	29	3	10	2
Small (1-2)	89	0	1	2	20	2	11	3
Semi-Medium (2-4)	114	0	1	3	28	2	9	1
Medium (4-10)	85	0	0	5	18	2	13	4
Large	72	0	0	4	16	6	14	3

Source: 48th NSS Land and Livestock holdings survey, 1991-1992.

Table 7: Ownership of productive cows and rural land ownership in Orissa.

Adult female cows owned per 100 households								
	Not calved once		In-milk		Dry		Others	All
	Xbred	Desi	Xbred	Desi	Xbred	Desi		
Revised Landless	0	0	0.5	11	0.5	1.5	0.5	13.5
Marginal	0	6	5	20	3	34	3.5	70.5
Small (1-2)	0	4	3	39	2	56	3	108
Semi-Medium (2-4)	0	3	7	26	5	39	6	86
Medium (4-10)	2	0	6	42	9	52	6	118
Large	0	0	0	69	0	95	75	239

Source: 48th NSS Land and Livestock holdings survey, 1991-1992.

Table 8: Household possession of large ruminants in rural areas.

	Possession of milch animals					Possession of draught animals				
	Cows only	Buffalos only	Cows & Buffalos	Others	None	Not recorded	A pair or more	Single	None	Not recorded
All-India	22%	16%	6%	3%	53%	0%	21%	8%	70%	0%
Andhra Pradesh	8%	17%	3%	0%	73%	0%	17%	4%	79%	0%
Orissa	29%	2%	1%	1%	68%	0%	32%	8%	60%	0%

Source: NSS 50th Round, Quinquennial survey of consumer expenditures.

Table 9: Selected household attributes and ownership of large ruminants in rural India.

	Possession of milch animals					Possession of Draught Animals				
	Cows only	Buffalos only	Cows & Buffalos	Others	None	Not recorded	A pair or more	Single	None	Not recorded
Agricultural Labour	16%	9%	2%	4%	68%	0%	10%	6%	84%	0%
Self-employed in Agriculture	31%	27%	12%	3%	28%	0%	42%	12%	45%	0%
Scheduled Tribes	26%	7%	4%	5%	59%	0%	35%	10%	56%	0%
Scheduled Castes	19%	12%	3%	5%	61%	0%	13%	7%	80%	0%

Source: NSS 50th Round, Quinquennial survey of consumer expenditures.

Table 10: Small animals and rural land ownership.

	Animals owned per 100 households			
	Andhra Pradesh		Orissa	
	Sheep & Goats	Poultry	Sheep & Goats	Poultry
Revised Landless	21	125	55	489
Marginal	119	221	70	316
Small (1-2)	145	191	75	312
Semi-Medium (2-4)	121	293	112	373
Medium (4-10)	156	237	167	696
Large	18	167	259	2642

Source: 48th NSS Land and Livestock holdings survey, 1991-1992.

Inequity in ownership of livestock has important implications for pro-poor interventions. Because the majority of livestock are owned by small holders and landless people, almost any intervention that benefits livestock producers can be said to be pro-poor. This view is often advanced in policy documents and was by several informants. But it is not the case that all livestock producers will benefit equally from intervention. Factors affecting the distribution of benefits from an intervention include the animals included, the risk involved, and the other inputs required to benefit from the intervention. For example, improvements in the functioning of dairy cooperatives benefit all producers who own dairy animals. Provision of fodder seeds, on the other hand, is likely to benefit only those with arable land in which to sow the seeds.¹⁰ The livestock most commonly raised in Andhra Pradesh and Orissa are discussed briefly in the paragraphs that follow.

Animals differ substantially in the investment required and the potential profit. Table 11 provides information regarding local market prices in Orissa. Large ruminants are raised primarily for dairy products and draught power. Dairy animals require a greater

¹⁰ The ILRI Project on Multiple Use Crops could diminish the trade off between food crops and fodder crops.

investment in cash (purchase) and need more feed, fodder, and time to reach productivity. In return, they offer a steady income that may be quite substantial. Dairy producers located in areas served by a cooperative system receive a regular payment for their milk throughout the year; producers may also sell to informal traders or private companies. Because cooperative payments are based on milk fat ratios, buffalo milk is more profitable than cow milk. The potential for profit appears to be greater for dairy than meat animals, although this is limited by difficulties in disposing of unproductive cows (See Section II). Draught animals also require a substantial investment, and ownership may seem uneconomic for small holders who make use of the animals for only a small proportion of the year (See GOI-NLP 1996: 4.3, Kurup 2003: Chapter 4). However, access to draught power is critical during the tilling period. In the absence of lease markets that serve small and marginal farmers at those times, many will choose to retain draught animals.

Table 11: Market prices for livestock products in Orissa.

	Local Market Price	Notes
Milk	Rs. 6-10/litre	
Goats	Rs. 700-900	Weight ~10-15 kg. Body weight is not publicly assessed.
Sheep	Rs. 500-600	Weight ~10-15 kg.
Pigs	Rs. 1200-1500	Weight ~50 kg.
Poultry	Rs. 50-80/kg	Most sales occur within the village
Dung	Rs. 80-100/cartload	

Source: Field study of livestock practices in Orissa (Mittal et al. 1999).

The domestic market for meat is substantial; about 68 percent of Indians are not vegetarian (Mehta et al. 2002). Tables 12 and 13 present information on Indian meat consumption. For the most part, rearing meat animals requires less investment from producers. The most common meat animals in the case study states were goats,¹¹ sheep, and poultry. These small animals are less expensive to purchase and require less feed and fodder to gain sufficient weight to be profitably marketed. The profit from meat animals depends in part on time of sale; meat animals are most profitable during the wedding and festival seasons.

¹¹ Goat milk does not comprise a significant share of marketed milk in Andhra Pradesh or Orissa.

Table 12: Indian meat consumption: Market shares of various meats (Percent) (Mehta et al. 2002).

Year	Beef	Buffalo	Mutton/Lamb	Goat	Pork	Poultry
1978	34	34	6	12	10	4
1988	33	32	5	13	10	7
1998	31	31	4	10	10	13
2001	30	30	3	8	7	22

Source: FAO Production Yearbook.

Table 13: Percentage of households consuming meat, fish, and eggs 1993-1994 (Mehta et al. 2002)

State	Rural				Urban			
	Goat	Poultry	Fish	Eggs	Goat	Poultry	Fish	Eggs
Andhra Pradesh	22.4	18.4	25.9	52.3	20.3	19.4	20.6	57.2
Orissa	14.2	9.1	58.6	12.2	41.3	6.2	63.7	34.2
All India	20.3	7.5	30.7	22.0	28.0	9.0	27.1	34.9

Source: National Sample Survey.

Since the “poultry revolution,” organized intensive production has come to dominate markets for eggs and broilers. Participation in intensive poultry requires a substantial investment in pedigreed birds, facilities, cages, and purchased feed. Mehta et al (2002) describe a small farm as one with 3,000-10,000 birds. This subsector is dominated by “gentleman farmers” as one informant described them. However, many smallholders have continued to raise backyard poultry for profit. The persistence of backyard poultry may reflect the spatial concentration of intensive poultry. Intensive poultry producers have focused on the urban market, and many of these producers are located in peri-urban areas where transport is easier. Over time, however, intensive producers may capture rural markets as well. Because the potential of backyard poultry appeared to be limited by the intensive poultry sector, this sub-sector did not receive close examination.¹²

Observers often describe the Indian livestock production system as low input, low output, but nevertheless it could be argued that this system is highly efficient. Most producers expend little cash on food for their animals. Instead of stall feeding or raising fodder-specific crops, producers let their animals forage for fodder in harvested fields, village pastures, local forests, and along roadsides, either with a herder or on their own.¹³ This system is perceived as low output by conventional measures¹⁴ such as litres of milk produced, animal weight at sale, and one would expect livestock to be more productive when provided with a better diet. Ahuja, Morrenhoff and Sen’s 2002 study of livestock-owning households in Orissa provides suggestive evidence. They report that average annual milk production for in-milk

¹² Some argue that backyard poultry may be able to survive competition with intensively produced broilers. At present, it seems, backyard poultry command a price premium for their superior taste. Backyard poultry producers are unlikely to compete successfully with intensively produced layers because fertilized eggs do not travel well.

¹³ There is, of course, substantial regional variation in livestock rearing practices. Use of stall feeding and purchased feed is more common in places where cooperative dairy is very successful.

¹⁴ These indicators may exclude other factors important to small producers.

crossbred cows was 850 litres for the poorest 20 percent of households and 1219 litres for the top 20 percent.¹⁵ It is due to the fact that the richer households provide their animals with superior inputs. Extension may improve producers' awareness of animal needs, but it is not clear that small producers have sufficient resources to garner these inputs.¹⁶

The section that follows focuses on the politics and institutional structure of the livestock sector—including dairy, meat, and health services. The dairy and meat subsectors are the only ones in Andhra Pradesh and Orissa that have both substantial participation by poor rural producers and high potential for benefit. The return from all types of livestock is constrained by lack of access to animal health and breeding services, by the structure of the market, and by the inputs (feed and fodder) received by livestock. Discussion of inputs—which are most affected by policies and organizations not focused on livestock—begins in Section III.

¹⁵ It should be noted that Orissa has the lowest bovine milk productivity in India. The authors were interested in demand for livestock services and thus restricted their sample to households that own livestock; an asset index was used to determine household wealth. Crossbred cattle comprised a smaller share of cattle stock in the poorest households (about 6 percent) than in the richest households (close to 10 percent).

¹⁶ Whether small producers could provide better inputs would depend on factors such as the size of investment required, the cost/benefit ratio, and access to credit. Productivity might also increase if producers were to shift breeds. This issue is discussed further in subsequent sections.

SECTION II: SECTORAL OVERVIEW

Livestock policy has rarely been a high priority for ambitious politicians and bureaucrats in Andhra Pradesh and Orissa. Livestock comprises a small share of GDP and a small percentage of state investment (0.4-1.0%). Although livestock producers comprise a substantial share of the population, they are not an important, organized political interest group. Strategic political entrepreneurs are more likely to use identity (as Hindu, Muslim, dalit, adivasi) or their primary livelihood (agriculture) as a catalyst for mobilizing producers. There is little reason to believe that producers' votes for state and national candidates are based on their livestock policy platforms. Although there is greater scope for self-organization and advocacy on behalf of producers (see Section IV), it is unlikely that the sector will garner the attention devoted to telecommunications, energy, or caste reservation policies.

Despite the low political profile of livestock, India's political economy has an immense impact on the sector. Caste hierarchies and religious divisions shape the options policymakers consider, the priorities of bureaucrats and service providers, and the strategies producers adopt. Since Independence, formal Indian livestock policy largely has been driven by dairy—and thus by cows and buffalos. The Anand model, extended through Operations Flood I, II, and III, and breeding interventions have attracted the attention of researchers, policy makers, and donors. Yet the political economy of Indian livestock should not be reduced to large ruminants. Cow and dairy politics are an important part of the sector—and are discussed in the following section—but so are goat politics, vaccination politics, and trade and liberalization politics. This sectoral overview begins with a brief discussion of 'cow' politics. It then shifts to major sector-specific interventions and the organizational structure that has resulted. Discussion of policies in related sectors—such as fodder and grazing—is reserved for Section III.

'Cow' politics

Although the Indian state is secular, there have been organized constituencies seeking a Hindu rashtra (state) since shortly after Independence (Graham 1990; Jaffrelot 1996). The Hindu nationalist Rashtriya Swayamsevak Sangh (RSS) has been associated with the Jana Sangh family of parties, of which the governing Bharatiya Janata Party (BJP) is a descendent. The right of centre BJP has led the national government for most of the period since 1996. It is closely allied with nationalist groups and has astutely used Hindu nationalist rhetoric to attract followers, allying with regional parties in areas where the appeal of Hindutva (Hinduness) is limited (Kohli 1998; Pai 1998; Thakur 1998).¹⁷ Although the BJP has moderated its nationalist rhetoric somewhat since the early 1990s, Hindutva remains a central part of the party's identity. It is thus understandable that politicians and bureaucrats have been reluctant to adopt policies that conflict with popular understandings of Hinduism.¹⁸ Most relevant to livestock policy are the special symbolic accord granted to cows and the association of vegetarianism with high caste (purity) and meat consumption with low caste.¹⁹ Cow slaughter is seen to be contrary to Hindu religious dictates, and

¹⁷ The Bharatiya Janata Party is the largest party within the ruling National Democratic Alliance. The BJP's strongest political support comes from the "Hindi heartland" of Uttar Pradesh, Bihar, and Madhya Pradesh and its outskirts—Gujarat, Maharashtra, and Rajasthan. The BJP garnered 25.6 percent of all votes in the 1998 elections but controlled 40.6 percent of the vote with its allies, enough to form a government.

¹⁸ This discussion draws from Robbins (1999) and field observations and interviews.

"Popular" may be a misleading term; there is little empirical work on perceptions of meat consumption. Scriptural and historical analyses indicate that the relationship between Hinduism and meat consumption is more complex than Hindu nationalists suggest (see cites in Noronha 1994; Robbins 1999).

¹⁹ Kala (1994) estimated that 30 percent of Indian Hindus were nonvegetarian (cited in Robbins 1999). Experts expect meat consumption to rise over time.

some Hindus regard beef consumption as sacrilegious. Open cow slaughter is rare in most parts of India.²⁰ It seems that social pressure has been sufficient to prevent non-Hindus (such as Muslims, Christians) from openly engaging in this practice.

Despite its rarity, cow slaughter has served as a symbolic issue for Hindu nationalists. The Constitution directs the State to take steps to prohibit cow slaughter (Art. 48). Nationalist groups have sought enactment of cow slaughter bans in each state and by the central government for several decades (see Robbins 1999). Cow slaughter is illegal in Andhra Pradesh and Orissa. State laws tend to be more severe in northern and western states (GOI-NLP 1996). News reports indicate that a national ban on cow slaughter is under consideration by the BJP.

There is little prospect for a near term shift away from anti-cow slaughter policies. There is no organized constituency for cow slaughter and little incentive for creating one because laxity in enforcement of cow slaughter bans allows those who desire to consume beef to do so discretely. Those who wish to slaughter beef openly in northern India must weigh the costs of the communal violence it could catalyze. Hindu-Muslim conflict has led to hundreds of deaths in the last decade. Non-Hindus do not seem to view this issue as worth the controversy.²¹ Non-vegetarians can openly purchase poultry, chevron (goat), mutton, lamb, pork, and buffalo, and consume beef discretely.

Social and legal barriers to cow slaughter have important consequences for the livestock sector. First, the ban poses a serious barrier to breed improvement and population control.²² Breed improvement generally involves selection for superior animals—those who perform best in the areas of concern (e.g., milk production, draught power). Animals whose performance is inferior are usually culled or prevented from reproducing. Slaughter bans remove the option of culling,²³ and castration does not appear to be widespread.²⁴ Instead, unproductive animals often are abandoned by their owners and left to wander. These animals consume scarce fodder and may continue to reproduce. Illegal slaughter produces low-quality beef for local consumption. Other animals are smuggled along the informal trade routes to neighbouring countries (Bangladesh), ports (Kolkatta, Mumbai) or states where slaughter is legal (Tamil Nadu and Kerala); this however does not seem to be highly profitable for producers.

Second, barriers to cow slaughter reduce the incentive for raising cattle (Noronha 1994; Robbins 1999). Because use is limited to dairy and draught power—and it is difficult to dispose of useless animals—investment in cattle may be less profitable than in other animals such as buffaloes.²⁵ The sanctions against cow slaughter have been sufficient to prevent the production of cattle and buffalo for meat in India (GOI-NLP 1996); most bovine meat is residual and of low quality.

Third, the social stigma attached to slaughter imposes substantial humanitarian costs on some communities. Dalits have traditionally been held responsible for disposal of dead cattle; this task provides one rationale for untouchability. Because this task is

²⁰ Cow slaughter and beef consumption are legal in Kerala, which has a substantial Christian population. Slaughter is legal in Tamil Nadu. Southern and eastern slaughter laws often permit some slaughter of unproductive animals (GOI-NLP 1996).

²¹ Noronha comments “to the BJP’s dismay the passing of the recent cattle protection bill [in Delhi] did not raise even a semblance of protest from the Muslims.” (1994: 1448)

²² Most of the interviewees with a concern for breed improvement raised this issue without prompting.

²³ The National Livestock Sector Policy Review notes that liberal slaughter laws permit slaughter of the unproductive. In practice, this has meant “the old and the infirm, sterile or infertile female, and ... malnourished” (Section 4.2.2). Young cattle whose performance is substandard are unlikely to fit these criteria.

²⁴ A few informants suggested that humane castration could be consistent with Hinduism.

²⁵ Whether this is true in practice would depend on local conditions such as available fodder, the productivity of cattle, and the market for dairy as compared to meat.

socially stigmatized, however, neither veterinarians nor human health professionals have devoted attention to addressing the health risks posed by this trade. The recurrent outbreaks of anthrax among dalits in Orissa are evidence of their continued marginalization.²⁶

Cow slaughter politics set the context in which state livestock sector policies developed. The section that follows discusses the most important state interventions and analyzes their impact on livestock production, processing, and marketing. These interventions have focused on the market for dairy and animal health and breeding services. There has been very limited government investment in extension; efforts to increase producers' awareness and skills have been extremely limited. All of these sectors influence the welfare of poor rural livestock producers.

State involvement in cooperative dairy

The most important state and central government interventions in the livestock sector involve the market for milk. The Anand (Gujarat) experience provided the basis for state policies, and thus this section begins with a brief summary of the Anand story.²⁷ Dairy cooperative societies in Gujarat first developed from the bottom-up. Local producers in Anand organized themselves to resist exploitation from a British trader. With assistance from an astute engineer—Verghese Kurien—farmers gradually developed a cooperative model that enabled rural producers to supply urban milk markets (initially Bombay now Mumbai) without reliance on traders. Over time, the Anand model came to comprise a three-tiered structure of village dairy societies, district unions, and a state milk marketing cooperative federation; a national federation was later created. Each cooperative member had one vote in society decisions; all producers (from those with one cow or buffalo to those with 5 or 6) were at least formally equal.

The cooperative approach allowed rural producers to capture a greater share of the profits from milk sales;²⁸ this was the primary incentive for producers to join. Additionally, the cooperatives sought to provide a consistent outlet for surplus milk at stable prices, both during the dry season—when supply is low and prices high—and during the flush season—when supply is ample and prices lower—by processing excess milk into products such as powdered milk and curds (yogurt). In return for this consistent buyer, however, producers had to subject their milk to regular testing. Cooperative payments for milk were and are based on fat content; milk is tested each and every time a producer supplies milk. Private milk traders did not test the milk they collected, and thus producers (and traders) had greater opportunity to water milk.

Anand became the model for Operations Flood I and II, III, (1970-1996), in which Anand Milk Union Limited (Amul), the government of India, the World Bank, and international donors sought to replicate the Anand model across India. The National Dairy Development Board (NDDB) and the Indian Dairy Corporation (IDC) were created to shepherd this expansion; the IDC has been merged into NDDB. Each Operation Flood phase targeted a set of states; a subset of districts then was selected for dairy development. Andhra Pradesh was included in all phases of Operation Flood, and Orissa entered the programme in phase II (1981).

²⁶ There were several TV and news stories on this issue in June and early July 2003. It appears that medical practitioners were slow to intervene—there were several fatalities—and do not track disease outbreaks.

²⁷ There is substantial disagreement over the key factors driving Anand and the Operation Floods that followed. See the following references (Alderman, Mergos, and Slade 1987; Candler and Kumar 1998; Doornbos et al. 1990).

²⁸ All milk does not enter the market; a substantial proportion of milk is consumed within the household where it was produced.

The Operation Flood (OF) expansion effort differed from the Anand experience in two ways that help to account for the generally inferior performance of the resulting cooperatives.²⁹ First, the new cooperatives developed in a highly protected market and received substantial subsidies. The formal dairy sector was reserved for cooperatives until 1991. New private sector actors (foreign and domestic) were required to obtain licenses to enter the sector; few were granted.³⁰ All dairy food aid was canalized through the Indian Dairy Corporation,³¹ and revenues from sales were directed to the cooperative infrastructure. Societies, unions, and federations in Operation Flood areas received substantial financial, technical, and material assistance.³² Substantial resources were invested in creating a system that was safe and hygienic. Unlike the Anand cooperative, therefore, OF dairy cooperatives did not face open competition nor hard profit incentives from the outset.³³

Secondly, the Operation Flood cooperatives were subject to extensive government involvement. From the beginning, Operation Flood leaders opted for a top-down approach to replication. In the absence of sufficient Anand-like societies in the targeted areas, national leaders resorted to working through state governments, wrongly anticipating that these governments would withdraw after the infrastructure was established. State governments were heavily involved in creation, development, and management of the cooperative infrastructure. Government involvement may have been necessary at the beginning, but most observers argue that continued political involvement in cooperative management has impeded their functioning. In Andhra Pradesh and Orissa, as in most other states, state officials appoint the managing director of the state federation; informants indicated that district and village cooperative posts were sometimes appointed or politicized as well. This practice creates problems of skill—the appointed managing director is often a member of the Indian Administrative Service, a generalist without experience in running a dairy business—and accountability—the managing director is accountable to the state rather than the dairy farmers. In effect, cooperative positions have become a vehicle for political patronage. As a consequence, some village societies are inactive and many district unions and state federations operate at a loss. One report estimated that 70 percent of district milk unions were operating at a loss in 1998 (Government of India. Planning Commission 2002). In the past 5 years, Orissa dairy cooperatives have sometimes resorted to milk holidays; the current state federation managing director, Mr. Hrushikesh Panda has prohibited the practice.³⁴ Milk holidays directly affect producers' income and provide a strong indicator of poor performance.³⁵ These problems make dairy farming less profitable for producers, but have little impact on government-appointed directors. In the past, cooperatives have secured state subsidy to cover their losses.

These failings help explain why the formal sector continues to comprise only a small share of the total milk market. Researchers estimate that 88 percent of marketed milk is sold on the informal market, often through traders (Sharma and Sharma 2002). Cooperatives comprise the overwhelming majority of milk marketed in the formal

²⁹ Of course, there is wide variation in performance. Some Operation Flood societies have performed reasonably well.

³⁰ There are some private dairy companies (e.g. Nestle) that have long had a presence in India.

³¹ Dairy food aid is highly controversial. Canalizing food aid avoided price shocks due to dumping, but it may have allowed a greater amount of foreign dairy products to enter India. (Doornbos et al. 1990).

³² Since the end of Operation Flood III in 1996, the Government of India and the European Union have continued to provide financial assistance to dairy cooperatives through NDDDB, but the magnitude of assistance is smaller.

³³ The original Kaira district cooperative eventually was able to obtain some support and preferential treatment from the Government of Bombay (Alderman, Mergos, and Slade 1987).

³⁴ A milk holiday is a day on which cooperatives will not collect milk.

³⁵ Well-run cooperatives should have sufficient capacity to chill and process all the fresh milk they receive. This milk may be marketed fresh or made into a variety of milk products. AMUL products include ice cream, pizza, and processed cheese; Amul has 27 percent of the Indian ice cream market (Sharma and Sharma 2002).

sector; in 1995, the private sector accounted for only 13 percent of total fluid milk volume. The formal sector procures roughly 19 percent of total milk in Andhra Pradesh (Government of Andhra Pradesh). The Orissa State Cooperative Milk Producers' Federation (OMFED) has a strong presence in 14 of the 31 districts (Pradhan, Ahuja, and Venkatramaiah 2003).³⁶ In those areas, it procures 15-17 percent of total milk. Most other districts rely on collection by the Fisheries and Animal Husbandry Department;³⁷ OMFED is seeking to increase its presence throughout the state. In total, Orissa's formal sector accounts for less than 10 percent of total milk or 20 percent of marketed milk.³⁸ Cooperative dominance over the formal dairy market is thus less impressive than it seems.

The dairy sector is highly organized at the national, state, and local level. At the national level, the National Dairy Development Board (NDDB) and the Gujarat Cooperative Milk Marketing Federation (GCMMF) are most influential.³⁹ NDDB, led by Dr. Amrita Patel, has substantial assets, expertise, and connections to national policymakers as well as dairy cooperatives. GCMMF's influence stems from its position as originator of the Anand model, its continued success, and the involvement of Dr. Kurien,⁴⁰ a leader in the cooperative movement. Both organizations are linked to government, but they have substantial autonomy. The state dairy federations and district unions are closely tied to government, as described above, and enjoy much less independence. It cannot be assumed that most dairy cooperatives represent the interests of their members.

State service provision: Animal health and breeding

For most of the post-Independence period, provision of veterinary and breeding services was seen as a state responsibility. Andhra Pradesh and Orissa invested considerable resources in developing the human and material infrastructure to provide free veterinary and breeding services. Veterinary services were provided through a system of veterinary hospitals, clinics, and centres staffed by veterinarians and paraveterinarians.⁴¹ Andhra Pradesh had 285 veterinary hospitals, 1,808 dispensaries, and 2,889 centres in March 1999; Orissa had 13 hospitals, 527 dispensaries, and 2,937 centres (Government of India. Ministry of Agriculture. Department of Animal Husbandry & Dairying 2003). Animal health services and medicines provided during operating hours were supposed to be free.

Recent research has shown that this system of nominally free services is quite costly to producers (Ahuja et al. 2000; Ahuja, Morrenhof, and Sen 2002). Producers pay government practitioners for animal care, absorb considerable transportation costs, and must purchase medicines as free supplies are inadequate or on sale. Additionally, while the reach of government services is considerable, many producers may be too

³⁶ 17 districts are now incorporated into the OMFED structure. Of functional societies in these districts, about 87 percent reported a profit in April 2003 (personal communication with OMFED).

³⁷ Two Orissa districts that were not selected for Operation Flood—Ganjam and Gajapati—have received substantial assistance from the bilateral Indo-Swiss Natural Resource Management Program. The milk union is affiliated with OMFED.

³⁸ Pradhan, Ahuja, and Venkatramaiah (2003) state that the formal sector accounts for less than 10 percent of total milk in Orissa; half the milk is consumed by producer households.

³⁹ Other dairy sector organizations include the National Cooperative Dairy Federation and the Indian Dairy Association, which the IDA includes private companies.

⁴⁰ Dr. Kurien worked at the Anand cooperatives and led NDDB throughout Operation Floods I & II. He has retired from leadership of NDDB.

⁴¹ Paraveterinarians in state employ usually have received substantial training—1 year in Orissa—and some form of certification; the names for these paraveterinarians vary from state to state. Most other paraveterinarians—such as community animal health workers and Ghopal Mitras—have less training.

far from providers to have access to state-subsidized care.⁴² Orissa's animal health infrastructure is heavily concentrated in the relatively wealthy coastal districts (Ahuja, Morrenhof, and Sen 2002). Although there is roughly one veterinary centre per 45 square kilometres, the area covered by each centre ranged from 16 square kilometres in one coastal district to 125 square kilometres in 2 interior districts. Similar regional disparities may be evident in other states.

The central and state governments also developed a network of animal breeding facilities, including livestock breeding farms, frozen semen stations, liquid nitrogen plants, and semen banks. For example, Andhra Pradesh had 3,799 stationary artificial insemination centres, 4 frozen semen stations, 9 liquid nitrogen plants, 3 liquid nitrogen tankers, and 3 breeding farms for bulls (Andhra Pradesh Livestock Development Agency). These facilities were meant to provide the materials for genetic upgrading of local animals through frozen semen or bulls. Genetic material for desired breeds was also purchased from other states and abroad.

The effort to upgrade Indian livestock arises from the perceived low productivity of existing stock. The milk yield of Indian bovines is extremely low by international standards. The livestock population in Andhra Pradesh and Orissa, as in much of the country, is mostly comprised of "nondescript"⁴³ animals that do not belong to a recognized breed, that produce a relatively small quantity of milk. On average, Indian cows yield 877 kilograms of milk per year while the world average is 2,026 (Sharma and Sharma 2002). Exotic or cross-bred animals are believed to have higher production potential. At present, the milk yield from crossbred cows exceeds that from local cows in each state. However, most improvement efforts have met with little success. The evidence shows that the proportion of crossbred cattle, buffalo, and sheep remains very low despite four decades of breeding initiatives. Although the recent population growth of crossbred milch cattle has outpaced that of desi milch cattle, crossbreeds comprise just more than 10 percent of milch cattle and about 6 percent of all milch bovines in India (based on Ahuja et al 2000: Annexure Table 2.3); government crossbreeding efforts began in 1962 (GOI-NLP 1996).

Three factors provide a sufficient explanation for the failure of these efforts. First, breed improvement interventions have suffered from serious supply and quality problems. The artificial insemination program encompasses only 15 percent of the breedable population (Ahuja et al. 2000); government and cooperative programs have not provided universal coverage. Of those covered the National Livestock Policy Steering Group (1996) estimates that less than 20 percent of artificial inseminations result in conception. The Andhra Pradesh Livestock Development Agency reports an artificial insemination conception rate of 38.5 percent; 27.9 percent of artificial inseminations produced live calves. This quantity and quality of service is unlikely to change the livestock population.

Second, the level of demand for crossbred animals is unclear. The productivity of exotic and cross bred animals is more dependent on the inputs (feed, fodder, water, health services) received than that of desi (local) stock (Doornbos and Gertsch 2000). Because most Indian producers are not providing the necessary quantity and quality of inputs (see Mittal et al. 1999), the relative performance of crossbred and desi livestock given actual inputs is a crucial issue.⁴⁴ Several informants indicated that the

⁴² Information on access to animal health services is limited. Ahuja et al's 2000 study found that more than 90 percent of surveyed households in Kerala and Gujarat indicated they had access to health services while only 63 did so in Rajasthan. More than 95 percent of respondents from 5 districts in Orissa also reported access; however, the survey did not include the districts with the lowest density of veterinary centres (Ahuja, Morrenhof, and Sen 2002).

⁴³ It is not clear whether this appellation is accurate; it is likely that many "nondescript" animals are local breeds (Ramdas).

⁴⁴ Accurate assessment of the performance of desi and crossbred animals in India would require a great deal of data, including input data, producer characteristics, morbidity and mortality rates, time to productivity,

performance of crossbred animals was often inferior. If it is the case that crossbreed's actual or perceived performance is inferior, then poor producers would have little incentive to purchase or retain "improved" animals. Demand for crossbred animals would then be low. Informants linked poor performance to the inputs provided. One informant stated that crossbred cows that failed to receive the proper diet often failed to go into oestrus. Such animals provide no benefit to poor producers and may impose a loss. For that reason, the informant argued that artificial insemination was inappropriate for people with insufficient resources to care for themselves; such people should not be asked to divert scarce resources to animals. It follows that breeding programs focused on high-input animals are likely to have a regressive impact, imposing costs on the poor and providing benefits to those with resources. Some informants argued that credit programs that required producers to purchase "improved" animals have left the poor indebted. However, breeding programs linked with interventions that increase producers' ability to provide inputs could have equitable or progressive (pro-poor) effects.

Third, as mentioned, cow slaughter politics constrain breed improvement. Some experts believe that cattle breed improvement initiatives—the major focus—are unlikely to succeed when producers cannot easily cull unproductive animals. Because breeding initiatives have been more successful in Kerala, a state with good artificial insemination coverage (Ahuja et al. 2000) and the fewest barriers to slaughter and beef consumption, they argue that the anti-slaughter policies are the problem. However, Kerala differs from Andhra Pradesh and Orissa in many other ways as well. Without further analysis, it should not be inferred that slaughter policy change would be sufficient to produce the desired changes in the livestock population. In any case, change in slaughter policy is not politically feasible.

State involvement in provision of veterinary services and breeding has created a sizeable infrastructure. The 1996 Livestock Sector Review estimated that about 22,500 veterinarians and 45,000 paraveterinarians were in state or Union Territory government employ in 1989. About 90 percent of veterinary graduates worked for the government. The structure of animal husbandry departments is much like that of other Indian government agencies. A political appointee—Minister of State Droupadi Murmu in Orissa—oversees the animal husbandry portfolio. Animal husbandry is not a high profile area and thus ambitious politicians would not seek this post. One informant indicated that animal husbandry sometimes has been used as a punishment post. Ministers are attuned to the political implications of departmental activities but often have little interest in managerial and policy details.

The top animal husbandry departmental civil servant, the Secretary, is usually an Indian Administrative Services (IAS) or State Administrative Service officer who reports to the Chief Secretary. The Administrative Services are a lasting legacy of British colonial rule. Individuals enter the Services at the beginning of their career through an extremely competitive process. Officers remain with the IAS throughout their public career, but are posted to different positions as needed. Transfers between departments and parastatal posts occur fairly frequently. IAS officers are generalists who preside over a staff overwhelmingly comprised of technically expert veterinarians and paraveterinarians. These civil servants are promoted from within the department. Appointments to the highest posts (e.g. Director, Joint Director) often occur at the end of one's career and thus tenure tends to be short—often less than 2 years and sometimes as little as two months. Most technical staff begin their careers as field veterinarians or inspectors, circulating among posts before moving, in some cases, to non-service work in the department. Promotion for veterinarians and paraveterinarians is largely dependent on seniority; paraveterinarians have very little career mobility. For both, there is often a long period in between promotions and the salary hikes that follow. However, ambitious providers may seek more desirable,

productivity level, and duration of productive period. Figures based on the population of animals in milk, such as Ahuja, Morrenhoff and Sen (2002), do not provide a means for comparing the full populations.

prestigious, and profitable posts. One would expect greater competition for posts in the wealthier coastal regions than in the remote forests. The coastal areas have a greater concentration of veterinary and paraveterinary posts. It is possible that an informal market for posts allows purchase of some positions (Wade 1985).

Government efforts to provide free animal husbandry and breeding services has benefited the veterinarians and paraveterinarians in its employ. State employ has offered reasonable salaries, security, some infrastructure, and substantial opportunity for private gain through charges for services. Oversight and accountability to producers has been quite limited. Any alteration in conditions of service that increases expectations and accountability or diminishes security would encounter resistance from those with vested interests in this system. Because IAS officers are generalists whose careers advance (or retreat) through transfers among departments, Secretaries are less likely to have bested interests in the departmental status quo. This issue is discussed further in subsequent sections.

Meat production

The animals most frequently raised for meat in Andhra Pradesh and Orissa are poultry, goats, and sheep. The state has engaged in much less sector-specific activity in the meat sector than in dairy. On occasion, the central government has funded breeding projects or animal purchase.⁴⁵ Central and state governments have passed laws regulating abattoirs,⁴⁶ but these laws appear to be poorly enforced. Meat animal producers thus operate in a mostly unstructured market environment.

State neglect has produced divergent outcomes. Small producers in Andhra Pradesh and Orissa have focused on the local markets with little involvement in the commodity chain linking the animals they rear to larger markets.⁴⁷ The level of organization by or on behalf of these producers is limited, but Andhra Pradesh appears to be much more active than Orissa. In Andhra Pradesh there are sheep and goat rearers' associations with some presence at the village, district, and state level. At least one of these associations has links to members of the state legislature, and thus some capacity to have its concerns raised. Some rearers' associations regularly engage in political protest, using direct action tactics—such as bringing their sheep to fill the offices of targeted officials—to garner attention and response. The greater level of organization may have its source in sustained rural organizing by leftist and radical activists during the last several decades, the presence of NGOs willing and able to serve as institutional hosts (Houtzager 1998, 2001), and recent direct threats to these producers' livelihoods (see following section). The existence of multiple associations in Andhra Pradesh likely reflects ideological and social divisions among activists. However, informants indicated that these associations worked together on occasion. Orissa informants made no mention of sheep or goat rearers' associations, and the facilitating factors above do not appear to be present in Orissa. NGOs that work with poor livestock producers in Orissa appear to be less oriented toward political protest and mobilization. Section IV discusses the potential for producer-based organizations further.

The intensive poultry production sector—which comprises a substantial share of the market for eggs and broiler meat—is highly organized. Producers have developed close linkages to those producing necessary inputs such as feed and vaccines. These networks of affiliated organizations (such as National Egg Coordinating Council)

⁴⁵ A sheep breeding farm was established during the Fourth Five Year Plan. Animal purchase has been funded through welfare initiatives for women, Scheduled Castes, and Scheduled Tribes.

⁴⁶ The Central Government had a project that provided financial assistance for improvement of slaughter houses and carcass utilization centres, but that project is being discontinued. Andhra Pradesh received Rs. 63 lakhs.

⁴⁷ There is some work on market linkages in Rajasthan (Agrawal 1999; Robbins 1999)

appear to be focused on market concerns, such as sharing egg price information. The Government of India and the state governments did not play a major role in the “poultry revolution,” but state interventions may influence the subsequent development of commercial poultry. Informants indicated that OPOLFED, the Orissa state poultry federation, was inactive. It seems, there is little potential for pro-poor interventions in this area with the exception of animal health services. Since mortality rates among backyard poultry are high, improvements in animal health services are likely to benefit poor producers. (See Mehta et al (2002) for further discussion of intensive poultry.)

SECTION III: RECENT REFORMS

This section begins with discussion of three broad changes in the policy environment—liberalization, forest management, and decentralization. Each shift has significant implications for the livestock sector in the near and medium-term. The discussion then turns to sector-specific reform attempts at the national and state level. These include the national livestock policy process, the Livestock Sector Policy in Orissa, and Vision 2020 in Andhra Pradesh

Liberalization & the dairy market

In 1991, the Indian government embarked upon a process of liberalization, which has involved trade policy reform, market reform, and privatization.⁴⁸ The commitment to reform has been maintained through three governments—Congress Party (1991-96), United Front (1996-1998), and National Democratic Alliance (1998-).⁴⁹ Liberalization has significant implications for the dairy industry—the only part of the livestock sector subject to substantial protection and regulation. The Government of India signed the Uruguay Round Agreement of the General Agreement on Tariffs and Trade (GATT) in April 1994 and joined the World Trade Organization (WTO). To comply with GATT and WTO, India has reduced its tariffs, removed restrictions on dairy imports, and ended the canalization of dairy imports through the National Dairy Development Board (NDDB). The Government of India has continued to monitor imports of milk, milk products, and other livestock products.⁵⁰

The Government of India's liberalization process included the opening of the formal dairy market to private (non-cooperative) actors. The dairy industry was formally delicensed in 1991. In principle, delicensing has allowed private for profit companies to enter the dairy sector in large numbers, removing the effective cooperative monopoly over the formal sector. In practice, liberalization was more limited. After formal delicensing, the Government of India issued the Milk and Milk Products Order (MMPO) in 1992. The MMPO raised barriers to entry by requiring that new entrants procure milk from new "milksheds."⁵¹ This provision shielded the cooperatives from competition for milk supply, limiting producers' alternatives. Competition for the consumer milk market clearly increased, but in many cases, the new milkshed areas were less attractive or uneconomic. Cooperatives continued to dominate the formal milk market. The milkshed concept was eliminated with the amendment of the MMPO in 2001 and 2003; private companies may now purchase milk from areas where cooperatives are present. These changes increase the potential for formal sector competition for producers' milk.

Although the registration and quality regulations in the MMPO were retained—all milk marketers are supposed to produce safe and clean milk products—enforcement appears weak. The cooperative sector has invested substantial resources in creating a hygienic system, while informal traders have generally failed to address safety issues. In the past, 'formal' and 'informal' has served as a reasonable proxy for low and high quality milk, and consumers have been able to choose the quality which they prefer, paying a premium for formal sector milk. Some informants (and Candler (1998)) argue that this system is breaking down. They allege that many private dairies have relied upon purchase of milk from traders and have failed to create hygienic milk processing

⁴⁸ The reasons for this reform are beyond the scope of this report (but see Pedersen 2000).

⁴⁹ The Bharatiya Janata Party is the largest party within this alliance.

⁵⁰ GATT and WTO also require reduction in agricultural and livestock subsidies. Indian livestock sector subsidies are not substantial—in most areas there were none—and thus little change was required. See Sharma and co-authors (2002a, 2002b, 2003) for extended discussion of dairy trade issues.

⁵¹ The MMPO also required large-scale dairy operations to register. All dairy operations are subject to product safety and hygiene regulations. These have not been lifted.

systems. These practices would enable dairies to charge less for their milk. If such practices are widespread, and consumers continue to assume that formal sector milk is clean, then cooperative producers may become less competitive.

As the state has opened the dairy sector to private actors, it has also adopted policy measures that may increase their ability to compete. As was discussed, many dairy cooperatives have been subject to substantial government control and intervention. Recent reforms in cooperative law have created space for cooperatives to restructure and increase their autonomy. These laws include the national Amendment to the Companies Act (2003), the Mutually Aided Cooperative Societies Act of Andhra Pradesh (MACs, 1995), and the Orissa Self Help Cooperatives Act (2001); there are similar laws in at least seven other states. For cooperatives registered under these new laws, government officials would have no role in decision making. Instead, societies would be solely accountable to their members. This would allow societies, unions, and federations to 'hire and fire' their management.

Although cooperative advocates have succeeded in changing some laws,⁵² the struggle to reduce government involvement continues. At present there are substantial barriers to re-registration for existing cooperatives. Some states, such as Orissa, have been slow to implement the new laws. In others, cooperatives must secure the consent of a government registrar to re-register. Registrars enjoyed substantial influence over cooperatives under the old laws; securing consent is not always possible. Additionally, dairy cooperatives frequently face disputes regarding ownership of existing infrastructure. The state-controlled federation may seek to retain or claim restitution for property secured under its aegis (usually through central government or NDDDB programs). These issues have not been fully resolved in Andhra Pradesh, but 3,033 dairy societies had registered under the MACs law as of 31 March 2003 (Cooperative Development Foundation, personal communication).

This shift in cooperative law increases the potential for well-performing, professionally managed cooperatives to develop but does not guarantee this outcome. Cooperatives that choose to re-register face increased risk of failure; state governments are unlikely to subsidize autonomous cooperatives. Many autonomous cooperatives would seek to hire people with technical expertise in dairy management and marketing; it is likely that other "autonomous" cooperatives would be captured by local elites or be consumed by local conflicts and thus would continue to perform below potential.⁵³ In cases where societies are uneconomic or poorly managed, removal of subsidy may lead to closure. It follows that a voluntaristic re-registration process may lead to creaming—the disproportionate exit of high potential cooperatives.⁵⁴ Removing state involvement is costly and possibly conflictual. Re-registration would be most attractive to cooperatives that are relatively successful and confident of their ability to compete without subsidy. Marginally successful societies and unions are more likely to remain within the state structure, and thus to lessen its sustainability.

The most influential national dairy organizations do not agree on the appropriate response to the new environment. NDDDB has acknowledged that many cooperatives are not performing well and argues that improved marketing and reduced political interference is the best approach (Patel 2003). NDDDB has developed a joint venture

⁵² The Cooperative Development Foundation of Andhra Pradesh and the National Dairy Development Board have lobbied for changes in cooperative law.

⁵³ Some observers of the dairy sector argue that the dominance of the Patidar / Patel caste played an important role in the success of the Gujarat cooperatives (Alderman Mergos and Slade 1987; also see Doornbos and Gertsch 2000). Other cooperatives may be riven by intercaste conflicts.

⁵⁴ One informant argued that the exit of successful dairy cooperatives from the state-controlled Andhra Pradesh federation has undermined the federation's financial health.

model for providing federations with marketing expertise.⁵⁵ The Matha Federation of Andhra Pradesh has become part of an NDDB joint venture. Ultimately, these joint ventures are to be converted to “producer companies”, that is member-based cooperatives operating under the Company Law. The other major player, Gujarat Cooperative Milk Marketing Federation argues that the joint venture approach is a threat to cooperatives:

The key risk in the joint venture model is that it will dismantle the existing marketing federations all over the country. If the joint venture fails, then there will be no organization or skill left in the farmers’ organizations to fall back on for the marketing function (GCMMF 2003).

The chairs of NDDB and GCMMF are pressing state federations and district unions to take sides in this debate. NDDB is seeking joint venture agreements and GCMMF is lobbying against them. Several informants expressed concern regarding the effect of this argument on cooperatives. “When elephants fight, the grass suffers.”

Cooperatives maintained their dominance over the formal sector in the first decade of liberalization, but it is not clear how well they will compete in a fully open market that includes informal traders, private companies, and cooperatives from other states.⁵⁶ Some dairy cooperatives, such as GCMMF (Gujarat) and Vishaka (of Andhra Pradesh), are clearly doing well; others seem less equipped to compete.

Grazing on common & state property: *New restrictions*

The majority of Indian livestock forage for fodder in post-harvest fields, common lands, and forests; purchased feed and dedicated fodder crops comprise only a small share of animal diets. Historically, resource use often was constrained by local institutions—formal and informal rules governing how producers, farmers, and others used the commons; these institutions appear to have declined. Even when local institutions control resource use, however, local organizations frequently lack formal ownership of the commons. Many common lands and most of the forests are owned and controlled by state or national government. The state has residual ownership over “wastelands” and village commons and has formal title to many forests. Changes in conditions, management, and access policy affect many livestock producers. Conditions of common lands and forests have been declining for several decades, and policymakers have frequently blamed small ruminants for poor conditions.⁵⁷

Since the 1980s, forest ministries in particular have sought to reduce the presence of livestock in the forests. The 1988 National Forest Policy sought to balance the needs of forest-dependent people and conservation. It recommended fodder development projects and provision of forest produce—including fodder—“through conveniently located depots at reasonable prices.” The policy also stated that the needs of tribals, scheduled castes, and other poor people were to be given consideration. However, departmental assessments of carrying capacity rather than people’s needs would

⁵⁵ An NDDB subsidiary would hold majority (51%) equity in the joint ventures, and thus could exercise control over the venture. NDDB argues this is necessary to counteract political interference by state governments.

⁵⁶ Although dairy cooperatives have not begun to compete against each other for milk procurement, they are competing for market share. Cooperatives are marketing milk outside their customary destination markets. Amul markets a wide range of products (ice cream, pizza) throughout India and internationally. Andhra Pradesh cooperatives are marketing milk in Orissa.

⁵⁷ The Hanumantha Rao Commission (1987) evaluated the impact of sheep and goats on fragile ecological zones and concluded that small ruminants did not pose an ecological threat. Many researchers argue that forest management policies, insufficient staffing, corruption, and local ingenuity are at least equally important. Historically, the forest department has found it difficult to monitor and control forest extraction (Agrawal and Ostrom 2001).

determine the area to which those living near the forest would receive access. Subsequent policies continued in this vein.

The Forest Department of Andhra Pradesh has been particularly aggressive in its efforts to reduce forest extraction. In 2001, the Department issued a notice of a draft policy that would dramatically reduce grazing in the forest. One category of forests, "interior protection forests," was to be entirely closed to grazing. Other, "open forests", were to be closed for four months each year. The policy also restricted grazing to a certain number of "cow units,"⁵⁸ granted villages adjacent to forests preference, and introduced grazing fees for the first time since 1968. Goats were to be allowed into the forest only in the company of sheep, with a maximum of 4 per group of 100 or more sheep.

The proposed policy would clearly have had adverse impacts on poor livestock producers—the department estimated that 50 percent of cattle frequent the forest and acknowledged that most goats and sheep graze on common land. The sheep and goat rearers' associations and their NGO allies quickly mobilized in response.⁵⁹ Anthra, an Indian NGO, coordinated the response to the draft policy. Started by women veterinary scientists in the 1990s, Anthra works with poor people in rural areas on livestock issues.⁶⁰ Anthra has established networks of livestock rearers, animal health workers, and traditional healers; it also works closely with other NGOs on rural issues, women, and adivasis. The proposed policy was discussed at a forum on fodder and grazing issues. The participants were livestock rearers, NGO staff, and representatives of people's organizations; senior government officials were invited but did not attend. Subsequently, sheep and goat rearers convened at a state-wide meeting, discussions were held in several districts, and a critique of the logic behind the policy—particularly the focus on goats—was issued (Fodder and Grazing Forum n.d.). Individuals also used connections with elected officials and civil servants to ensure that the issue was raised; official correspondence between the Principal Secretaries of Animal Husbandry and Forestry then ensued. This mobilization led to the withdrawal of the policy and the formation of a committee to examine the issue. Committee membership was initially comprised solely of senior government officials from each department and Dr. Sagari Ramdas (director of Anthra) as a representative of the Grazing and Fodder Forum of Andhra Pradesh; later it was revised to include representatives from the sheep and goat rearer and adivasi communities. The current Forest Department grazing policy is "to have no policy." While this incident demonstrates the ability of Andhra Pradesh livestock producers and their advocates to organize in defence of their interests, it also shows their vulnerability and relative marginality—it is unlikely the Forest Department would have issued a policy ending commercial timber extraction without prior notice and consultation with the industry. The new committee may serve as a means for producers to engage pro-actively with the Forest and Animal Husbandry departments. This issue is discussed further in Section IV.

New management strategies: Decentralization & user groups

The third broad shift in the policy environment is decentralization. Two recent constitutional amendments have provided local governments—the Panchayati Raj

⁵⁸ Anthra argues that the cow unit equivalences have little scientific validity for they do not reflect established standards regarding the relative impact of different livestock—cows, buffaloes, goats, and sheep.

⁵⁹ This discussion is based on Anthra (2002) and the author's interviews with participants and observers of this process.

⁶⁰ Anthra, an NGO based in Andhra Pradesh and Maharashtra, describes itself as "an alternative resource training and advocacy centre for bio-diversity based livestock production in the wider context of people's livelihoods" (Organizational brochure). The organization trained about 300 animal health workers between 1994 and 2002. Anthra receives support from international donors and also raises funds by charging for workshops, trainings, and consultations provided to other organizations.

institutions (PRIs)—with substantial formal authority over policy, including natural resource management. To date, the PRIs have not garnered sufficient control over financial resources in Andhra Pradesh, Orissa, or most other states to have substantial authority. If the PRIs manage to secure actual control over constitutionally allocated powers, however, these institutions will control access to common lands, water, and forests. As with the forest policies above, PRI access policies will affect livestock producers' livelihoods.

The actual impact of decentralization, should it occur, is unclear. Some believe that PRIs have the potential to increase local democracy and accountability—most positions are elected and places are reserved for traditionally underrepresented groups such as women, dalits and adivasis. Others look to the Gram Sabha—the collective of all voters—for democratic, equitable decisions. But others contend these institutions could provide a new mechanism for clientelism. Individuals appointed to posts reserved for underrepresented groups may be accountable to their appointers rather than the group they ostensibly represent. All local organizations are vulnerable to elite capture. Capture of the Panchayati Raj institutions would become more desirable if they garner control over important resources. In the absence of concerted efforts to create institutional safeguards for pro-poor PRIs, the effect of decentralization on poor livestock producers is likely to vary from place to place depending upon the social composition of the area and the degree to which producers organize on behalf of their interests.

Although full decentralization to the Panchayati Raj institutions has not yet occurred, central and state government resource management strategies have shifted towards greater local involvement. While renewing efforts to conserve the forests (as described above), Forest Department officials have sought to enlist communities in forest monitoring and protection through Joint Forest Management, now called Community Forest Management.⁶¹ This shift towards local user groups is evident in watersheds and irrigation management as well (Mosse 1997, 1998). Local participation initiatives have generally involved the creation of user groups that are granted some authority over nearby areas and given limited rights to extract resources in exchange for monitoring and enforcement of access rules. In some places, these local user groups have provided monitoring and enforcement where there was little before (Agrawal 2001). The extent of local control of user groups is unclear. Officials enjoy substantial discretion in determining which areas are suitable to community management and in approving access rules, but some user groups may have substantial authority.

Improvements in forest condition from lessened resource extraction potentially have broad benefits, and motivated user groups—or policy makers—probably could design equitable policies. However, researchers have found that many of the costs have been imposed on the poorer segments of communities—including livestock producers—while local elites have captured the benefits (eg, Ramdas n.d.).⁶² Agrawal (2001) argues, "Allocation rules, even when they are seemingly equitable, produce outcomes that are systematically biased against those who are marginal and less powerful." Restrictive livestock access rules, for example, hurt the poor disproportionately, for they are most dependent on common areas and least able to pay fines or bribes. If officials and user groups continue to restrict livestock grazing without compensation, the ability of poor producers to maintain their livestock will decline. In some cases, Forestry officials have encouraged producers to sell their goats (Rao 2001). Research on community watershed management indicates that these concerns are valid there as well (Kerr 2002).

⁶¹ See the following for extensive discussion of these initiatives (Poffenberger and McGean 1996; Khare et al. 2000; Sundar 2000).

⁶² Although less research is available on these committees, many are comprised mostly of individuals who own land next to water.

In Andhra Pradesh, Chief Minister Naidu has used the Janmabhoomi Programme and user/self-help group to circumvent the Panchayati Raj institutions (Manor 2000; Powis 2003). The PRIs in Andhra Pradesh are highly politicized and party competition for the gram panchayats is the norm.⁶³ Although Naidu's Telegu Desam Party (TDP) is dominant, other parties have been able to secure representation in the gram panchayats and thus the TDP cannot fully control PRI activities. The state government has not devolved substantial powers to the PRIs; the elected sarpanch continues to control most local government resources. As an alternative to the PRIs, Naidu has created the Janmabhoomi Programme and encouraged the creation of user groups for watershed management, forest management, irrigation and other areas. Janmabhoomi is a "people-centred participatory development process" through which villagers are supposed to express their needs through the Gram Sabha, identify solutions, and then mobilize to implement them.⁶⁴ The Janmabhoomi—community mobilization—takes place about every three months. Informants indicated that the "people-centred" Janmabhoomi is highly politicized and tightly controlled by local bureaucrats; there is little evidence that local communities are driving this process (Powis 2003). Janmabhoomi may serve as a mechanism for service and resource delivery, but it has not empowered the local PRIs. Some also contend that the many user groups in Andhra Pradesh have been politicized and serve as a vehicle for political patronage.

National livestock sector policy process

During the early 1990s, the Government of India undertook a comprehensive review of the livestock sector with the aim of developing a new policy framework; the Government of Switzerland collaborated in this project.⁶⁵ A Steering Committee was established in 1993, and consultants drafted papers on a wide range of issues; the World Bank also commissioned studies on related topics. These papers, a synthesis report, and perspective papers, were shared at two national workshops and revised in response to comments. These workshops sought to engage all the relevant stakeholders⁶⁶, but there appears to have been little organized participation by farmers or livestock producers. Of the more than eighty participants listed, only two participants were listed as farmers. The informants felt that governments, cooperatives, and service providers/NGOs were most influential. Finally, the 1996 National Livestock Policy Perspective Report proposed a new livestock policy framework. Although leaders hoped that this process would lead to a national livestock policy, little visible progress towards a national policy has been made to date.⁶⁷ The reasons for the failure of this national policy effort are unclear.

The livestock policy process succeeded in influencing state and national policy debates; the perspective presented in the Report and some of the specific

⁶³ The degree of party politicization of the PRIs in Andhra Pradesh may be exceptional (Powis 2003).

⁶⁴ Janmabhoomi was launched in 1997. The core areas are community works, primary education, primary health and family welfare, environmental conservation, and responsive government. (<http://www.aponline.gov.in/quicklinks/programmes/janmabhoomi/janmabhoomi.html>). Several Janmabhoomis have included "free" veterinary camps. Informants indicated that a substantial proportion of veterinary camp vaccines and medicines were sold.

⁶⁵ As is discussed elsewhere, the Swiss have been involved in the Indian livestock sector for more than 40 years. The Swiss Agency for International Development (SIDA), Intercooperation, and state-based bilateral agencies (Indo-Swiss projects) are the primary agents.

⁶⁶ Participants included state and national civil servants, NGO and INGO staff, consultants, researchers, dairy cooperative leaders, corporation leaders, industry association leaders and farmers (GOI-NLP). Informants indicated that environmentalists and animal rights/welfare interests were also represented.

⁶⁷ The Government of India has approved an Agriculture Policy, which makes brief mention of livestock. The chapter on animal husbandry and dairying in the 10th Five Year Plan (2002-2007) is only the policy statement. (National livestock sector policy is subject to periodic review as part of the preparation process for each five-year plan.)

recommendations have been adopted. For example, the Report argued the existing breeding infrastructure was ineffective and inefficient. It proposed the transfer of this infrastructure to state livestock development boards and service delivery to private practitioners. The National Project on Cattle and Buffalo Breeding adopts this approach.

Orissa livestock sector policy

The Orissa livestock sector policy process was modelled after the national process and involved many of the same actors.⁶⁸ The state established a steering committee in 1998, the committee undertook a broad review of the livestock sector (Kurup 2003), using consultants to synthesize available research and collect original data when necessary, findings were presented to stakeholders in a series of workshops, and recommendations were drafted. Throughout this process, staff at the Indo-Swiss Natural Resource Management Program-Orissa (ISNRMPO) worked closely with officials at the Department of Fisheries and Animal Resources Development (FARD), both line staff in the Directorate of Animal Husbandry and Veterinary Services and appointees such as the FARD Secretary and Joint Director. After the Steering Committee completed its work, responsibility for navigating the policy adoption process shifted to FARD. The department drafted a policy and took it through the internal consultative process⁶⁹ and secured Cabinet approval. After a hiatus partly due to the disastrous supercyclone of 1999, the policy was approved in October 2002, subject to occasional review by the Cabinet. The consultation process included scientists, veterinarians, NGOs, and farmers. Most Orissa informants reported some involvement in the policy process,⁷⁰ although those who take issue with the market-focused approach adopted do not feel their concerns were addressed. Observers and participants in this process credit ISNRMPO—“the only stable proponent of the policy”—and the current Secretary with securing its adoption. Neither of these actors can be relied upon to shepherd the new policy through full implementation, for the Secretary is subject to transfer, and the bilateral Indo-Swiss Programme is dependent on the continued good will of government officials for its access.⁷¹

The primary reforms adopted in the Orissa Livestock Sector Policy (OLSP) are the following: 1) the marketization⁷² of veterinary and artificial insemination, 2) capacity-building of small holders,⁷³ 3) promotion of linkages between grassroots organizations and the animal husbandry department,⁷⁴ 4) re-orientation of the directorate towards

⁶⁸ Dr. MPG Kurup served as a coordinating consultant for both processes, and the Swiss Government (Indo-Swiss Natural Resource Management Program-Orissa in this case) collaborated with state government.

⁶⁹ The draft was examined by the department, who sought expert opinion on some technical matters, circulated to other departments—approval of the Finance Department was critical—and then went to Cabinet.

⁷⁰ Most of the individuals interviewed were not livestock producers or farmers; it is not clear how well these perspectives were represented in the policy process.

⁷¹ As with other Indian bilaterals, the Indo-Swiss Programme must secure consent from the Government of India for its programme of work. If the current secretary were replaced by one hostile to their approach, ISNRMPO could lose its privileged access to state officials and civil servants. To date, ISNRMPO has focused its implementation support efforts on two areas: development of departmental human resources and institutions and creation of linkages between the department and grassroots organizations.

Additionally, the priorities of ISNRMPO could change. Although the Swiss government has been involved in the Indian livestock sector for more than forty years (Intercooperation 2000), it recently has shifted towards a natural resources approach in which livestock comprises one part.

⁷² Marketization is used to describe a general shift towards subjecting health services to market forces. This may include full privatization, but also encompasses more limited reforms such as user fees.

⁷³ These initiatives were intended to increase productivity and reduce reliance on state services. The policy mentions veterinary first aid, vaccination, parasite control, feed supplementing, sheltering, innovations and candling (Section 3.1(b)).

⁷⁴ “These organizations can form the organic link between the department and the small holders as well as the conduit for transfer of technologies, skill training, extension support and even inputs.” (Section 3.1(c)).

disease control, prevention and eradication, and livestock sector development. The policy states that there should be “greater autonomy, greater member control and reduced government interventions” in OMFED and its affiliates but provides no specifics on what this would entail. The state would promote intermediate technologies—such as crossbred milch animals—through credit schemes and other programs. The Policy also seeks to develop an ecologically sustainable livestock sector and identifies the bovine population as a threat (Section 3.6). Consistent with its prior orientation, the OLSP is relatively expansive on breed improvement issues but provides less detail on other subsectors and issues.

Two reforms have already been implemented. The state has implemented user charges for veterinary and breeding services; in most cases these fees are quite low. As mentioned, most producers were already paying for services, and the fees provide the department with discretionary funds. Orissa also has created a formally independent agency, the Orissa Livestock Resource Development Society (OLRDS), which will assume ownership of the breeding infrastructure. Creation of the OLRDS made Orissa eligible for financial support from the National Project for Cattle and Buffalo Breeding; user charges are also being routed to OLRDS. Operations and maintenance of the breeding farms was quite costly; shifting ownership relieves the fiscal burden on the state and may allow for closure of some facilities. As of July 2003, the state had not ceded authority over OLRDS; the transitional governing Task Force was comprised primarily of civil servants.⁷⁵

The OLSP views grassroots organizations as a potential link between the Department and small producers, and a means for capacity building and resource transfer. There are many NGOs that work directly with communities; the policy thus seeks to link NGOs to state government. Over the last decade, NGOs have taken the initiative in training community-based veterinary paraprofessionals. In most cases, the programs were designed as follows: communities selected a few individuals to become community animal health workers; NGOs provided these individuals with training, a veterinarian kit, and subsidy; and then the individuals begin working in their home village, charging fees for their service. Since the OLSP was adopted, the Indo-Swiss program has begun an initiative to link these NGOs with the Directorate of Animal Husbandry and Veterinary Services.

To fully implement the OLSP, more radical change is required. The state would have to withdraw from direct service provision in most areas, encourage community-based paraprofessional service providers, and radically increase its activity in two areas where it has had little presence before, extension and disease control. The government faces considerable obstacles to full implementation of these changes for two reasons. One, they conflict with the vested interests of most departmental employees, and two, the state lacks capacity in these new areas. As discussed, the Directorate is comprised primarily of veterinarians and paraveterinarians who receive a salary and benefits, are paid by users for their services, and face few sanctions for poor performance. “A veterinarian enters Government service at around the age of 23-25 years, with an assured tenure of some 35 years in Government service until superannuation” (GOI-NLP: Section 7.8). The changes envisioned in OLSP would require veterinarians and livestock inspectors to fully enter the market for health services (losing salary security), would increase the stature of community service providers, and would require that veterinarians face increased accountability for performance. One would expect most veterinarians to resist these changes. To date, retired veterinarians have been the most vocal critics of the new policy. Veterinarians’ ability to resist changes arises not from the constituency they serve—which might benefit from change—but from the structure of the state bureaucracy. State employees have considerable security of tenure—Orissa cannot privatize

⁷⁵ Of 11 members, 7 are state officials—including the OMFED Managing Director, 2 are affiliated with ISNRMPO, 1 represents the state Veterinary College, and 1 represents NDDB.

veterinary practice without rewriting long-established civil service rules that affect most government employees. To do so would require expending serious political capital and alienating most civil servants for limited rewards—it is unlikely that livestock producers would reward reforms with political loyalty. One observer of national reform noted that this type of civil service reform is unprecedented in India; it is unlikely that the low profile livestock sector will lead in this area.

To lessen the resistance from veterinarians, OLSP states that the changes in veterinary service will take place over a 25-year period. Current employees will be allowed to become mobile practitioners in some areas but will not lose their benefits. This strategy could provide a simpler way to transition to the desired new system, if the state managed to avoid hiring staff with the same rights. To do so, it could leave vacancies unfilled—a common practice—or establish different contracts for new employees. However, the long transition period poses substantial risks that reforms will simply grant formal recognition to the old system of state funded private practice. While line staff and field staff will probably stay with the department until retirement, it is highly unlikely that the top department officials—secretary, commissioner, etc—will remain in their positions for 25 years. If their replacements lack commitment to this reform vision, they may bring in new veterinarians under the old rules, halting the transition.

The mismatch between present departmental capacity and the skills required by the new approach may be easier to address. Currently, the training government practitioners receive emphasizes curative interventions and grants prestige to large ruminants. Staff remaining in the state's employ would be expected to work in extension and disease prevention. These are areas their training did not emphasize and for which the potential for side benefits is limited—the market price for extension is likely to be low due to its semi-public good qualities.⁷⁶ At the time this research was conducted, the incentive problem had not yet been addressed—promotions and raises were not linked to delivery of these services. Other barriers to effective service provision include the low prestige granted to serving poor, socially marginal producers, and the lack of epidemiological skills required for disease surveillance and monitoring. The state has begun to take steps to address the skill mismatch with assistance from ISNRMPO, who are supporting the Human and Institutional Development initiative. The central government will support efforts to control foot and mouth disease.

The Orissa Livestock Sector Policy explicitly seeks to help the poor. It argues that livestock can serve as “an engine for the social and economic development of the rural population” and lists “capacitat[ing] the marginalized sections ... so that they are enabled to have equal access to the opportunities offered” as a goal (Sections 2.1, 2.4). The rationale for reforms is clear. Government veterinary and breeding service provision has consumed most of the budget but has failed to provide free service, to reach most/all producers, or to accomplish breed improvement. Additionally, state services and medicines have not been targeted to the poor (Ahuja, Morrenhof, and Sen 2002).

Whether the OLSP improves the welfare of poor livestock producers as promised depends upon the manner in which it is implemented. The principal effects of the proposed reforms concern health and breeding services. As has been discussed, the present system is not particularly pro-poor. Livestock producers who reside fairly close to a veterinary clinic or hospital benefit from access to care; in some areas,

⁷⁶ In economic theory, a pure public good exhibits nonexcludability and nonrivalry (one person's use does not prevent another's). These traits create free rider problems—since those who bear the costs of provision cannot exclude others from benefit, there is little incentive to invest. For semi-public goods, exclusion is difficult and/or subtraction (crowding) effects occur. Willingness to pay for these goods depends on how the exclusion and rivalry problems are addressed, as well as on the private benefits garnered by recipients of these goods. (These factors may vary according to the disease or extension service). Obviously, the quality of services provided would also affect demand and market price.

NGO-trained paraveterinarians provide service. Some dairy producers also benefit from local cooperative societies that provide alternatives to local sale or reliance on informal traders. Both veterinary services and dairy cooperatives have a stronger presence in the relatively wealthy coastal belt as compared to the poorer inland areas and the forested areas in which most adivasis reside (Ahuja, Morrenhof, and Sen 2002). If the state were to increase provision of semi-public goods such as extension and disease control and eradication equitably, this would clearly be of benefit to small producers.

The changes that would most directly affect poor producers involve the marketization of health services. User charges have the potential to restrict access to care—if charges exceeded ability to pay—or they might increase access if charges were used to improve service, service providers became more mobile, and/or providers entered previously unserved areas. The new user charges are low compared to the prices producers were paying previously. If the charges have not led to a change in market price, then the fees would have little negative impact on poor producers. Further research into current market prices and ability to pay may be advisable.⁷⁷ Department officials indicated that fee revenue, currently held in ORLDS coffers, would be routed to service centres for improvement. Local committees would have some say in allocation of this revenue. These measures may improve service quality.

The impact of privatization would depend on the resulting distribution of service providers and the characteristics of the local market for service. State officials indicated that privatization would be implemented first in high potential districts where conditions were suitable—mostly those along the coasts—and gradually extended elsewhere; state service might continue indefinitely in places where private practice seems unsustainable. Since the department has adopted a strategy of transition through attrition, however, it is not clear whether and how service will be targeted to the poorer areas. At present, services are concentrated in the wealthier coastal areas. Many of the poor and remote places are ill served; new posts might need to be established. To target services to poorer areas, the department would need to develop appropriate incentives, for one would expect veterinarians and paraveterinarians to resist transfer to remote areas. Community animal health workers may be willing to work in these areas, but veterinary codes require that they restrict their activities to minor veterinary services. It is also unclear whether poor areas possess sufficient resources to pay workers enough to sustain themselves (Ramdas and Ghotge 2002). Intervention to extend access to services in remote areas could have substantial pro-poor effects.

A second consideration for marketization is the likely structure of markets. Advocates of this model argue that fees and privatization will make providers more accountable to the producers who use this service. However, users' ability to hold providers accountable is limited by the level of local competition and their information regarding service quality. If there are multiple providers, the market would allow providers to select the quality and cost they prefer. When producers encounter a local monopoly or oligopoly, however, they encounter the difficult decision to pay more for inferior service or to go without—risking the loss of their animals.⁷⁸ Additionally, obtaining information on service quality may be costly—poor quality artificial insemination can result in the loss of a calving season—and may be flawed.

⁷⁷ Research indicates that producers are willing to pay. Ability of producers to pay clearly varies with their wealth. To evaluate the impact of these charges, one would need answers to several questions. What are the new market prices for veterinary and breeding services? Have the user charges simply been added to veterinarian fees? Have they fully or partially displaced the informal charges? In practice, is ability to pay taken into account? Are prices restricting access to services for poorer producers? Have charges increased practitioners' accountability to livestock producers as was proposed. Orissa DAH&VS officials indicated that they have commissioned research into the impact of user fees.

⁷⁸ Leonard (2000) proposes several strategies for addressing this problem.

If marketization is implemented without attention to ability to pay, targeting, and market structure and quality, anti-poor outcomes could result. One might get well functioning, mobile, and competitive service provision in the wealthier coast while the poorest areas lose all access to professional service as the remaining veterinarians would also service the coastal areas. If the department and its partners are attentive to these issues, however, service might well improve for all producers. The concerns raised above could be mitigated through careful design and implementation of a market-based animal health services model. Given the low level of mobilization by Orissa's livestock producers, however, other actors would need to advocate on their behalf. This issue is discussed further in Section IV.

Andhra Pradesh's Vision 2020

In early 1999, the government of Andhra Pradesh released Vision 2020, a broad vision and strategy document for the next 20 years. Although several sectoral task forces and consultant groups were involved in its creation, Vision 2020 clearly draws its motive force from Chief Minister Chandrababu Naidu.⁷⁹ Vision 2020 sets the broad framework for state policy, establishing broad goals and concrete objectives, and identifying several sectors that will serve as "growth engines." These include dairy farming, poultry, and agro-industry. The poultry and agro-industries sections focus solely on further development of the commercial sector.

Although many of the initiatives outlined in Vision 2020 are similar to those in the National Livestock Policy Perspective and the OLSP, Vision 2020 departs from these policies in its emphasis on large-scale private sector involvement in the agriculture and livestock sectors. For example, Vision 2020 strongly advocates the entry of large private investors to commercial farming.⁸⁰ Vision 2020 argues that large private investment is essential to the development of these sectors and seeks to create an enabling environment for investment. Several critics have taken issue with the Vision 2020 approach (Prajateerpu: a citizen's jury/scenario workshop on food and farming futures for Andhra Pradesh, India 2001; ANTHRA; Reddy 1999); this analysis focuses more narrowly on policy proposals in the agriculture sector that would affect poor livestock producers.

Vision 2020 outlines three major initiatives to attract private investment: infrastructure improvement, facilitation of economies of scale, removal of regulatory barriers and disincentives, and targeted research and development. Infrastructure investment includes road, port, and airport construction—to connect major rural production centres to urban areas, for example—and improvements in rural power and water supply as well as provision of sector-specific facilities—such as cold storage. Improvements in rural infrastructure and market linkage are likely to benefit small livestock producers. Better roads could improve goat and sheep producers' access to urban consumers and reduce the transportation costs incurred by intermediaries, increasing the potential for profit. Increased access could diminish the already limited market for backyard poultry if sale of intensive poultry increases in rural areas, but this seems a reasonable trade off. More consistent power could lessen the costs that cooperatives and private actors incur for milk chilling and processing, and could make sanitary meat practices more feasible. Ports and airports are less likely to directly affect poor producers as they sell mostly to local and state markets.

Vision 2020 argues that the small size of agricultural holding inhibits the growth and development of the sector. It thus advocates measures to consolidate holdings and increase output, including agricultural cooperatives, contract farming, and land

⁷⁹ CM Naidu is seen as a dynamic leader and has been credited or blamed for the tenor of the state's reform efforts. Andhra Pradesh is led by the Telegu Desam Party.

⁸⁰ The emphasis on large investors stems from the investment required for infrastructure, distribution and marketing.

consolidation. Both land and livestock are distributed inequitably in Andhra Pradesh, but livestock holdings are less inequitable. Neither cooperatives nor contract farming would necessarily disadvantage small livestock producers; both should allow producers to retain their land.⁸¹ Land consolidation may negatively affect small landholders—who are usually small livestock producers as well. Registration and consolidation processes often have a regressive impact because land is re-allocated towards social elites and large landholders, who are best situated to defend their interests in the process. In its discussion of land issues, Vision 2020 makes no reference to the welfare of small holders; it thus seems unlikely that their interests would be protected in the consolidation process. It should be noted that land consolidation faces serious political opposition; it is perhaps the least likely of the initiatives discussed to be implemented.

Removal of the regulatory barriers to private sector investment in agriculture or agroindustry would affect small livestock producers to the extent that they increase competition for livestock products or for market share.⁸² These effects are most likely to be felt in the dairy sector and poultry sectors; Vision 2020 makes no proposals regarding the non-poultry meat market. Regarding dairy, Vision 2020 recommends the amendment of the Milk and Milk Products Order (since lifted) to reduce licensing requirements and suggests the disallowal of procurement from existing milk sheds. If corporations were to set up farms or develop new milk sheds, Vision 2020 argues, they would assist in the expansion of the formal dairy sector. Vision 2020 also commits the government to implementation of the Mutually Aided Co-operative Societies Act (MACs) to remedy the politicization of cooperatives.

The effect of large private entry or expansion into Andhra Pradesh's dairy sector on small dairy producers will depend on the behaviour of these private actors. Increased competition for milk in new or existing milk sheds is likely to benefit producers, who may receive a better price, at least as long as both cooperatives and privates remain in the procurement market. It is possible that private companies might not compete for milk from small producers; instead they might target only larger producers for collection⁸³ or create private farms to produce their own milk. In that case, competition for market share would increase and outcomes will depend on the ability of cooperatives to compete and the size of the consumer market. Implementation of the MACs law would make it more likely that at least some milk cooperatives would compete successfully.

The targeted research and development initiatives described in Vision 2020 have the potential to reduce the competitiveness of small livestock producers. Because these initiatives would focus on the commercial sector and strong areas, these actors would benefit from a subsidy smaller producers would not receive. Research suggests that initiatives focused on large producers frequently fail to benefit small producers. Similarly, development would focus on "historically strong" areas. For example, the dairy initiatives are to focus on coastal Andhra Pradesh, and selected parts of Rayalseema and Telengana; replication will be limited to areas with large pasture lands. For the most part, these historically strong areas are relatively wealthy; poorer areas would not be the focus of state attention.

Other sector-specific reforms outlined in Vision 2020 include the reduction of government interference in dairy cooperatives, selective privatization of animal health and breeding services, increased investment in public goods services, and a feed and fodder development program. Vision 2020 argues that the animal husbandry

⁸¹ The impact of contract farming would depend on the specifics of the contract. In Andhra Pradesh, it seems likely that contracting would focus on households with larger plots of arable land, and thus would have little direct impact on small producers (Also see Singh 2002).

⁸² The primary exception is the MMPO.

⁸³ "Small" and "large" are relative figures; a large producer might have 4 cows. Some interviewees suggested that this was the dominant private sector approach.

department should privatize those private good services while continuing⁸⁴ and augmenting provision of public goods—disease eradication, extension, programmes for weaker sections. Andhra Pradesh has already implemented user fees. It also has created an Andhra Pradesh Livestock Development Agency for breeding services and trained paraprofessionals (“Ghopal Mitras”) to provide fee-based breeding services. As in Orissa, the Livestock Development Agency is operated by government officials. No detail is provided on the public goods and feed and fodder programmes. The feasibility and implications of these types of sector-specific reforms have already been discussed with reference to Orissa.

Andhra Pradesh’s Vision 2020 differs from the Orissa Livestock Sector Policy in its lack of an explicit stated commitment to protect poor livestock producers. Thus, there is greater reason for concern that policy implementers will not consider poor producers in their decisions. Although Andhra Pradesh livestock producers (and their allies) are more organized and politically engaged than those in Orissa, small producers are most likely to mobilize around issues that have a large and direct negative effect on their livelihoods—such as grazing restrictions or land consolidation. Initial marketization measures are likely to have little visible impact; producers are already paying for health services. The broader re-orientation of agricultural policy toward large-scale private actors may significantly affect small producers, but these changes (e.g. in regulatory policy and research programs) have little direct effect and thus are unlikely to provoke a response. Even when mobilized, small producers are likely to exert less influence than pro-reform actors such as Chief Minister Naidu and private industries. Interventions that work within this path are more likely to meet with success as long as CM Naidu remains the state’s most powerful political actor.

⁸⁴ If private actors failed to market private good services in an area, the document states, government would provide services “on a cost-recovery basis.”

CONCLUSION: STRATEGIC ENTRY POINTS, ACTORS, AND ALTERNATIVES

This paper has analyzed political and economic factors affecting poor rural livestock producers in Andhra Pradesh and Orissa. Based on that analysis, this section considers several strategies for enhancing the livelihoods of poor rural livestock producers. Possible sector-wide interventions include enhancing producers' ability to act on their own behalf and improving producers' access to common resources. Strategies that focus more narrowly on animal health services, dairy, and small ruminants are also discussed. Most strategies work within the framework of the recent reforms described in Section III. These strategies are drawn from current policy debates and informants' recommendations. This section begins with discussion of broad interventions and then shifts to consider sub-sectoral initiatives for dairy and small ruminant producers.

Enhancing producers' ability to act on their own behalf

As long as small livestock producers are not an organized and active interest group, livestock and related sector policies will be driven by other actors who may have conflicting interests. Thus, building the capacity of producers to act on their own behalf is important to improving poor producers' welfare. However, prospects for livestock sector-based organizations are limited as long as livestock remains a secondary occupation or livelihood for most producers. These producers are likely to focus on protecting and enhancing their primary livelihood, mobilizing only in response to urgent threats. Producers who garner their primary livelihood from livestock are more likely to invest in livestock-focused organizations.

The continued presence of patron-client relations in many locales poses an additional barrier to organization of producers in pursuit of their interests. Poorer producers are often linked to wealthier households through obligations and favours. Influential patrons may provide agricultural jobs, loans, or assistance in emergencies in exchange for political loyalty when it is demanded. These patron-client ties can prevent poor producers from mobilizing to assert their interests individually (through policy-based voting) or collectively (in cooperatives, interest groups or social movements). Clients also are unlikely to challenge their patrons for public office or to hold them accountable for poor management of local organizations. Those clients who secure Panchayati Raj offices reserved for Scheduled Castes or Scheduled Tribes may not act in the interest of those populations. Patron-client ties can allow the privileged to control or monopolize the distribution of divisible goods—tractors, credit, extension services—and to ensure that their interests prevail when there is a conflict between their interests and those of their clients. Patron-client relations appear to be more influential in Orissa than neighbouring Andhra Pradesh.⁸⁵ Andhra Pradesh has had sustained peasant and radical movements that mobilized segments of the rural population, and contemporary observers describe rural Andhra Pradesh as highly politicized (Manor 2000; Powis 2003). In contrast, Orissa is known for its "exceedingly quiescent civil society," and the long dominance of a narrow elite (Manor 2000).

Prospects for producer organization are also influenced by the logic of collective action (Olson 1965). Participation in organizations imposes costs as well as providing benefits. Decisions to lead or participate in associations are influenced by the perceived costs/benefit ratio and prospects for success. While it should not be assumed that participation decisions depend on an individualistic, materialist calculus (Agrawal 2001; Ostrom 1990; Tarrow 1998; Verba, Schlozman, and Brady 2000), such factors influence the development of associations and movements. The costs and benefits of participation vary across individuals, locales, and states. For example, the

⁸⁵ This assessment is based on discussions with informants and the secondary literature.

calculus of those dependent on livestock income would differ from those for whom livestock income is supplementary. Also, in places where livestock clients who join an association may lose their patron this cost would vary with the benefits provided by that patron. This cost would be insignificant in places where patron-client relations are weak or absent.

Given this context, three strategies have reasonable prospects for long-term success. One, external actors can support member-based dairy cooperatives and other producer associations such as sheep and goat rearers associations when and where they emerge, and can support poor producers involved in mixed organizations. In places where local producers have taken steps to organize, external actors can facilitate information sharing and organizational development across locales, thereby reducing the cost of organization. This strategy seems broadly relevant in Andhra Pradesh, where there are several networks of livestock producer and health service providers. In Orissa, member organizations seem most common in the dairy sector.

Two, actors can support or seek to catalyze the development of broad-based organizations in which small producers comprise a substantial share of membership. Small livestock producers often share other interests (e.g. as small farmers or agricultural labourers) and identities (e.g. as adivasis or dalits) that may be of higher priority.⁸⁶ Broad-based organizations can provide a space in which livestock producers develop the skills to advocate on their own behalf and the base through which producers articulate their sectoral interests.⁸⁷

Three, actors can monitor and support local organizations that exert control over important resources. As discussed, the Panchayati Raj institutions (PRIs) and user groups have the potential to be inclusive and democratic despite evident failures. Critical attention to local organizations increases the likelihood that poor producers will be able to participate effectively if they choose to do so. Because the influence of patron-client relations, the strength of PRIs and user groups, and the role of small producers within local organizations vary substantially from place to place, efforts to enhance producers' capacities are likely to produce uneven outcomes.

Enhancing producers' capacity and self-organization is an intensive and long-term effort. Time is required to develop local knowledge and trust, and skills and relationships. The resultant organizations, whether livestock-specific or broad-based, are likely to become politicized—to develop controversial positions and to form alliances with political leaders and parties. Direct interventions in this area are best undertaken by domestically-based organizations that are committed to long-term involvement with the targeted constituency. Nondomestic organizations usually cannot commit sufficient time and are vulnerable to expulsion if their work is perceived to conflict with state and national interests (Bratton 1989). However, international organizations can route support to domestic organizations engaged in this work.

Improving access to shared resources

The potential of livestock-based interventions is sharply constrained by the environment within which producers work. As long as poor producers lack sufficient arable land, they will depend on common and open access resources—village pastures, nearby forests, community waterholes—and therefore are affected by declines in resource conditions and vulnerable to restrictions on access.⁸⁸ Land redistribution is

⁸⁶ For example, some adivasis view the grazing and joint/community forest management conflicts as part of a broader struggle for preservation of their livelihoods that is taking place in multiple arenas—the courts, the bureaucracies, the forest.

⁸⁷ Social movement research shows that civic skills and existing networks provide important resources for issue-specific advocacy (Brady, Verba, and Schlozman 1995).

⁸⁸ Purchase of inputs such as fodder would require expenditure of scarce resources

not a feasible near-term option, but any measures that improve the condition of common resources have the potential to enhance producers' livelihoods.

There are a number of central and state government, NGO, and donor initiatives underway to improve conditions on common lands, in forests, and in watersheds. Pro-poor producer interventions in this arena might involve raising awareness of producers' needs and advocating on their behalf. Because most government initiatives are led by departments other than animal husbandry, livestock producers' interests are unlikely to be high priority. The Andhra Pradesh Forestry Committee represents an important exception. The representation of livestock producers on this committee, along with Forestry and Animal Husbandry officials, provides a venue through which producers can advocate livestock-friendly policies. In other cases, NGOs are well situated to develop interventions that incorporate producers' concerns,⁸⁹ and donors can encourage governments to adopt these approaches.⁹⁰ Animal Husbandry officials can seek inclusion in initiatives that affect livestock producers. Advocacy and producer organizations may be able to resist imminent threats—such as forest closure—but they generally lack capacity to continually monitor and proactively engage with these contextual issues. The large number of initiatives, their dispersion across government departments, donors, and NGOs, and the lack of coordination among initiatives, poses a challenge to information collection and monitoring. In the absence of greater coordination, donors can support monitoring efforts by sharing information and providing resources for monitoring.

Encouraging & enabling pro-poor animal health sector reforms

There are major livestock sector reforms underway in Andhra Pradesh and Orissa, including marketization of the animal health services. Some sector participants believe that the marketization of health services is inherently anti-poor; provision should be the responsibility of the state, not the private sector. Whether these views are valid or not, it seems highly unlikely that their proponents have sufficient political leverage to prevent marketization. Marketization fits within a liberal framework that enjoys support from leading political actors at the state (Andhra Pradesh), national (BJP), and international levels (international financial institutions and donors) (Pedersen, 2000). There has not been broad popular mobilization against marketization, most likely because changes to date have had little impact on the ground. Because producers were already paying for health services, the imposition of fees has not led to dramatic changes. If more substantial changes—full privatization of health services—are implemented, their impact is likely to be felt only after the changes are close to irreversible. Without mass unrest or a change of views among key actors, resistance is unlikely to succeed.

If one accepts that some form of marketization will be implemented, then the focus turns to ensuring that reforms are implemented in a neutral or pro-poor fashion. Realizing this potential requires that the departments of animal husbandry develop new capacities and commitments—provision of preventative care, supervision of private practitioners, monitoring of private markets, targeting of resources towards the poor—in a resource-constrained environment. There is some evidence of commitment to pro-poor reform within the animal husbandry bureaucracy of Orissa, but it exists only in pockets among high-level appointees and civil servants with strong ties to NGOs. Lower level civil servants are more likely to be concerned with retaining job security in the face of privatization. Thus, pro-poor implementation requires building departmental capacity and developing incentives for pro-poor behaviour.

⁸⁹ For example, Society for the Promotion of Wastelands Development-Andhra Pradesh tank restoration programs have encouraged villages to plant fodder trees near the bore wells.

⁹⁰ Many of the government initiatives receive significant support—technical assistance, grants, and loans—from international donor organization.

The incentive problem arises from the shift in health service provision towards semi-public goods such as prevention and extension. These services are likely to provide fewer private benefits to service providers than curative services,⁹¹ and thus providers have an incentive to focus on curative interventions. This incentive problem is not insoluble—linking observable prevention efforts to promotions or bonuses is one option—but it needs attention. Efforts to address this issue would work with the self-interest of service providers, and thus may garner support from veterinarians and paraveterinarians.

Marketization is a key component of the health service reforms planned for Andhra Pradesh and Orissa. In this context, efforts to target resources towards poor producers should engage with geographic access to services. At present, government-subsidized services are distributed unevenly, and some areas have much less access than others. Because the ill-served areas are unattractive in terms of local wealth, transport, and amenities, privatization of practice is unlikely to attract professional practitioners to these areas.⁹² Intervention in the form of subsidy (of private practice in poor areas) or targeting (of government practice) may be necessary. One approach would be to direct the resources freed by reducing government subsidy of breeding (through the Livestock Development Agencies) and animal health services (through reduced hiring) toward access in underserved areas; this would require strong advocacy and departmental leadership. One could assign a substantial share of remaining government veterinarians to these areas—providing continued job security in exchange—and/or provide a bonus to government or private veterinarians and paraprofessionals who work in these areas. While government animal health practitioners may resist placement in underserved areas, it is not clear that these practitioners possess sufficient political strength to resist this change given clear commitment by departmental and political leadership. Bilateral organizations and well-connected domestic pro-poor organizations should focus initial advocacy in this area.

The interventions discussed above vary in the extent to which they are likely to encounter resistance. Capacity building efforts would provide departments with new resources; these efforts may be welcomed. Addressing the public goods incentive problem may not be a priority for government officials, but it is unlikely to pose a threat. Efforts to influence marketization and accountability, on the other hand, may encounter resistance. Influencing the reform process requires access to the bureaucracy. Engaging with the incentive problems is probably least demanding; well-developed ideas may be adopted by departments if they do not require substantial change. Capacity building and implementation efforts also need continued involvement—a presence on the ground. Those with access can provide state departments with resources to build civil servants' skills in new areas, educate new appointees⁹³ on reform issues and advocate pro-poor strategies, and conduct research on unanswered reform questions. Departmental insiders and allied professionals, donors, and friendly or apolitical NGOs are likely to possess sufficient access to departmental staff and leadership. Of these, bilateral organizations are most likely to have resources, an explicit commitment to the poor, and a presence on the ground, but it is not clear whether these organizations will remain involved for the long-term. Other international organizations are likely to lack sufficient local presence. Departmental leaders may have access but their involvement is unlikely to be long-

⁹¹ As was discussed previously, service recipients' willingness to pay depends on the individual (private) benefits they receive. Semi-public goods provide collective and private goods, but recipients will consider only the private goods. Curative services provide mostly private goods. As a result, the market price for cures is likely to be higher than that for prevention.

⁹² It is assumed that all practitioners will charge for their services. However, service is likely to be less remunerative in very poor and remote areas.

⁹³ Appointments to the ministry and secretariat are driven by other considerations and this is unlikely to change. Appointees are subject to frequent extradepartmental transfers

term; ministers and secretaries are subject to frequent transfer. Other insiders, allied professionals and friendly organizations are less likely to prioritize the interests of poor producers, especially when these would impose costs on animal health professionals. Where they exist, however, domestic organizations that possess both friendly relations with the state department and a commitment to the poor are well-suited to encourage pro-poor reform. Activist organizations—those that take public stances critical of the department—are likely to be excluded from the reform process, and thus limited to seeking leverage from outside. Still, these organizations could be effective in putting poor producers' issues on the reform agenda. Orissa informants indicated that the department is relatively open, and some individuals and organizations have influenced reform in a pro-poor direction; this dynamic was less evident in Andhra Pradesh.

Dairy sector: Reducing intervention and increasing competition

To date, dairy sector interventions have focused on productivity (breed improvement) and cooperative marketing and processing. Cross-breeding improvement efforts have met with little success. Culling restrictions and low inputs of feed and fodder by poor producers pose daunting barriers.

Past cooperative development efforts have created a useful infrastructure that performs well below its potential; poor producers who own dairy cows or buffalo garner some benefit from cooperative milk marketing. Interventions that continue to focus on marketing and processing may benefit poor producers. Two reforms have particular potential. One, actors can pressure state governments to reduce their interference in the cooperatives so that members can hold these organizations accountable for their performance. Implementation of the new cooperative laws would grant cooperatives substantial autonomy from government and accountability to their membership. Member accountability does not guarantee performance, but managerial accountability to politicians inhibits performance.

Two, actors can encourage increased competition in the formal dairy sector; competition from the informal sector is already a reality. While the current situation has developed through a complex history, there is no obvious reason why cooperatives or private companies should enjoy a monopoly over milk collection, processing, and marketing. Reforms implemented to date have reduced barriers to entry, but local monopolies over formal sector milk collection seem common. It also seems to be the case that cooperatives do not compete for milk collection. Allowing multiple cooperatives to function in a collection area could increase the performance focus of all cooperatives.

Although reform would diminish opportunities for patronage, supporting these reforms is fairly uncontroversial. These initiatives are consistent with a liberal market framework. Private companies support reduced barriers to entry and the leading cooperative voices (NDDDB and GCMMF) advocate reduced intervention. Thus, actors of all sorts may be effective in this area. International organizations and domestic organizations can advocate these reforms and provide technical support to those cooperative societies that decide to become independent.

Small ruminant sector: Improving feed and fodder, researching markets & breeding

Ownership of small ruminants is concentrated among the poor, and thus this area is an important one for pro-poor interventions. The persistence and growth in goat rearing in the face of indifference and occasional hostility from policymakers provides clear evidence that these animals are profitable. Informants indicated that scarce fodder and restricted access to health services impose substantial costs. It is likely that small ruminant rearing is much less profitable than it could be. Interventions that focus on

feed and fodder issues could have pro-poor effects.⁹⁴ The central feed and fodder issue involves access to grazing lands. Small, marginal, and landless producers depend heavily on common lands and forests; loss of access would threaten many livelihoods. However, these resources are both declining in condition and increasingly subject to access restrictions. Policymakers have found it easier to exclude goats—owned by the poor—than cows. Small ruminant rearers and advocates in Andhra Pradesh have engaged in defensive struggles on this issue, but external actors—especially donors—could alter the content and tenor of common/state property debates by treating small producers, including sheep and goat rearers, as legitimate participants and insisting that donor-supported projects do not damage the welfare of poor producers.

Efforts to improve the welfare of small ruminant rearers are constrained by lack of information on important issues. Research in this area would contribute to future pro-poor interventions. Two important starting points are marketing and breeding. Marketing research could focus on the commodity chain. There is little research on the commodity chain that links rural meat producers to regional and urban markets,⁹⁵ but there will be many places in which the linkages could be improved to the benefit of producers and consumers. Breeding research could examine the status of indigenous breeds and consider the options for improvement. Because there are no restrictions on culling, there may be greater potential for genetic improvement programs to succeed.

The small ruminant policy environment in Andhra Pradesh and Orissa are quite different. In Andhra Pradesh, as mentioned, the political environment has been fairly hostile to small ruminants, and rearers and advocates have engaged defensively. However, producers in the subsector are relatively well organized. In contrast, the Orissa State Livestock Sector Policy acknowledges the importance of small animals and includes a brief section on meat animals. The policy can provide a point of entry for actors who wish to address the issues raised above. Interventions in Orissa will be constrained by the limited self-organization of small ruminant rearers.

⁹⁴ Health service issues have been discussed.

⁹⁵ A substantial share of meat is consumed locally.

REFERENCES

- Agarwal, Bina. 1994. *A Field of One's Own: Gender and Land Rights in South Asia*. Cambridge: Cambridge University Press.
- Agrawal, Arun. 1999. *Greener pastures: politics, markets, and community among a migrant pastoral people*. Durham: Duke University Press.
- . 2001. Common Property Institutions and Sustainable Governance of Resources. *World Development* 29 (10):1649-1672.
- . 2001. State formation in community spaces? Decentralization of control over forests in the Kumaon Himalaya, India. *Journal of Asian Studies* 60 (1):9-40.
- Agrawal, Arun, and Elinor Ostrom. 2001. Collective Action, Property Rights, and Decentralization in Resource Use in India and Nepal. *Politics and Society* 29 (4):485-514.
- Ahuja, Vinod, P S George, Sunil Ray, McConnell Kenneth E, M P G Kurup, Vasant Gandhi, Dina Umali-Deininger, and Cees de Haan. 2000. *Agricultural services and the poor: Case of livestock health and breeding services in India*. Ahmedabad, Washington, DC, Bern: Indian Institute of Management, World Bank, Swiss Agency for Development and Cooperation.
- Ahuja, Vinod, Jan Morrenhof, and Arindam Sen. 2002. Veterinary Services Delivery and the Poor: Case of Rural Orissa.
- Alderman, Harold, George Mergos, and Roger Slade. 1987. Cooperatives and the commercialization of milk production in India: a literature review. Washington, DC: International Food Policy Research Institute.
- Andhra Pradesh Livestock Development Agency. Path way to rural prosperity. Hyderabad: Andhra Pradesh Livestock Development Agency.
- Anthra. Vision 2020 livestock development policy: a skewed vision of food security for Indian farmers. Secunderabad (India): ANTHRA.
- Anthra. 2002. A status report of livestock and livelihood resources in Andhra Pradesh. Secunderabad (India): ANTHRA.
- Brady, Henry E, Sidney Verba, and Key Lehman Schlozman. 1995. Beyond SES: A resource model of political participation. *American Political Science Review* 89 (2):271-294.
- Bravo-Baumann, Heidi. 2000. Gender and livestock: capitalisation of experiences on livestock projects and gender. Berne: Swiss Agency for Development and Cooperation.
- Candler, Wilfred, and Nalini Kumar. 1998. India: The Dairy Revolution. The impact of dairy development in India and the World Bank's contribution. Washington, DC: The World Bank: Operation Evaluation Department.
- Delgado, Christopher L, M Rosegrant, H Steinfeld, S Ehui, and C Courbois. 1999. Livestock to 2020: The Next Food Revolution. Washington D. C.: International Food Policy Research Institute, Food and Agriculture Organization (UN), International Livestock Research Institute.
- Doornbos, Martin, and Liana Gertsch. 2000. Sustainability, technology, and corporate interest in India's modern dairy sector. In *Institutionalizing development policies and resource strategies in Eastern African and India: developing winners and losers*, edited by M. Doornbos. New York: St. Martin's Press.
- Doornbos, Martin, Frank van Dorsten, Manoshi Mitra, and Piet Ternal. 1990. *Dairy aid and development: India's Operation Flood, Indo-Dutch studies on development alternatives*. Newbury Park, CA: Sage.

- Drèze, Jean, and Amartya Sen. 1995. *India: economic development and social opportunity*. New York: Oxford University Press.
- Fodder and Grazing Forum of Andhra Pradesh. Critique of the draft grazing policy. Secunderabad (India): Anthra.
- Government of Andhra Pradesh. Strategy Paper of Agriculture & Allied Departments. Hyderabad: Government of Andhra Pradesh.
- Government of India (GOI). Ministry of Agriculture. Department of Animal Husbandry & Dairying. 2003a. Annual Report 2002-2003. New Delhi, Government of India.
- Government of India. Ministry of Agriculture. Department of Animal Husbandry & Dairying. 2003b. Domestic product from agriculture and allied activities [website]. [cited November 17 2003]. Available from <http://dahd.nic.in/tabs/table17.htm>.
- Government of India. Ministry of Agriculture. Department of Animal Husbandry & Dairying. 2003c. Share of agriculture and livestock sector in GDP [website]. [cited November 17 2003]. Available from <http://dahd.nic.in/tabs/table16.htm>.
- Government of India. Ministry of Agriculture. Department of Animal Husbandry & Dairying. 2003d. Value of export of livestock and livestock products [website]. [cited November 17 2003]. Available from <http://dahd.nic.in/tabs/table19.htm>.
- Government of India. Ministry of Agriculture. Department of Animal Husbandry & Dairying. 2003e. *Number of Veterinary Institutions Statewise* [website]. [cited November 17 2003]. Available from <http://dahd.nic.in/tabs/table24.htm>.
- Government of India. Planning Commission. 2002. Report of the Working Group on Animal Husbandry and Dairying for the Tenth Five Year Plan (2002-2007). New Delhi.
- Government of India. Steering Group- National Livestock Policy (GOI-NLP). 1996. National Livestock Policy Perspective: Report of the steering group.
- Government of Orissa. 2002. Department of Fisheries and Animal Resources Development. Orissa State Livestock Sector Policy.
- Graham, B D. 1990. *Hindu nationalism and Indian politics: the origins and development of the Bharatiya Jana Sangh*. Cambridge: Cambridge University Press.
- Gujarat Co-operative Milk Marketing Federation (GCMMF). 2003. Annual Report 2002-2003. Anand (Gujarat, India): Gujarat Co-operative Milk Marketing Federation.
- Houtzager, P. P. 1998. State and unions in the transformation of the Brazilian countryside, 1964-1979. *Latin American Research Review* 33 (2):103-142.
- . 2001. Collective action and political authority: Rural workers, church, and state in Brazil. *Theory and Society* 30 (1):1-45.
- Intercooperation. 2000. *Capitalisation of experiences in livestock production and dairying (LPD) in India*. Bern (Switzerland).
- Jaffrelot, Christophe. 1996. *Hindu nationalist movement and Indian politics*. London: Hurst and Publishers.
- Jodha, N. S. 1986. Common property resources and rural poor in dry regions of India. *Economic and Political Weekly* 21 (27):1169-1181.
- . 1991. Sustainable Agriculture in Fragile Resource Zones - Technological Imperatives. *Economic and Political Weekly* 26 (13):A15-&.
- Katticaren, Kurian. 2000. A Study on the Role of Women and Men in Livestock Development and Management in Orissa 1998-1999. Nothing New??? a process report. Secunderabad.
- Kerr, John. 2002. Watershed development, environmental services, and poverty alleviation in India. *World Development* 30 (8):1387-1400.

- Khare, Arvind, Madhu Sarin, NC Saxena, Subhabrata Palit, Seema Bathla, Farhad Vania, and M Satyanarayana. 2000. *Joint Forest Management: policy, practice, and prospects*. London: International Institute for Environment and Development.
- Kohli, Atul. 1998. Enduring another election. *Journal of Democracy* 9:7-20.
- Kurup, M P G, ed. 2003. *Livestock in Orissa: the socio-economic perspective*. Delhi: Manohar.
- Leonard, David K, ed. 2000. *Africa's Changing Markets for Health and Veterinary Services: the new institutional issues*. New York: St. Martin's Press.
- Manor, James. 2000. Small-time political fixers in India's states: "towel over armpit". *Asian Survey* 40 (5):816-835.
- Mearns, Robin. 1999. Access to land in rural India: policy issues and options. Washington, DC: World Bank.
- Meenakshi, JV, Ranjan Ray, and Souvik Gupta. 2000. Estimates of poverty for SC, ST and female-headed households. *Economic and Political Weekly*:2748-2754.
- Mehta, R, RG Nambia, SK Singh, S Subrahmanyam, and C Ravi. 2002. Livestock industrialization, trade and social-health-environment issues for the Indian poultry sector. Rome: Food and Agriculture Organization.
- Mittal, SP, AJ John, PK Harichandan, and DN Mohanty. 1999. The field survey for situation analysis 1999: livestock sector in Orissa. Bhubaneswar, Orissa, India.
- Mohanty, BB. 1996. Agricultural modernisation in rural Orissa: prosperity and destitution. *Man in India* 76 (1):81-90.
- . 1997. State and tribal relationship in rural Orissa: Prosperity and destitution. *Indian Anthropologist* 27 (1):1-17.
- Mosse, David. 1997. The Symbolic Making of a Common Property Resource: History, Ecology, and Locality in a Tank-irrigated Landscape in South India. *Development and Change* 28:467-504.
- . 1998. Making and Misconceiving Community in South Indian Tank Irrigation. Paper read at Crossing Boundaries: Conference of the International Association for Common Property, June 10-14, at Vancouver, BC.
- National Sample Survey Organisation. Department of Statistics. Government of India. 1997. Livestock and agricultural implements in household operational holdings, 1991-1992. Delhi: Government of India.
- Noronha, Ernesto. 1994. BJP: Cow as a political symbol. *Economic and Political Weekly*:1447-1448.
- Olson, Mancur. 1965. *The Logic of Collective Action: Public Goods and the Theory of Groups*. Cambridge: Harvard University Press.
- Ostrom, Elinor. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge: Cambridge University Press.
- Pai, Sudha. 1998. The Indian party system under transformation: Lok Sabha elections 1998. *Asian Survey* 39 (8):836-852.
- Patel, Amrita. 2003. Chairman's message: putting marketing in perspective. *Dairy* 15 (2):1-3.
- Pedersen, Jorgen Dige. 2000. Explaining economic liberalization in India: state and society perspectives. *World Development* 28 (2):265-282.
- Poffenberger, Mark, and Betsey McGean, eds. 1996. *Village voices, forest choices*. Delhi: Oxford University Press.
- Powis, Benjamin. 2003. Grass roots politics and 'second wave of decentralisation' in Andhra Pradesh. *Economic and Political Weekly* 38 (26):2617-2622.

- Pradhan, Pramodini, Vinod Ahuja, and P Venkatramaiah. 2003. Livestock services and the poor in Orissa: a case study: Danish Agricultural Advisory Centre.
- Prajateerpu: a citizen's jury/scenario workshop on food and farming futures for Andhra Pradesh, India. 2001. Hyderabad: Andhra Pradesh Coalition in Defence of Diversity; University of Hyderabad, Andhra Pradesh, National Biodiversity Strategy and Action Plan.
- Ramdas, Sagari R.And now it is Goats, which are the greatest enemies of the Environment. Secunderabad (India): ANTHRA.
- . Insights into animal husbandry in Rural India - Experiences of a Young Vet.
- Ramdas, Sagari R, and Nitya S Ghotge. 2002. Towards sustainable community livestock health care delivery systems: issues and option - the ANTHRA experience. Paper read at Workshop on Livestock Services and the Poor, October 28-29, at Bhubaneswar (Orissa, India).
- Ramdas, Sagari R, and S Seethalakshmi. 1999. Between the green pastures and beyond ... an analytical study of gender issues in the livestock sector Orissa. Bhubaneswar (Orissa, India): Indo-Swiss Natural Resources Management Programme-Orissa.
- Rao, G Bhaskara. 2001. Impact of joint forest management program in Andhra Pradesh: a case study of Nizampet VSS. In *Personal collection*. Hyderabad (India).
- Reddy, D Narasimha, ed. 1999. *Vision 2020: Myths and Realities*. Hyderabad: Sundarayya Vignanakendram.
- Reddy, G Ram. 1989. The political accommodation: caste, class and dominance in Andhra Pradesh. In *Dominance and state power in modern India: decline in social order*, edited by F. Frankel and M. S. Rao. Oxford: Oxford University Press.
- Robbins, Paul. 1999. Meat matters: cultural politics along the commodity chain in India. *Ecumene* 6 (4):399-423.
- Sharma, Vijay Paul, and Ashok Gulati. 2003. Trade liberalization, market reforms and competitiveness of Indian dairy sector. Washington, DC: International Food Policy Research Institute.
- Sharma, Vijay Paul, and Pritee Sharma. 2002. *Trade liberalization and Indian dairy industry*. New Delhi: Oxford & IBH Publishing Co.
- Singh, S. 2002. Contracting out solutions: Political economy of contract farming in the Indian Punjab. *World Development* 30 (9):1621-1638.
- Sundar, Nandini. 2000. Unpacking the "joint" in Joint Forest Management. *Development and Change* 31 (1):255-260.
- Tarrow, Sidney G. 1998. *Power in movement : social movements and contentious politics*. 2nd ed, *Cambridge studies in comparative politics*. Cambridge England ; New York: Cambridge University Press.
- Thakur, Ramesh. 1998. A changing of the guard in India. *Asian Survey* 38 (6):603-628.
- Verba, Sidney, Key Lehman Schlozman, and Henry E Brady. 2000. Rational Action and political activity. *Journal of Theoretical Politics* 12 (3):243-268.
- Wade, Robert. 1985. The market for public office: why the Indian state is not better at development. *World Development* 13 (4):467-497.
- World Bank. 2001. *India country assistance strategy*. Washington, DC: World Bank.