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FOOD PRICE POLICY IN NEPAL

Michael B. Wallace

HMG-USAID-GTZ-IDRC-FORD-WINROCK PROJECT
STRENGTHENING INSTITUTIONAL CAPACITY IN THE
FOOD AND AGRICULTURAL SECTOR IN NEPAL

FOREWORD

This Research Report Series is funded through the project, "Strengthening Institutional Capacity in the Food and Agricultural Sector in Nepal," a cooperative effort by the Ministry of Agriculture (MOA) of His Majesty's Government of Nepal and the Winrock International Institute for Agricultural Development. This project has been made possible by substantial financial support from the U.S. Agency for International Development (USAID) and the German Agency for Technical Cooperation (GTZ).

One of the most important activities of this project is funding for problem-oriented research by young professional staff of agricultural agencies of the MOA and related institutions. This research is carried out with the active professional assistance of the Winrock staff.

The purpose of this Research Report Series is to make the results of these research activities available to a larger audience, and to acquaint younger staff and students with advanced methods of research and statistical analysis. It is also hoped that publication of the Series will stimulate discussion among policy-makers and thereby assist in the formulation of policies which are suitable to the development of Nepal's agriculture.

The views expressed in this Research Report Series are those of the authors, and do not necessarily reflect the views of their respective parent institutions.

Sarah J. Tisch
Michael B. Wallace
Series Editors

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I. FOOD POLICY OBJECTIVES

Introduction

Food price policy in Nepal is significantly influenced by economic, geographic, climatic, and political factors. Nepal is one of the poorest countries in the world and the prospects for significant economic development are dim; regional geographic and climatic differences lead to pronounced inequalities in per capita food production; the open border with India prevents independent policy implementation; and its poverty and landlocked position severely limit trade policy options.

For Nepal, obvious food policy goals include efficient growth of food production to feed the growing population, equitable distribution of food, improved nutritional status for the population, and increased food security resulting from reduced variability in total food production. Such goals could be pursued through a combination of producer price policies designed to promote efficient use of inputs, increase output, and reduce output fluctuations, and consumer price policies designed to equitably distribute food and improve nutrition.

Among these objectives, Nepal has primarily emphasized increased production. Nearly all of the over 200 projects currently being implemented through the Ministry of Agriculture are production-oriented projects designed to increase irrigated area, cropped area, and use of improved inputs. This focus has been based on low per capita food production, particularly in the hills and mountains, and on Nepal's lack of comparative advantage in producing other goods for export. This emphasis has increased as Nepal's per capita food production has declined.

Regional equality has received attention through efforts to distribute domestic production and food aid to disadvantaged citizens. Improved nutrition has been connected with food policy in the goal of meeting the population's minimum basic needs. Food self-sufficiency has recently received attention as it has become obvious that Nepal is losing the race to feed its ever-growing population. Food security has been discussed mostly in terms of domestic procurement and distribution, not in terms of total production or trade possibilities. Thus, all of Nepal's food policy objectives have been linked with and based on the primary objective of increasing food production.

The major price policy instruments that have been used in Nepal to achieve food policy objectives include food subsidies to consumers, particularly in the Kathmandu Valley; product price interventions, mostly for rice and wheat; and input price interventions, primarily for fertilizer. Trade policies and macro price policies such as interest rate and exchange rate policies, while primarily intended to serve other purposes, have also affected the achievement of food policy objectives.

Food subsidies have been provided to consumers through government procurement and purchase of paddy and wheat in surplus areas for resale in deficit areas. Procurement has also been nominally used to support paddy and wheat producer prices. Fertilizer, once sold on a cost-plus basis, is now subsidized and sold at a uniform price throughout Nepal. Government corporations are solely responsible for foodgrain procurement and distribution, and for fertilizer import and sales.

Food Policy Context

Nepal is a roughly rectangular country about 800 km long and 175 km wide. Its population--nearly 90 percent dependent on agriculture--is now over 16 million, and growing by more than 2.6 percent each year. Per capita annual income is less than US\$200, and this meager amount is unevenly distributed: half the people earn less than \$100 per year (1). The 1984/85 national budget was about \$400 million, of which nearly one-third was foreign grants and loans, and one-fifth internal loans (2). Nepal's lack of resources and infrastructure--particularly transportation and communication--severely limits the possibilities for implementing any government policy designed to significantly improve the economic condition of its rural inhabitants.

Geographically, Nepal can be divided into the high mountains bordering China, the middle hills, the Kathmandu Valley, and the Tarai plains bordering India. Villagers in the dry, cold mountains subsist on livestock, potatoes, barley, and millet. Maize is the main food in the temperate/semi-tropical middle hills. Rice is the main foodgrain in the tropical Tarai plains, but wheat has become increasingly popular since the Green Revolution in the mid-1960s. The Kathmandu Valley, still considered to be "Nepal" by villagers in many remote areas, is the traditional center of political power--its rich soil and its inhabitants' economic power provide residents with a varied diet that includes imported fruits and vegetables as well as foodgrains.

Although the hills and mountains have more total land per person than the Tarai, there are 16 people for each cultivated hectare in the hills and mountains and fewer than four in the Tarai. Despite land reform efforts beginning in 1964 which placed limits on the amount of land a person can own, little land has been redistributed to poor farmers, and land ownership remains significantly skewed. The poorest half of the people, who own an average of barely one-tenth of a hectare per household, now cultivate less than seven percent of the land, and their position has deteriorated in the last 25 years (Tables 1 and 2, pp.7-8).

Production of major food crops increased by less than 30 percent in the past two decades, primarily as a result of increases in cropped area, as crop yields have been stagnant (3). (Average paddy yields are now 2.0-2.2 mt/ha, maize and wheat 1.2-1.5 mt/ha, millet and barley 0.9 mt/ha, and potatoes 6.2-6.4 mt/ha; these yields are among the lowest in Asia.) Wheat area has increased dramatically while paddy and maize area have remained relatively constant. Yield increases on irrigated land with improved seed have been offset by extensive cultivation on steep slopes. Yields in Kathmandu Valley are higher than in other regions, and yields in the Tarai are lower. This may reflect greater use of fertilizer in Kathmandu, and relative availability of land in the Tarai. Regionally, there is no marketed surplus in the mountains, hills, or Kathmandu Valley. The Tarai has a marketed surplus: some goes to India, and some to Kathmandu and the hills. As per capita production is highest in the Tarai, food policies have been designed to redistribute food from the Tarai to Kathmandu and the hills and mountains.

Nepal is falling behind in its attempt to feed its growing population. From 1971 to 1981, Nepal's population increased by nearly 30 percent, from 11.6 million to 15 million, an average increase of over

2.6 percent per year. During that same period, the production of major foodgrains increased by less than 12 percent, from about 3.5 million metric tons to 3.9 million metric tons, an average increase of less than 1.1 percent per year. In 1971, average foodgrain production was about 300 kg per person per year; by 1981 that had declined to about 260 kg; and in 1986 it is likely to be less than 250 kg (Table 3, p.9).

From 250 kg of gross foodgrain production per person per year, less than 180 kg is available in edible form. This is 500 grams per day, which provides less than 1650 calories and slightly more than 30 grams of protein. Vegetables (including potatoes, an important source of food in the hills and mountains) and animal products may increase these totals by 20 percent, so the totals may be 2000 calories and 36 grams of protein per person per day. Estimates of the requirements for calories and protein in Nepal vary, but they are all above these figures. Nutrition is at a low level, and is declining for most of the population.

These overall figures mask inequalities in the distribution of the food produced in Nepal. Some people are well-fed, while others suffer from extreme malnutrition. These inequalities are most obvious across districts, but there are also disparities within districts, within villages, and even within families (adult males receive preference). The combination of declining per capita food production and increasing inequality of land distribution implies that poorer groups in the population are becoming worse off than the averages imply.

More food is produced per capita in the Tarai than in the Kathmandu Valley and the hills, which are in turn better off than the mountains. In all areas, per capita food production has declined in the past 15 years, and it is below nutritional requirements by most standards in all areas except the Tarai. Of Nepal's 75 districts (55 hill/mountain, 20 Tarai), in 1985 only 15 were self-sufficient in foodgrain production, and 10 of them were in the Tarai (4). This disparity in per capita food production has been documented for at least 20 years (5).

Food Policy Objectives

Increased food availability can be achieved either by increasing food production or by increasing food imports. As Nepal's ability to earn foreign exchange is limited, increasing food imports is not a feasible alternative. Until a solid base for earning foreign exchange is established, Nepal must rely on its own production for nearly all of its food needs. Food aid supplied as grants from donor agencies is sometimes available, but the politics of food aid are variable and the bureaucratic procedures involved are slow. Even if Nepal were willing to become a perpetual recipient of food aid, this would not be an acceptable solution to hunger and malnutrition problems.

Food security--in the sense of reduced variation in availability or price--has not been an explicitly stated policy issue in Nepal. Food security objectives have been implicit in policies designed to reduce food prices in urban areas, and increase food availability in rural areas. Most Nepalese citizens still have links with the land in the form of family ownership, and can rely on these links in times of need. Thus food security has been less important in Nepal than in countries such as Bangladesh which have large landless populations.

Production objectives are influenced by low output in the hills and mountains which cover most of Nepal, by the difficulty of transporting improved inputs to these areas, and by dependence on the monsoon as a source of water. Objectives which might be achieved through trade policies are hindered by Nepal's landlocked position sandwiched between China and India. Its northern border with the Tibetan region of China is primarily defined by the Himalayan mountains--traversable by only a few mountain passes, and thus limiting overland trade. In contrast, its southern border with India is flat and open--unpatrolled paddy fields, where Nepalese and Indian citizens freely come and go. As a result, Nepal's economy is dominated by events in India, and Nepal's economic policies cannot deviate too much from those of her southern neighbor. Sometimes described as a yam between two boulders, Nepal is more like the flea on an elephant's back--no matter which way the flea turns, it will travel in the elephant's direction.

Official Food Policies

Nepal's experience with official food policy dates back at least to the establishment of the Dhan Kutani Bhikri Bibhag (Paddy Milling Sales Department) in 1946 in response to a sudden rise in the rice price (6). This department was charged with procurement and distribution of food to the army, police, and civilians in Kathmandu Valley. Paddy was procured through a levy charged per unit of land (beghati) and producers received an equivalent rebate in land taxes. While this was not an explicit price policy, its objective was clear: to provide food to favored groups of consumers at lower than open market prices.

After the overthrow of the Rana regime in 1951, the history of Nepal's public policies related to food can be traced through statements made in National Plans. The main objectives of the first four National Plans (1956-1975) were to develop infrastructural and institutional foundations. Increased production was a stated goal not limited to agriculture, though the Third Plan explicitly mentioned increased food-grain production. The Fifth Plan (1975-80) gave top priority to the agricultural sector and attempted to exploit the comparative advantages of the hills and the Tarai by concentrating on foodgrain and cash crops in the Tarai and on horticulture and livestock in the hills.

The Sixth Plan (1980-85) recognized that transportation links between the hills and the Tarai were insufficient to justify continued reliance on the Tarai as a source of foodgrains for the hills, and emphasized foodgrain production in the hills as well as in the Tarai. Food was identified as a basic need, and increased agricultural production was an explicit goal to meet that need, as well as to help balance international trade by increasing exports and providing raw materials for domestic agro-industries. The agricultural sector was expected to grow at 3.2 percent and the nonagricultural sector at 5.6 percent per year. Foodgrain production was targeted to increase by 2.8 percent per year. Actual annual growth rates were 4.7 percent in agriculture, 4.0 percent in the nonagricultural sector, and 6.2 percent in foodgrain production. These statistical successes are mostly the result of poor weather at the beginning of the plan period and good weather at the end; foodgrain production fell 15.4 percent during the Fifth Plan (1975-80), mostly as a result of poor weather at the end of the plan period (7).

The Seventh Plan (1985-90) aims to increase GDP by 4.5 percent per year. To achieve this, the agricultural sector is expected to grow at the rate of 3.5 percent and the nonagricultural sector at 5.7 percent per year. Foodgrain production is targeted to increase by 4.1 percent and cash crops by 5.2 percent per year. This plan lists foodgrain as the first basic need of the people, its first development strategy is "to accord topmost priority to the agricultural sector," and one of its policies is to make the mountain and hill regions self-sufficient in food within ten years. It states:

Food production has now reached a level where it cannot be deemed sufficient to meet the minimum nutritional needs of the people. In the hill areas food crisis is now so frequent that it has almost become an annual feature. The rising cost of food distribution has exerted increasing pressure on the budget year by year. The foodgrain savings of the Tarai region have started declining, and as an increasing amount of the decreasing savings is being dispatched to the hills, food grain export has plummeted, throwing the foreign trade off balance (8).

Although "top priority" has been given to agriculture since 1975, budget expenditures have not followed suit. Actual expenditures in agriculture (excluding irrigation) have never exceeded NRs.50 (US\$2.50) per capita per year, and these expenditures have never been more than 10 percent of the total national budget (NRs.710 million out of NRs.8.4 billion in 1984/85) (9).

The influence of donor agencies in determining Nepal's agricultural (and other) development policies should not be underestimated. In 1984/85, foreign aid (grants and loans) constituted over 32 percent (NRs.2.7 billion out of NRs.8.4 billion) of total government expenditure, and over 65 percent (NRs.465 million out of NRs.710 million) of agricultural expenditure (10).

The objectives of Nepal's food policies have almost always been stated in terms of increased production, by setting production targets. When these production targets have been met, it has not been primarily the result of successful government programs. This is partly because the institutions through which technological improvements were to be implemented are inefficient, and mostly because the ability of the government to significantly affect crop output in an agricultural system constrained by rudimentary transportation, and dependent on an uncertain monsoon, is extremely limited. The Seventh Plan states: "Agricultural sector, the source of livelihood and employment of the bulk of the population, continues to lean heavily on the whims of the weather gods."(11)

Notes to Chapter I

- (1) In 1976/77, based on a sample of 4596 families, 50 percent of the population earned less than US\$60 (NPC, 1978). A more recent calculation indicates that 40 percent of the population earns less than US\$90 (NPC, 1986).
- (2) Ministry of Finance, 1986.
- (3) Production statistics are calculated by the Department of Food and Agricultural Marketing Services (DFAMS) by multiplying yield and area estimates. DFAMS has limited manpower and budget, and has not conducted sample surveys of area and yield in each district. Tarai data are more accurate than hill data because sample surveys have been used more in the Tarai and subjective estimates more in the hills. When the Land Resources Mapping Project data (based on aerial photography) became available recently, hill area (and thus production) estimates were revised upward substantially.
- (4) Ministry of Supplies, 1986.
- (5) HMG, 1967; Rana and Joshi, 1968.
- (6) APROSC, July 1982b, p.15.
- (7) National Planning Commission, June 1985.
- (8) National Planning Commission, 1984, p.18.
- (9) Ministry of Finance, Budget in Nepal, various issues.
- (10) Ministry of Finance, 1986.
- (11) National Planning Commission, 1984, p.10. Monsoon rainfall data for the Kathmandu Valley for 1921-1975 verify this statement, as indicated by the table below:

 Kathmandu Valley Rainfall, 1921-1975 (mm)

	June	July	August	September	Jun-Sep
Minimum	80.0	179.4	180.1	30.8	636.0
Maximum	697.5	625.6	525.6	373.9	1608.6
Average	226.8	369.2	338.2	160.4	1094.5
Std Dev	102.0	100.4	89.6	65.7	188.6
Coeff Var	0.45	0.27	0.26	0.41	0.17

Source: Department of Irrigation, Hyarology, and Meteorology, 1977.

Table 1. Land (000 ha) and People (000) in Nepal

	Land	Population		Cult Land		Land/Cap		C Land/Cap	
		1971	1981	1971	1981	1971 (ha)	1981 (ha)	1971 (ha)	1981 (ha)
Mountains	4676	1139	1303	83	123	4.11	3.62	0.07	0.09
Hills	6188	5452	6397	345	890	1.13	0.97	0.06	0.14
Kathmandu	76	619	766	31	50	0.12	0.10	0.05	0.07
Tarai	3270	4346	6557	1167	1401	0.75	0.50	0.27	0.21
Nepal	14210	11556	15023	1626	2464	1.23	0.95	0.14	0.16

Source: CBS, National Sample Census of Agriculture, 1971/72, 1981/82.
As a result of land reform beginning in 1964, the 1971/72 Census may underestimate cultivated land. (Note unlikely decrease in total area from 1962 to 1971/72 in Table 2.)

Table 2. Area and Distribution of Landholdings

	Number Hholds	Area (ha)	Wet Area (ha)	Dry Area (ha)	Total Area	Percent Hholds	Percent of Area	Average Holding
1962								
Non-Agri	244021	0	0	0	0	13.7	0.0	0.00
No Land	21592	0	0	0	0	1.2	0.0	0.00
0.0-0.5 ha	851803	57465	139271	196736	196736	47.7	11.9	0.23
0.5-1.0 ha	285932	83345	118047	201391	201391	16.0	12.2	0.70
1.0-2.0 ha	180507	140573	114050	254622	254622	10.1	15.4	1.41
Over 2 ha	199760	724424	279362	1003786	1003786	11.2	60.6	5.02
Total	1783975	1005806	650730	1656536	1656536	100.0	100.0	0.93
Gini coefficient for distribution of landholdings: 0.690								
1971/72								
Non-Agri	362886	0	0	0	0	17.4	0.0	0.00
No Land	13852	0	0	0	0	0.7	0.0	0.00
0.0-0.5 ha	1056642	89576	155316	244893	244893	50.7	15.1	0.23
0.5-1.0 ha	264624	102149	95165	197313	197313	12.7	12.1	0.75
1.0-2.0 ha	190295	184212	97806	282018	282018	9.1	17.3	1.48
Over 2 ha	195763	696826	204621	901447	901447	9.4	55.5	4.60
Total	2084062	1072763	552908	1625671	1625671	100.0	100.0	0.78
Gini coefficient for distribution of landholdings: 0.685								
1981/82								
Non-Agri	391198	0	0	0	0	15.1	0.0	0.00
No Land	8224	0	0	0	0	0.3	0.0	0.00
0.0-0.5 ha	1099677	57892	104107	161999	161999	42.5	6.6	0.15
0.5-1.0 ha	355420	115716	149214	264930	264930	13.7	10.8	0.75
1.0-2.0 ha	379051	223029	267384	490413	490413	14.7	19.9	1.29
Over 2 ha	351584	1020974	525401	1546375	1546375	13.6	62.8	4.40
Total	2585154	1417611	1046106	2463717	2463717	100.0	100.0	0.95
Gini coefficient for distribution of landholdings: 0.700								

Note: "Non-Agri" includes all households having neither operational control of land nor livestock (and thus excluded from the Census of Agriculture). "No Land" includes households with livestock (and thus included in the Census of Agriculture) which do not have operational control of land. Gini coefficients calculated from more detailed data than shown. Inequality in the distribution of landholding is less pronounced within regions than nationally--Gini coefficients for the mountains, hills, Kathmandu, and Tarai are lower than the national coefficients.

Sources: CBS, National Sample Census of Agriculture, 1962, 1971/72, 1981/82; and CBS, Population Census, 1961, 1971, 1981.

Table 3. Food Availability

Year	Popu- lation (000)	Crop Paddy	Production (000 mt) Maize	Wheat	Mil- let	Bar- ley	Pota- to	TotCal (bln)	Cal PC/Dy	Grain PC/Yr (kg)	Edible Grain (kg)
Mountains											
71/72	1139	44	77	30	18	10	53	553	1330	156	129
76/77	1212	57	77	12	20	8	52	530	1197	144	115
80/81	1275	47	68	15	16	9	67	494	1062	122	98
81/82	1291	50	64	17	15	9	68	491	1042	120	96
82/83	1307	44	57	17	16	8	78	465	974	108	87
83/84	1324	46	59	20	16	8	57	464	959	112	90
84/85	1341	53	75	22	21	9	85	578	1182	134	108
Hills											
71/72	5452	361	424	65	91	10	130	2712	1363	174	137
76/77	5909	419	474	78	99	9	138	3061	1419	183	143
80/81	6301	387	424	118	85	9	159	2927	1273	162	128
81/82	6403	449	442	136	85	9	176	3191	1365	175	137
82/83	6507	413	389	157	85	9	177	3009	1267	162	127
83/84	6612	469	404	162	81	10	203	3200	1326	170	132
84/85	6719	509	506	146	92	11	211	3603	1469	188	146
Katmandu Valley											
71/72	519	87	33	29	3	0	21	405	1794	247	180
76/77	689	84	32	36	4	0	11	407	1620	226	167
80/81	751	72	30	27	3	0	7	340	1242	175	129
81/82	767	100	32	42	3	0	15	460	1642	230	168
82/83	783	78	45	38	3	0	13	441	1541	209	158
83/84	800	92	34	36	2	0	14	430	1473	206	151
84/85	818	85	36	30	2	0	13	401	1343	187	137
Tarai											
71/72	4346	1851	225	100	17	6	89	5087	3207	506	328
76/77	5339	1826	214	236	15	3	68	5374	2758	430	284
80/81	6295	1959	221	318	18	5	48	5918	2576	400	267
81/82	6560	1961	214	331	18	6	70	5959	2489	386	257
82/83	6835	1297	214	444	18	4	105	4913	1969	289	203
83/84	7122	2150	265	454	16	5	89	6895	2652	406	274
84/85	7422	2062	204	336	11	4	111	6165	2276	352	234
Nepal											
61/62	9413	2108	843	138	63	NA	NA	7726	2249	335	234
66/67	10430	2007	824	159	120	28	300	8040	2112	301	213
71/72	11556	2344	759	223	130	26	293	8757	2076	301	210
76/77	13176	2386	797	362	138	21	269	9372	1949	281	199
80/81	14634	2464	743	477	122	23	281	9679	1812	262	185
81/82	15023	2560	752	526	122	23	329	10101	1842	265	187
82/83	15422	1833	704	656	121	21	373	8827	1568	216	159
83/84	15832	2757	761	671	115	22	363	10990	1902	273	194
84/85	16253	2710	820	534	125	24	420	10747	1812	259	183
Conversion		0.6	0.9	0.9	0.9	0.9	0.9				
Cal/100 gm		354	349	352	332	340	100				

Sources: DFAMS; CBS, Population Census, 1961, 1971, 1981.

II. USE OF MAJOR PRICE POLICY INSTRUMENTS AND THEIR EFFECTS

Introduction

Nepal's stated food price policies include providing subsidized food to consumers in deficit areas, and production incentives to farmers through output support prices and subsidized input prices. Specifically, consumer subsidies have been provided for rice and wheat, producer paddy and wheat prices have been (nominally) supported, and fertilizer sales have been subsidized. Other official price policies--for irrigation facilities, improved seeds, pesticides, and credit--have played a minor role. The stated target populations for these policies have been poor people, but the actual beneficiaries have been politically important groups. The army and government officials, as well as economically influential Kathmandu Valley residents, have been the primary beneficiaries of food subsidy policies, while relatively richer farmers and traders have benefitted from fertilizer subsidies.

These policies have achieved their goals only to a limited extent. Food production has been increasing, but this has been primarily the result of increases in cropped area. Higher yields resulting from increased use of fertilizer on some irrigated fields have been offset by lower yields on rainfed lands as hill farmers bring steeper and steeper slopes under cultivation. The increased use of fertilizer has probably resulted from more farmers learning about this input than from the price subsidy provided by the government. Output price supports have not provided any incentive to increase production because they have not been (and cannot be) implemented. With a few exceptions in cases of crop failure or natural disasters, food subsidies have generally neither improved nutritional levels nor achieved income distribution objectives.

All the price policies discussed below must be viewed against the background of Nepal's relationship to the Indian economy. As mentioned earlier, the long open border and the relative sizes of the Indian and Nepalese economies mean that prices in Nepal, particularly those in the Tarai, are highly correlated with prices in India. Prices in other parts of Nepal depend on transport costs from India and on local production. In general, prices in the Tarai are lowest, followed by those in Kathmandu Valley, the hills, and the mountains. However, as a result of the unevenly distributed minimal transportation facilities linking hill and mountain villages with each other and with the Tarai, local production is often a dominant influence on prices in the hills and mountains.

Table 4 (p. 24) illustrates some of the relationships among market prices within Nepal, and between Nepalese and Indian prices. Indian and Tarai markets are closely linked, Kathmandu is moderately linked, and hill and mountain markets are somewhat independent of the others. The weaker correlation of Kathmandu, hill, and mountain prices with Indian and Tarai prices and with each other is one result of the higher transport costs involved in moving goods to, from, and among these markets.

Seasonal price variation is significant, with annual high points preceding and low points following harvests. This hurts poor farmers who must sell grain to repay loans at harvest time. Unfortunately, lack of adequate data prevents systematic analysis of this phenomenon.

Food Subsidies to Consumers--Grain Procurement and Distribution (1)

Food subsidies to consumers have been provided through a combination of government procurement and sales at below-market prices. While the explicit objective of the food subsidy policy has been to help eliminate food deficits and to stabilize market prices, its main effect has been to keep prices low for favored groups of consumers, especially Kathmandu residents and government officials in food-deficit areas.

Until the 1970s, public intervention in foodgrain markets in Nepal consisted of paddy procured through a levy in the Tarai which was sent to Kathmandu for distribution among the army, government officials, and urban residents. In 1974, the Nepal Food Corporation (NFC) was formed to procure and distribute foodgrain on a larger scale. The stated objectives of the NFC are to collect, store, transport, and sell food at low prices to eliminate food deficits in remote areas; to purchase and sell agricultural products to implement the government's food price policy; to execute government policy with respect to the institutional export of rice; and to manage warehouses for the collection and storage of foodgrain to meet domestic requirements. NFC's role thus includes providing fair prices to both producers and consumers.

Eight quasi-governmental Rice Exporting Companies (RECs) were established by HMG in 1974 and 1975 to provide production incentive prices to farmers, encourage and facilitate trade in paddy and rice, and encourage free internal trade of foodgrains to help meet the requirements of food deficit areas. RECs procured both rice from millers and paddy directly from farmers through their own buying centers and through government cooperatives, and sold rice primarily to India. Initially the RECs supplied NFC with all the rice it needed for distribution by selling 20 to 30 percent of the amount exported to NFC at a levy price of about half the market price (Table 5, p.24). After two profitable years (primarily the result of sales to southern India which took advantage of restrictions on interstate grain movements in India), RECs incurred heavy losses (when the trade restrictions were removed), and were dissolved in 1980, when the government removed the ban on private exports and rice exports were allowed under a quota scheme.

Grain procurement and distribution is now solely the responsibility of the NFC, which began to procure grains on the open market in 1977 when the REC levy on exports no longer fully supplied its needs. Initially, most grain was purchased from wholesalers or millers through sealed tenders or direct negotiation. Only about one percent of NFC grain has been purchased directly from producers, as there are no price incentives for farmers to sell grain to the NFC, and no mechanism for procurement directly from farmers. Beginning in 1983/84, NFC has procured foodgrain through a levy on mills using larger than 25 horsepower engines. For 1985/86, NFC expects to obtain a third to half of its grain from this mill levy, and the rest from open market purchases. NFC procurement has always been almost entirely from the Tarai.

NFC distributes grain through a national network of government cooperatives (sajhas), private traders, and its own field offices. The amount distributed to each district is determined at the central level by NFC and the Department of Food and Agricultural Marketing Services and must be approved by the Ministry of Agriculture. In practice,

calculations of food requirements based on crop production and population are overshadowed by political considerations. In particular, calculations of per capita annual (edible) foodgrain requirements have been based on food consumption surveys (2):

Mountains	120 kg
Hills	144 kg
Kathmandu Valley	180 kg
Tarai	165 kg

Climates and the proportions of the labor force working in agriculture in the different regions indicate that relative food needs of the people are exactly opposite of the above figures. This is one indication of the political influence of Kathmandu Valley residents (3).

NFC distribution targets were based on food balance calculations by the Department of Food and Agricultural Marketing Services (DFAMS) until 1982. These balance sheets were based on population, calorie needs, and trade surveys measuring private sector food movements in Nepal. Since 1982, other factors have been included to fix targets: previous years' food distribution, requirements estimated by the Chief District Officer, NFC field staff observations, and availability of HMC funds.

NFC's distribution targets have been set to try to meet 22 percent of calculated food deficits in the mountains and 15 percent in the hills. However, there have been wide variations for specific areas. In 1983, the calculated deficit for the Kathmandu Valley was 35706 mt, and the target for distribution there was 18000 mt, over half of the deficit. For the rest of the Central Hills, the calculated deficit was 10100 mt, and the distribution target was 2700 mt, about one-fourth of the deficit. On the other hand, the Midwest Mountains had a deficit of 33705 mt, while the distribution target there was only 1050 mt, less than three percent of the deficit (4).

From 1974 to 1985, NFC distributed over 400,000 metric tons of grain, of which 54 percent went to the Kathmandu Valley, 39 percent to the hills, and seven percent to the mountains (Table 6, p.25). This distribution satisfied 34 percent of the food deficit in the Kathmandu Valley, 19 percent in the hills, and 7 percent in the mountains, based on food balances calculated by DFAMS (5). Although the Sixth Five-Year Plan (1980-85) stipulated that NFC halt grain sales to the Kathmandu Valley by 1985, the percentage of total grain distributed there has not decreased. There are obvious financial and political reasons for concentrating distribution in Kathmandu. As a result, NFC distribution has done little to alleviate food shortage problems anywhere in Nepal, particularly outside the Kathmandu Valley (6).

Subsidized food sales are a substantial portion of total consumption in Kathmandu Valley. For example, in 1983/84, 22483 mt of foodgrain was supplied to Kathmandu. If 180 kg per capita is used as the annual foodgrain requirement, the population of Kathmandu (818,000) required 147,000 mt of foodgrain, so NFC was supplying nearly one-sixth of the requirement. Even though all this grain is distributed at below-market prices, the depressing effect on foodgrain prices in Kathmandu is probably small because supplies at the margin come from Tarai farmers and traders, not from NFC (and NFC supplies are originally from the Tarai).

NFC distribution prices are determined by the Ministry of Supplies, and vary by district. In more remote areas, prices are higher because of transportation costs. HMG partially subsidizes these transportation costs, so remote districts also have the largest actual subsidy per ton of grain distributed. (Although transport costs in the mountains are often double the cost of the grain itself, total procurement and distribution costs have always been highest in Kathmandu, which receives the most grain (7).) There was almost no change in NFC prices from 1975 to 1981, although foodgrain market prices rose considerably (Table 7, p. 26). Consequently, NFC losses for each metric ton of grain distributed rose from NRs.165 to NRs.2414 during this period. Since 1981, NFC prices have risen steadily, more than doubling in some areas, and NFC losses temporarily declined as a result (Table 8, p.26). These losses, which cumulatively total over NRs.500 million, are financed by loans from Nepal's banks at the request of HMG. In mid-1985 NFC had outstanding commercial bank loans totalling nearly NRs.200 million (8).

NFC's price policy also provides an illustration of the political power of Kathmandu Valley residents. Food distribution prices are lower here than in other areas of the country with similar marketing costs, despite residents' higher incomes and greater access to food supplies than their village counterparts. In March 1985 a price increase was approved to reduce NFC losses: while this increase is still in effect for the rest of the country, it lasted only eight days in Kathmandu.

Total actual food subsidies provided to consumers are now at least NRs.150 million (minimum NRs.1000/mt price subsidy for 50,000 mt distributed, plus NRs.100 million transport subsidy) per year (9). This subsidy would constitute over one-fifth of the annual allocation for agriculture if it were incorporated into the national budget.

Each district has a Food Management Committee to organize and regulate distribution of the grains allotted to them. In times of shortage, one member of the committee, the Chief District Officer, issues coupons entitling bearers to specified amounts of grain. A 1982 study found that 24 to 33 percent of NFC grain is sold to government officials and the military, while most of what goes to the general public is sold to influential members of society. Very little reaches the poor. Furthermore, a large portion of the grain which is purchased by wealthier people is resold to poor people at higher prices, used to produce local liquor or to pay laborers, or transported across the Tibetan border for resale (10). Scherer (1986) writes:

In Nepal, foodgrain marketing activities involving government organizations are rooted in the historic tradition of paying tribute to the center of power. Thus, government marketing operations in the country's most recent history initially commenced [in 1946] with the objective of securing foodgrain supplies from the Tarai belt for the Kathmandu Valley. Only in the beginning of the 1970's, HMG's foodgrain marketing involvements expanded to providing supplies to other districts and food deficit areas of the country as well. However, the mentality accepting that government servants and important persons have the right to claim the main share of such supplies remained. Until today, this attitude hampers in most areas the implementation of the objectives of the original governmental policy to reach the poor and needy groups of

the population in times of local food shortages. In ... the Kathmandu Valley, the tradition and habit of receiving through governmental entities foodgrains at advantageous prices has entrenched itself as a right taken for granted. Such developments are typical for situations where the government servants and policy-making groups belong to the beneficiaries and reap advantages for themselves, their families, servants or commercial enterprises. (11)

Most grain distributed by NFC has been rice, perhaps because this is Nepal's main foodgrain. Although maize and wheat have higher calorie and protein values per rupee than rice, rice is a preferred food, desired by rich as well as poor people. Thus, distributing more maize and wheat (and lower quality rice) would provide a self-targeting mechanism to insure that truly needy people received foodgrain. (12)

Large amounts of food aid have been sent to Nepal in times of natural disasters such as earthquakes or extremely unfavorable weather. However, the amounts and timing of such aid have not been consistent, as they depend on external political and economic factors. Sometimes food aid, requested in response to low production or natural disasters, has only arrived in time to depress output prices for the following crop season. Food aid, while important at times, cannot be considered a consistent source of food for Nepal (Table 6, p.25) (13).

Conceptually, NFC maintains stocks for normal operations and for disaster relief. FAO has recommended that working stocks for normal operations should be 10-15,000 mt, and that 5000 mt should be held for relief operations (14). As NFC stocks since 1981/82 have always been above 20,000 mt, the level of stocks has not been a problem.

Product Price Interventions--Output Price Supports

HMG first announced a minimum support prices for rice and wheat in 1976/77. These support prices are fixed by the Central Food Management Committee on the basis of the cost of production, the general foodgrain production situation, market prices in Indian border markets, market prices in the main producing areas, transportation costs from producing areas to border markets, and Indian support prices (15). In practice, Indian support prices have been--and must be--the most important factor; in some years Nepal has delayed announcing support prices precisely because the announcement of Indian support prices has been late. Support prices have almost never been used to procure foodgrains, and levy prices have been used to procure paddy and rice only.

The Indian Agricultural Prices Commission, established in 1955 when foodgrain prices were falling sharply, fixes the levels of three prices: minimum support prices--announced at sowing time--for major field crops, below which market prices are not allowed to fall; procurement prices--fixed at the start of the marketing season--for cereal grains to be procured by government agencies for release through the public distribution system (these are generally higher than support but lower than free market prices); and issue (subsidized) prices for grains when they are distributed to consumers (16). India now has over 30 million mt of foodgrain in storage as a result of good harvests in recent years, and the real problem is poverty, not production--poor people do not have the purchasing power to obtain this surplus grain.

Support prices have been ineffective in influencing foodgrain market prices and production for several reasons. First, NFC has not procured enough grain to have any effect on open market prices, largely because of severe budget limitations. Between 1980/81 and 1984/85, NFC procured less than 200,000 metric tons of grain, less than two percent of the total grain produced. Grain procurement has been almost entirely in the Tarai, providing no incentive to increase production in the hills and mountains, which have the greatest food deficits.

The amount of purchase necessary to affect open market prices varies with demand and supply elasticities, which are in turn influenced by buyers' and sellers' trading strategies. One FAO official suggests that a secure market is as important to sellers as a good price, and that NFC can provide psychological assurance to farmers simply by opening stores to defend the minimum price, even if only small amounts of grain are purchased.

Second, announced prices have consistently been lower than prevailing market prices. Thus, the support price has provided no incentive for farmers to produce or market more foodgrain. (Support prices for jute and sugarcane have also been consistently below market prices.) Much of the grain has been procured as a levy on traders and millers, with the rest coming from open market purchases, also generally from traders and millers. Suggestions have been made to obtain grain from farmers as a way of collecting outstanding fertilizer loans (17), but no mechanism exists to purchase grain directly from farmers.

Third, prices have usually been announced well after harvests, which is too late to affect planting decisions or encourage the use of fertilizer and improved seed varieties. HMG has pledged to announce support prices earlier in the season. Since 1984 support prices have often been announced before harvest, but never before planting.

Until HMG can consistently announce remunerative prices in a timely fashion and back them up with sufficient purchases, Nepal's foodgrain price support system will remain a policy on paper only. However, Nepal cannot have a support price policy which deviates from Indian market prices in the states bordering Nepal by more than transportation costs. If the support price in Nepal is higher than the Indian price, grain will move from India to Nepal, and if Nepal's price is lower, Nepalese farmers will sell their grain in India.

Some writers suggest that there are a few large grain millers in the Tarai who collude to control grain prices, and that a support price which is lower than the market price may enable millers to justify offering a lower price than they otherwise would (18). Given the large size of the Indian market, it is more likely that Tarai grain millers cannot avoid responding to Indian prices. Good harvests in Nepal and India often coincide, so price movements in Nepal can be accentuated by similar changes in India. (The existence of Nepalese merchants' associations which meet to fix commodity prices is not necessarily evidence of monopoly. These associations may simply be transferring market signals from India. Analyzing possible monopoly aspects of the Indian grain trade is beyond the scope of this paper.)

Input Price Interventions---Fertilizer Price Policy

In Nepal, the fertilizer price is a major food policy issue which attracts public attention whenever it is changed. Fertilizer is the most important purchased input for most farmers, requiring them either to spend precious cash or to obtain loans from time-consuming formal or expensive informal sources. Although fertilizer may represent only about ten percent of the total cost of production, it is often most or all of the cash cost. While the average farmer uses less than 50 kg of fertilizer per year, and this costs less than NRs.200 (US\$10), farmers know that the government fixes fertilizer prices, and direct their complaints accordingly when the price rises. Large farmers spend considerably more than the average, and complain more loudly. A rise or fall in the price of chemical fertilizer thus has a politically visible effect on the welfare of farmers--a large, vocal, and sometimes politically powerful group of people.

Fertilizer price policy has both efficiency and equity objectives. The efficiency objective is to increase crop production by encouraging farmers to use more fertilizer. The equity objective is to ensure that fertilizer price policy does not disadvantage poor farmers, especially those living in the hills.

Transport costs are lower for the Tarai and the Kathmandu Valley, so it is easier to increase fertilizer use in these areas than in the hills. However, the poorer half of Nepal's population lives in the hills where food deficits have become chronic, so there are equity reasons for subsidizing their fertilizer use. Transporting food to the hills is also more expensive than transporting fertilizer to grow food.

Fertilizer sales have been subsidized by the Nepalese government and by foreign donor agencies to encourage increased use by farmers and thereby increase crop production. Fertilizer sales have quadrupled in the last fifteen years, and some of the increase in crop production during that time can be attributed to fertilizer. However, the financial burden of the subsidy for both the Nepalese government and foreign donor agencies has also risen substantially along with fertilizer use.

Fertilizer use. Fertilizer use officially began in Nepal in 1965/66 when 3169 mt were received as aid from India and the U.S.S.R. (Table 9, p.27). Both foreign aid and imports have increased steadily, with aid accounting for between one-fifth and nine-tenths of the annual supply since 1975/76 (Table 10, p.27). Since 1981/82, Nepal has also received fertilizer through World Bank and Asian Development Bank loans, and in 1984/85 loans provided over half the fertilizer supply.

Fertilizer is imported and received as aid from a variety of countries, with one notable exception: no fertilizer is officially imported from India. India--both a fertilizer producer and (net) importer--has prohibited the export of this commodity since 1965/66 (19).

Annual fertilizer sales are now over 100,000 mt, increasing at more than 15 percent per year, with urea and complex each accounting for about half the total. Fertilizer is used in more than 60 of Nepal's 75 districts. Average fertilizer use, as measured by sales, is now about 18 nutrient-kg/ha, among the lowest in the world.

Based on sales, more chemical fertilizer is used on summer crops (mostly rice and maize) than on winter crops (mostly wheat) (Table 11, p.28). However, more fertilizer is used per hectare on the winter wheat crop than on summer rice and maize. This is probably because most of the wheat strains cultivated in Nepal are high-yielding fertilizer-responsive varieties which have been recently introduced, while most of the rice and maize strains are traditional varieties which have long been cultivated without chemical fertilizer. Almost all the wheat area cultivated in Nepal is planted with high-yielding varieties, but this is the case for only one-third of the rice and maize.

Much more fertilizer is sold in the Kathmandu Valley and the Tarai than in the hills and mountains (Table 12, p.28). The Kathmandu Valley contains about two percent of Nepal's cultivated area, but farmers there purchase over one-fifth of all fertilizer sold in the country. The Tarai has about half the cultivated land, and farmers there buy nearly three-fifths of all fertilizer. Hill farmers, who cultivate nearly half of Nepal's farmland, buy less than one-fifth of the fertilizer. If all fertilizer is used where it is sold, on a per-hectare basis Kathmandu farmers use over 140 nutrient-kg of fertilizer, while Tarai farmers use 16 kg, and those in the hills use less than nine kg.

While this geographical distribution of fertilizer sales may be consistent with a policy of concentrating fertilizer in areas where irrigation facilities are available and therefore productive capacity is highest, it is more likely that this distribution pattern is the result of lower transportation costs and greater farmer purchasing (and political) power in Kathmandu and the Tarai. While more research is needed on the costs and benefits of fertilizer use on hill crops, this distribution probably does not maximize the value of additional crop production.

Fertilizer use is increasing throughout Nepal. The rate of increase is most rapid in the hills (over 20 percent per year from 1975/76 to 1983/84), followed by the Tarai (over 17 percent) and the Kathmandu Valley (nearly eight percent). However, the high rates of increase in the hills are partly the result of the low base from which these rates are measured. Per hectare, the absolute increase in fertilizer use from 1975/76 to 1983/84 was highest in Kathmandu (from 70 to 142 kg), followed by the Tarai (from five to 16 kg) and the hills (from three to nine kg).

Fertilizer use and fertilizer demand may be quite different. Most of the fertilizer used in Nepal is officially imported and sold through the Agricultural Inputs Corporation (AIC), and the rest is unofficially imported from India. Farmers' demand has little direct impact on the kinds or quantities of fertilizer that are available each crop season--the availability of loans and foreign aid grants, and AIC's management capacity, are much more influential factors. Total fertilizer demand is thus probably considerably greater than sales and actual use.

Fertilizer demand is based on the expected impact of fertilizer use on crop production, and on the expected value of crop output, and thus it is directly related to farmers' expectations about the prices they will receive for their crops. Since 1971/72 fertilizer prices have generally not risen faster than crop prices, and in many periods crop prices have risen considerably more than fertilizer prices.

Fertilizer use is also related to farmers' expectations about the availability of water, which complements fertilizer and is necessary to achieve high yields from modern varieties of seed. The low use of fertilizer in Nepal is partly a reflection of the dependence on irregular monsoon rains and the lack of assured irrigation to supplement rainfall. However, given the low absolute levels of fertilizer use in Nepal, considerable production gains could probably be realized from increased fertilizer use even in the absence of more irrigation facilities.

Fertilizer prices. The price of fertilizer in Nepal is determined by the HMG Cabinet of Ministers. The AIC General Manager can propose a price change to the AIC Board of Directors, and if the Board approves, the suggestion is sent to the Ministry of Agriculture. If the Ministry approves, the proposal goes to the full Cabinet for a final decision.

Before 1972, the selling price of fertilizer was based on AIC's import costs plus internal transportation costs. While this was logical from a cost point of view, the price was higher in India (as a result of India's import policy and tax) than in the Tarai, and higher prices discouraged fertilizer use in the hills (20). In 1972, the Agricultural Marketing Conference recommended that

...the selling price of fertilizer be equalized with that of neighboring Indian states, and that the base price of fertilizer be the same in both the Tarai and Hilly areas. The savings made by the equalization program should be utilized to subsidize the transportation costs to the Hilly areas and to partially cover the storage costs of fertilizer in order to insure timely distribution. (21)

The government established a uniform national price for fertilizer in 1972, and this uniform price policy is still in effect (Table 13, p.29). This decision lowered fertilizer prices in the hills and raised them in the Tarai. Although fertilizer prices have been raised several times since 1972, primarily in response to changes in Indian prices, the AIC continues to suffer losses averaging over NRs.100 million annually (Table 14, p.30). Sales prices do not cover the costs of importing fertilizer and transporting it to sales points, even though considerable fertilizer is received as aid grants.

The subsidy provided by AIC, HMG, and donor agencies varies from year to year and from one kind of fertilizer to another. While it is difficult to determine who contributes what to the overall subsidy, it is estimated that AIC and HMG have borne about half of the cost, and foreign donor agencies--including the World Bank and the Asian Development Bank--have borne the other half (22). HMG pays AIC to transport fertilizer to the hills, but this payment--now over NRs.20 million annually--does not even begin to cover transport costs. Other aspects of the subsidy are hidden because profits on grant-supplied fertilizer are used to offset losses on purchased fertilizer. As a result of these international loan and grant arrangements, AIC has not had to resort to borrowing from commercial banks to cover its operating losses.

While world fertilizer prices have fluctuated significantly since Nepal began importing fertilizer 20 years ago, the subsidy to fertilizer buyers has generally been between 30 and 50 percent of total actual cost (Table 14, p.32). Current world nitrogenous fertilizer prices are low

and as a result total actual subsidies--at official domestic selling prices of NRs.3.99 for both urea and complex--are now about 20 percent for urea and 40 percent for complex (23). These are minimum estimates because Nepal also receives some fertilizer under tied-source arrangements at higher than world market prices.

The subsidy from the Tarai farmers' viewpoint has always been less: prices in India are now equal to NRs.3.78 per kg for urea and NRs.4.20 for complex (24). Thus, there is no effective subsidy for urea for a farmer whose alternative source is India, and only NRs.0.21 per kg subsidy for complex. Prices in India have never been more than 25 percent above Nepalese prices.

The actual subsidy on a bag of fertilizer sold in Nepal varies tremendously. Fertilizer sold in the Tarai is subsidized the least, and fertilizer sold in the hills, the most. Fertilizer which farmers buy from India and bring to Nepal on their backs or in bullock carts is not subsidized at all from Nepal's viewpoint, and fertilizer which Indians buy in Nepal is subsidized without any direct return to Nepal. The fertilizer subsidy has also often made it profitable to buy fertilizer in Nepal and smuggle it across the border for resale or use in India. Higher per-kg subsidies are provided to farmers who live in the hills where transport costs are higher, but the chief beneficiaries of the subsidy are farmers in the Kathmandu Valley who use the most fertilizer per household, and Indian traders who can profit from price differences.

Trade Policy

In the past, much of Nepal's foreign exchange earnings came from agricultural exports, particularly jute, and agricultural exports have sometimes been encouraged through a variety of direct and indirect subsidies. Nepal has officially exported as much as 165,000 mt of rice worth NRs.518 million in 1981/82, but there was a net import of foodgrain in 1982/83 when the monsoon was unfavorable (Table 15, p.30). Maize has been the second major foodgrain export. Unofficial trade is difficult to quantify, but much of the grain and fertilizer which moves both ways across the Nepal-India border is not recorded as official trade. Official trade probably accounts for less than one-fourth of all trade.

Current trade regulations include a ban on the export of all foodgrains in anticipation of a food shortage resulting from the late monsoon in 1986. There are no import taxes levied on the import of foodgrain or fertilizer, and previous taxes on foodgrain imports have been minimal. Past trade policies have included periodic bans on the export of foodgrain following production declines. While these restrictions have undoubtedly reduced the amount of grain exported to India by raising the transactions cost, some grain has been exported every year.

There are also nonprice reasons for grain movements across the border. Restrictions on interstate movement of grain in India have been circumvented by moving grain from Uttar Pradesh into central Nepal, east along Nepal's roads, and back into Bihar. Lack of adequate roads and markets in western Nepal can be overcome by moving grain from Nepal into India, along India's road and rail network, and back into central Nepal.

Nepal's most important policies affecting trade in agricultural commodities are related to the open border with India and the development of transportation links within Nepal. Despite political pressure to limit in-migration from India, Nepal also derives advantages from the open border, and restricting movement in either direction would be both politically and practically difficult. As the transportation network within Nepal is developed, the cost of carrying goods both within Nepal and to and from India will decline, and Nepalese in remote areas should benefit from increased access to markets for their labor and crops.

As "most price policies are implemented by interventions at the border--by taxing or subsidizing international trade,"(25) the open border and high transportation costs within Nepal mean that implementing any food price policy is difficult. International trade in foodgrains affects both consumers and producers in the Tarai (and sometimes Kathmandu), but government control over this trade is limited. For the mountains and hills, transportation costs for foodgrains are sufficiently high that international trade has little impact.

Macro Price Policy--Interest Rates and Exchange Rates

Interest rates. The Agricultural Development Bank (ADB/N) is the main institution providing subsidized credit for agriculture. Commercial banks have been instructed by the Nepal Rastra Bank to invest ten percent of their deposits in the priority sector which includes agricultural and rural development projects, but such lending has not exceeded two percent of ADB/N's disbursements (26). In 1984/85, ADB/N's outstanding loans totalled NRs.1065 million, with NRs.234 million for crop production loans (27). Crop production loans in 1984/85 totalled NRs.164 million (Table 16, p.31).

Current rates of interest charged by ADB/N on loans to individual borrowers range from 10 to 17 percent depending on the purpose and duration of the loan (Table 17, p.31). Nominal interest rates have not varied with inflation, and in some years the real interest rate (nominal rate less inflation) has been negative. Repayment of ADB/N loans has been uneven. The ratio of delinquent loans to outstanding loans has increased nearly every year, and now stands at about 40 percent (28).

Subsidized institutional credit for agriculture meets less than one-third of the total demand. Over three-fourths of borrowing families obtain credit from private sources, primarily friends, relatives, and village moneylenders. (Table 18, p.31). Large farmers obtain most of the institutional credit, while poorer villagers depend on private sources, which charge higher interest rates (Table 19, p.32). As with most subsidized, rationed commodities, credit has been allocated to people in positions of influence, not to people having the greatest need or able to use it most effectively.

Of the credit provided by the ADB/N, about one-third has been for production purposes. Until 1982, loans to cover the labor costs of cultivation were limited to 20 percent of the loan taken for fertilizer and seed; since 1982 loans to cover labor costs can equal the amount borrowed for fertilizer and seed. Loans for fertilizer and seed are provided as in-kind credit, while loans for labor costs during the planting and growing seasons are in cash.

An use for credit that has not been sufficiently recognized by official loan policies is the flexibility it can give farmers to hold products off the market until prices rise from their post-harvest low points. Informal moneylenders often require that loans be repaid at harvest time, forcing farmers to sell at low prices. A policy of providing credit specifically for marketing purposes could reduce inter-seasonal price variations and provide significant benefits to farmers.

Exchange rates. Until 1945, when paper currency was first issued by HMG, Indian currency was the only paper medium of exchange in Nepal. Fixed exchange rates were announced for the Indian Rupee and U.S. Dollar in April 1960. Since 1966, when the Indian Rupee was devalued and the Nepalese Rupee (NC) was exchanged almost at par with the Indian Rupee (IC), the Nepalese Rupee has been devalued four times with respect to the Indian Rupee, and now the exchange rate is NC 168 = IC 100 (Table 20, p.32). There has always been free official convertibility of NC and IC, and IC circulates freely in the Tarai. NC has not been freely convertible into other currencies, and has generally been overvalued.

With respect to hard currencies, Nepal maintained a system of fixed exchange rates--with infrequent adjustments--until June 1983, when a floating exchange rate system using a basket of currencies was established. There is some evidence that there were only two currencies--the Indian Rupee and the U.S. Dollar--in this basket (29). In June 1986 the IC/NC rate was officially allowed to float, but the exchange rate has been steady. Despite a 17 percent devaluation in 1985, current black market exchange rates indicate that the Nepalese Rupee is overvalued against the U.S. Dollar by about 15 percent. Fluctuations in the black market rate indicate that it includes a premium for illegal activities, and is not an equilibrium rate based on the relative buying power of the currencies.

Nepal maintained a dual exchange rate for the U.S. Dollar between March 1978 and September 1981. During this time exporters receiving dollars could exchange them for Nepalese currency at a premium (33 percent until February 1980, then 17 percent) over the normal exchange rate (30). This system was used to provide incentives to all types of exporters. However, as most agricultural exports are to India, this system did not have a substantial impact on agricultural exports.

Most agricultural trade does not use official channels to obtain foreign exchange. Indian currency is readily available at Nepalese banks and is widely circulated in the Tarai where most of Nepal's agricultural surplus is produced. Overvaluation relative to hard foreign currencies probably has less direct effect on agricultural trade than overvaluation relative to Indian currency. Prices adjust quickly when the exchange rate with India changes. After the devaluation in November 1985, Tarai markets responded within hours by raising prices.

In general, exchange rate policies, combined with import and export license regulations, have made investments in the agricultural sector less remunerative than investments in small-scale industry and trade. As a result, considerable energy is devoted to obtaining scarce foreign exchange through trade in consumer goods, and little effort is devoted to improving the prospects for agricultural exports.

Notes to Chapter II

- (1) Parts of this and the following section originally appeared in Radelet and Wallace, 1985.
- (2) Scherer, 1985.
- (3) One writer notes: "Probably the only justification for the continuation of subsidy program in the Valley may be the low income wage earners, who have also been benefitted by the program. However, in no case does the Valley deserve subsidized rice in quantities it has been receiving currently." (APROSC October 1984b, p.16.)

Another states: "Following the policy of a just social development for all inhabitants of Nepal, the prevailing HMG price strategy providing foodgrains at subsidized prices to consumers in high income areas such as Kathmandu cannot be backed by supporting arguments. This situation aggravates even further when taking into account that ... the Kathmandu Valley population already benefits from the most advanced infrastructures which have been developed at the expense of the whole country." (Scherer 1986, p.4.)
- (4) Scherer, 1985.
- (5) NFC; Scherer, 1985; DFAMS 1983, 1985.
- (6) See DFAMS, March 1984 for detailed information on the Far Western Development Region.
- (7) APROSC, October 1984b, pp.27-28.
- (8) Nepal Rastra Bank, Commercial Banking Statistics, No.20, February 1986.
- (9) Calculated from Scherer 1985, 1986.
- (10) APROSC, July 1982a, Annex 9.
- (11) Scherer, 1986, pp.1-2.
- (12) Scherer (1986, p.22) notes: "Since it is the objective of HMG to secure staple prices for the consumers with low incomes, the sales program and foodgrain stocks should ... continue to concentrate on low-priced basic commodities and product qualities such as par-boiled rice, raw coarse rice, [and] wheat."
- (13) See Fletcher and Sahn, 1984 for a detailed analysis of food aid.
- (14) FAO, 1984.
- (15) Mudbhary, 1983, pp.35-36.
- (16) Sarma, 1984; Kahlon and Tyagi, 1983, pp. 7-15.
- (17) Lee, 1971.

- (18) Mudbhary, 1983; APROSC, October 1984a.
- (19) APROSC, June 1978, p.14.
- (20) Lee, December 1972.
- (21) EAPD/MFA, June 1972, p.5.
- (22) Hill, 1982.
- (23) Calculated from AIC data given in APROSC, April 1986, adjusted for current fertilizer prices.
- (24) FAI, 1985; AIC.
- (25) Timmer, 1986, p.26. The complete quotation is:
- . . . most price policies are implemented by interventions at the border--by taxing or subsidizing international trade in the commodity. It is quite difficult to implement a price policy in the absence of international trade in the commodity concerned; the mechanisms are much more complicated and require direct purchases and sales by a government-controlled marketing agent. Trade interventions, by contrast, can usually be implemented quite simply by the customs service, a government trading company, or both.
- (26) Nepal Rastra Bank, 1985, Tables 58, 90.
- (27) ADB/N, 1985, Table 3.
- (28) Nepal Rastra Bank 1985, Table 63.
- (29) Morris, 1984.
- (30) Mudbhary, 1983, Appendix 2.

Table 4. Monthly Foodgrain Price Correlations, 1975-1984

	Paddy			Rice			Wheat	
	UP	Bihar	WBeng	UP	Bihar	WBeng	UP	Bihar
India								
Nepal								
Kathmandu	0.73	0.65	0.65	0.90	0.92	0.93	0.79	0.87
E Tarai (Morang)	0.82	0.87	0.85	0.86	0.94	0.93	0.81	0.89
W Tarai (Banke)	0.90	0.87	0.82	0.93	0.91	0.95	0.88	0.88

Sources: Ministry of Agriculture, Government of India; DFAMS.

Table 5. Rice Levy Rates and Prices

Date	Rate (percent)	On	Price (NRs/mt)
2/75- 5/75	25	Exports	1393) this price was
5/75- 2/76	30	Exports	1393) 30-50 percent
2/76-11/76	25	Exports	1393) lower than REC
11/76-11/80	20	Exports	1393) purchase price
11/80- 3/83	10	Exports	2000
(no levy on exports to India)			
1983/84	25	Mills with \geq 25 hp	
coarse/fine paddy			1901/2000
coarse/fine rice			3410/3500
1984/85-1985/86	10	Mills with \geq 25 hp	
coarse/fine paddy			1970/2070
coarse/fine rice			3530/3620
1986/87		All foodgrain exports banned	

Sources: 1975-1983 from Mudbhary 1983; 1983/84-present from NFC.

Table 6. Public Foodgrain Procurement and Distribution (mt)

Procurement							
Year	Paddy	Rice	Wheat	Maize	Total Purchases	Aid	Total Procurement
1967/68	0	21657	0	0	21657	0	21657
1968/69	0	4998	0	0	4998	667	5665
1969/70	0	6504	0	0	6504	527	7031
1970/71	0	9325	0	0	9325	166	9491
1971/72	NA	NA	NA	NA	NA	0	NA
1972/73	NA	NA	NA	NA	NA	40400	NA
1973/74	NA	NA	NA	NA	NA	3200	NA
1974/75	NA	NA	NA	NA	20758	7914	28672
1975/76	7942	33549	706	0	42197	1493	43690
1976/77	0	34022	1792	0	35814	1091	36905
1977/78	2763	30035	1895	4266	38959	4658	43617
1978/79	0	24421	2335	5137	31893	7095	38988
1979/80	0	50148	608	744	51500	29287	80787
1980/81	1341	42851	544	0	44736	29634	74370
1981/82	1739	33378	245	0	35362	8813	44175
1982/83	527	43783	6267	748	51325	73372	124697
1983/84	1614	31600	1937	734	35885	13928	49813
1984/85	5488	14325	3769	0	23582	4008	27590
1985/86	1618	26791	4798	23	33410	0	33410

Distribution					
Year	Mountain	Hills	Kathmandu	Tarai	Total
1974/75	349	7289	16574	0	24212
1975/76	711	9835	15742	0	26288
1976/77	831	19865	11865	0	32561
1977/78	1297	15011	18292	0	34600
1978/79	1329	9543	18461	0	29333
1979/80	2692	19132	24985	0	46809
1980/81	4599	19071	26946	0	50616
1981/82	4031	14730	18206	0	36967
1982/83	9774	29835	31699	0	71308
1983/84	7422	20418	22483	0	50323
1984/85	5258	12892	20592	944	39686

Sources: 1967/68-1970/71 purchases were by the Food and Marketing Corporation; from EAPD/MFA March 1972. Food aid 1965/66-1980/81 from DFAMS June 1984. 1974/75 data from APROSC July 1982. 1975/76-1982/83 procurement from FAO September 1984. Distribution, food aid, and 1983/84 data from APROSC September 1982, and Scherer. 1984/85-1985/86 data from unpublished NFC records.

Table 7. Retail Prices of Foodgrains Distributed by NFC (NRs./100 kg)

Commodity	74/5	75/6	76/7	77/8	78/9	79/0	80/1	81/2	82/3	83/4	84/5	85/6
Mountains (Jumla)												
Pb Coarse Rice	322	302	302	302	302	302	302	440	550	525	680	680
Pb Fine Rice	328	310	310	310	310	310	310	450	610	610	790	790
Raw Coarse Rice	335	392	314	314	374	374	374	450	560	560	725	725
Raw Fine Rice	341	392	319	319	379	379	379	500	690	690	894	894
Wheat					248	248	248	248	248	440	455	455
Maize					227	227	227	227	227	227	338	338
Wheat Flour					282	282	282					
Hills (Bhojpur)												
Pb Coarse Rice	247	225	225	225	225	225	225	380	465	440	570	570
Pb Fine Rice	253	233	233	233	233	233	233	390	510	510	660	660
Raw Coarse Rice	259	221	238	238	298	298	298	390	475	475	615	615
Raw Fine Rice	266	216	243	243	203	203	203	440	590	590	764	764
Wheat					185	185	185	185	185	338	325	325
Maize					169	169	169	169	169	169	280	280
Wheat Flour					210	210	210					
Kathmandu Valley												
Pb Coarse Rice	250	225	225	225	225	225	225	340	445	420	420	420
Pb Fine Rice	300	275	275	275	275	275	275	350	485	485	485	485
Raw Coarse Rice	272	230	230	230	290	290	290	365	455	455	455	455
Raw Fine Rice	352	300	300	300	350	350	350	415	570	570	450	450
Wheat								185	185	305	290	290
Maize								169	169	169	260	260
Tarai												
Pb Coarse Rice								340	425	400		
Pb Fine Rice								350	450	450		
Raw Coarse Rice								355	435	435		
Raw Fine Rice								405	525	525		
Wheat								185	185			
Maize								169	169	169		

Sources: Scherer 1985; Scherer 1986.

Table 8. Nepal Food Corporation Finances (NRs. million)

Fiscal Year	74/5	75/6	76/7	77/8	78/9	79/0	80/1	81/2	82/3	83/4	84/5	85/6
Gross Sales	42	73	155	199	110	147	143	101	213	159	154	257
Cost of Sale	41	78	161	230	141	226	265	107	281	221	331	390
Net Profit	1	-4	-6	-30	-31	-78	-122	-6	-68	-62	-177	-133
Fixed Assets	6	7	16	19	20	21	23	25	29	32	37	39
Cur Assets	54	117	123	148	154	161	189	200	287	245	61	91
Cur Liabil	55	101	108	145	171	243	386	374	534	556	555	598
Subsidy	0	0	0	0	8	2	0	69	80	32	44	44
Sales 000 mt	24	26	33	35	29	47	51	37	71	50	40	54
Loss per mt	32	-165	-190	-881	-1073	-1673	-2414	-153	-954	-1240	-4372	-2453

Sources: NFC; Ministry of Finance. Estimates for 1985/86.

Table 9. Sources of Fertilizer, 1965/66-1985/86 (mt)

Year	Foreign Aid	Loan	Import	Total
1965/66	3169		0	3169
1966/67	0		6670	6670
1967/68	0		15011	15011
1968/69	0		12232	12232
1969/70	1000		18109	19109
1970/71	8100		10300	18400
1971/72	13064		11000	24064
1972/73	20174		44000	64174
1973/74	11950		25500	37450
1974/75	28500		31800	60300
1975/76	5000		0	5000
1976/77	20069		17000	37069
1977/78	37316		9000	46316
1978/79	42218		5000	47218
1979/80	25176		13325	38501
1980/81	31359		22825	54184
1981/82	25945	12075	41276	79296
1982/83	31300	20100	48400	99800
1983/84	17500	5000	55730	78230
1984/85	25600	59700	30000	115300
1985/86 (est)	53752	16370	45000	115122

Source: AIC.

Table 10. Sales of Fertilizer, 1965/66-1985/86 (mt)

Year	21:0:0	46:0:0	20:20:0	Other	Total
1965/66	1629			467	2096
1966/67	4000		1150	361	5511
1967/68	5664		3042	1253	9959
1968/69	7510	461	2668	5562	11611
1969/70	10133	547	4572	646	15898
1970/71	9929	2125	4558	1116	17728
1971/72	12295	2346	9203	1590	25434
1972/73	17005	5080	9024	1466	32575
1973/74	16857	6541	12127	1254	36779
1974/75	13440	7165	14056	1700	36361
1975/76	6507	10060	8332	6232	31131
1976/77	7755	13661	9423	6996	37835
1977/78	10410	16290	14253	4329	45282
1978/79	7376	19789	10649	7777	45591
1979/80	5060	22324	14718	8066	50168
1980/81	4079	23555	23710	2656	54000
1981/82	5217	26693	19892	4643	56444
1982/83	3559	32200	33748	4208	73715
1983/84	4887	43655	33480	4894	86916
1984/85	1637	46475	49611	2397	100120
1985/86 (est)	2071	44557	53967	1600	103795

Source: AIC.

Table 11. Seasonal Fertilizer Sales

Year	Summer (total nutrient-mt)	Winter	Total	Summer (nutrient-kg/ha)*	Winter	Total
1975/76	4994	7273	12267	2.9	22.1	6.0
1976/77	10274	4621	14895	6.0	13.3	7.2
1977/78	11723	5744	17467	6.9	15.7	8.4
1978/79	10884	7660	18544	6.3	21.5	8.9
1979/80	12645	8320	20964	7.5	22.7	10.2
1980/81	11202	11256	22458	6.5	28.7	10.6
1981/82	12943	10880	23823	7.3	27.2	11.0
1982/83	16033	15246	31279	9.1	31.6	13.9
1983/84	20967	16330	37297	12.1	34.6	16.9
1984/85	18675	24157	42832	9.6	53.5	17.8

Sources: AIC; DFAMS.

Table 12a. Fertilizer Sales by Region (total nutrient-mt)

Year	Mountain	Hills	Kathmandu	Tarai	Total
1975/76	107	1380	4575	6205	12267
1976/77	179	1823	5165	7727	14895
1977/78	455	2529	5379	9105	17467
1978/79	434	2588	6096	9427	18544
1979/80	652	3353	6498	10462	20964
1980/81	878	3150	7261	11170	22458
1981/82	913	3557	6780	12573	23823
1982/83	1232	4531	7498	18017	31279
1983/84	1305	5324	8431	22237	37297
1984/85	1284	8280	6555	26711	42832

Table 12b. Per-Hectare Fertilizer Sales by Region (nutrient-kg/ha)*

Year	Mountain	Hills	Kathmandu	Tarai	Total
1975/76	1.3	2.8	70.1	4.5	6.0
1976/77	2.2	3.6	81.7	5.5	7.2
1977/78	5.5	4.8	84.8	6.5	8.4
1978/79	5.3	4.8	93.7	6.8	8.9
1979/80	8.0	6.3	109.8	7.6	10.2
1980/81	10.6	5.6	121.5	7.9	10.6
1981/82	11.0	5.8	117.1	8.9	11.0
1982/83	15.5	6.8	125.5	12.5	13.9
1983/84	15.3	8.0	142.2	15.9	16.9
1984/85	12.7	10.3	111.9	18.5	17.8

Sources: AIC; DFAMS.

*Per-hectare information on fertilizer use is based on the assumption that all fertilizer sold is used on paddy, wheat, and maize, which cover 85 percent of Nepal's cropped area. Fertilizer is also used on vegetables and cash crops, so these statistics may slightly overestimate per-hectare fertilizer use, but relative magnitudes should not be affected.

 Table 13a. Fertilizer Prices (NRs./mt)

Year	21:0:0	46:0:0	20:20:0
1965/66	726		913
1966/67	693		913
1967/68	693	1313	913
1968/69	858	1400	913
1969/70	858	1400	1064
1970/71	850	1342	1057
1971/72	1000	1535	1557
1972/73	1000	1535	1557
1973/74	1658	2193	2214
1974/75	1658	2193	2214
1975/76	1870	2440	2270
1976/77	1870	2440	2270
1977/78	1870	2440	2270
1978/79	1870	2440	2270
1979/80	1870	2440	2270
1980/81	2400	3100	2800
1981/82	2400	3100	2800
1982/83	2400	3500	3250
1983/84	2400	3500	3250
1984/85	2400	3500	3250
1985/86	2400	3500	3250
1986/87	2850	3990	3990

Source: AIC.

 Table 13b. Regional Fertilizer Prices, 1971 (NRs./mt)

Fertilizer	Hills	Kathmandu	Inner Valley	Inner Tarai	Tarai
Ammonium Sulphate	1080	846	782	755	730
Complex	1965	1085	1038	1010	985
Urea	-	1378	1332	1310	1280
Muriate of Potash	1070	840	796	740	710
Single Super Phosphate	1010	770	710	690	660
Triple Super Phosphate	1190	965	920	868	840

Source: Lee December 1972, p.4.

Table 14. Fertilizer Subsidies and AIC Finances (NRs. 000)

Year	Sales	Cost	Profit	Transport Subsidy	Fert Sales (mt)	Loss/mt (Rs)
70/71	17640	24230	-6590	NA	17728	-372
71/72	32030	36880	-4850	1200	25434	-191
72/73	45530	67430	-21900	1550	32575	-672
73/74	71260	162020	-90760	1545	36779	-2468
74/75	72610	207740	-135130	2100	36361	-3716
75/76	70480	194910	-124430	2900	31131	-3997
76/77	83910	125680	-41770	3200	37835	-1104
77/78	111910	176370	-64460	2600	45282	-1424
78/79	102060	162730	-60670	5139	45591	-1331
79/80	112710	251210	-138500	5100	50168	-2761
80/81	159700	196000	-36300	9800	54000	-672
81/82	185100	289000	-103900	11250	56444	-1841
82/83	235800	295700	-59900	15200	73715	-813
83/84	323700	413800	-90100	15200	86916	-1037
84/85	402100	667000	-264900	18500	100120	-2646
85/86	561400	737700	-176300	20000	103795	-1699

Sources: 1970/71-1979/80 from ADB, Agricultural Sector Strategy Study, Vol.II, Appendices 4.24-4.25; 1980/81-1985/86 from Ministry of Finance. ADB source states that cost was calculated on the basis of international price, even though cost to AIC of fertilizer imported under aid was less. However, some fertilizer is also obtained under tied-source arrangements at higher than world prices so these figures are probably a reasonable estimate of total subsidies.

Table 15. Foodgrain Exports (mt) and Value (NRs. 000)

Year	Rice		Maize	
	Quantity	Value	Quantity	Value
74/75	68119	287000		
75/76	164901	518000		
76/77	135892	361100	2025	1400
77/78	62915	168800	4012	4700
78/79	67598	208400	3952	4900
79/80	12216	35900	2248	2700
80/81	45453	141700	17749	24500
81/82	53564	222600	15988	26100
82/83	2509	11300	214	300
83/84	16670	75200	201	400
84/85	52586	236300	7718	10700

Source: APROSC April 1986, p.63.

Table 16. Agricultural Development Bank Annual Disbursements (000 NRs.)

Year	Production	Mechan & Irri	Live-stock	Agri-Industry	Horti-culture	Tea	Total
1974/75	37082	17574	6201	116589	1103	3231	181780
1975/76	42011	22453	9636	34166	1804	4245	114315
1976/77	49920	36658	20012	107295	4737	3445	222067
1977/78	72245	43321	32813	121431	7561	5151	282522
1978/79	56428	41984	35965	70325	7852	5434	217988
1979/80	45199	22747	26182	43001	5227	5499	147855
1980/81	39140	17148	22632	44866	3145	7203	134134
1981/82	59589	27178	37830	121384	3611	6826	256418
1982/83	101692	66685	59708	104105	4032	9593	345815
1983/84	133146	70543	88674	175469	7391	1024	476247
1984/85	164430	95377	127790	164079	13551	1387	566614

Source: ADB/N.

Table 17. Agricultural Development Bank Annual Interest Rates (percent)

Year	Production	Mechan-ization	Irriga-tion	Live-stock	Agri-Industry	Horti-culture	Tea
Individual							
1970/71-74/75	10.0	9.0	7.5	7.5	8.5	7.5	7.5
1975/76	10.0	15.0	15.0	12.0	NA	10.0	10.0
1976/77-81/82	10.0	14.0	14.0	11.0	11.0	8.0	8.0
1982/83-85/86	15.0	17.0	12.0	12.0	11.0	10.0	10.0
Cooperatives							
1970/71-74/75	7.0	6.0	6.0	6.0	6.0	3.5	3.5
1975/76	7.0	11.0	11.0	NA	NA	NA	NA
1976/77-81/82	7.0	10.0	10.0	7.0	7.0	4.0	4.0
1982/83-85/86	11.0	13.0	8.0	8.0	7.0	6.0	6.0

Source: ADB/N.

Table 18. Families Borrowing from Various Sources (percent)

	Small		Medium		Large		Total	
	69/70	76/77	69/70	76/77	69/70	76/77	69/70	76/77
Institutional	15	17	25	30	31	43	18	24
Private	85	83	75	70	69	57	82	76

Small = 0-0.51 ha in hills, 0-2.71 ha in Tarai; Medium = 0.51-1.02 ha in hills, 2.71-5.42 ha in Tarai; large = above 1.02 ha in hills, above 5.42 ha in Tarai. Most Nepalese thus fall in the small category.

Source: NRB 1980, Vol.I, p.161.

Table 19. Amounts Borrowed from Various Sources (NRs./family)

	Small		Medium		Large		Interest Rates	
	69/70	76/77	69/70	76/77	69/70	76/77	69/70	76/77
Institutional								
Cooperatives	2	76	3	117	39	476	9.5-10	11-14
Village Committees	16		41		104		10	-
ADB/N		78	2	183	99	1000	10	8-14
LRSC*					257		10	-
Commercial Banks	4	35	22	71	49	271	9.5-10	11-18
Total	22	189	68	371	548	1747		
(percent)	(9)	(20)	(16)	(36)	(49)	(67)		
Private								
Village Moneylenders	102	265	139	247	272	402	10-50	15-100
Professional Lenders	6	10	3	14	20	154	18-35	15-100
Landlords	10	41	17	31	89	33	10-40	25- 60
Agricultural Traders	7	88	14	43	26	93	10-50	15-150
Friends and Relative	93	340	176	333	168	175	10-50	15-100
Others	5	17	5	2		20	10-50	10- 15
Total	223	761	354	670	575	877		
(percent)	(91)	(80)	(84)	(64)	(51)	(33)		
Total	245	950	422	1041	1123	2624		

* The Land Reform Savings Corporation (LRSC) was merged with the Agricultural Development Bank (ADB/N) in 1973.

Source: NRB 1980, Vol. I, p.168.

Table 20. Official Exchange Rates of US Dollar and Indian Rupee

Year	US Dollar Rates			Indian Rupee		
	Dual	Date	Normal	Date	Buying Rate	Date
1960/61			7.60		1.59	4/13/60
1966/67			7.60		1.01	6/06/66
1967/68			10.10	12/08/67	1.35	12/08/67
1971/72			10.10		1.39	12/22/71
1972/73			10.50	2/19/73	1.39	
1976/77			12.45	10/09/75	1.39	
1977/78			12.45		1.39	
1978/79	16.00	3/30/78	11.90	3/22/78	1.45	3/22/78
1979/80	16.00		11.90		1.45	
1980/81	14.00	2/21/80	11.90		1.45	
1981/82	14.00		13.10	9/19/81	1.45	
1982/83			14.20	12/17/82	1.45	
1983/84			14.40	6/01/83 float	1.45	
1984/85			17.40	11/02/84 float	1.45	
1985/86			20.40	11/30/85 float	1.70	11/30/85
1986/87			21.90	12/01/86 float	1.68	6/02/86 float

Sources: Mudbhary 1983; NRB 1986; Rastra Bank rates in Rising Nepal.

III. TRADEOFFS IN PRICE POLICY

Introduction

Nepal has faced few explicit dilemmas in its food price policies, partly because policies designed to achieve conflicting goals have never been fully implemented. The NFC has rarely purchased foodgrain at announced support prices, so the tradeoff between high producer and low consumer prices has not been squarely faced. Most of the fertilizer which AIC distributes is obtained through foreign aid grants or low-interest loans, so although some costs of subsidizing the fertilizer price have been implicitly borne by the Nepalese government, these costs have not explicitly appeared in the HMG budget. The losses resulting from NFC's distribution of food at subsidized prices and AIC's overall operating losses have both been covered from government-guaranteed loans from commercial banks, so the budgetary consequences of these policies have been delayed. Although government-guaranteed loans to NFC and AIC have increased the Nepalese money supply and may have weakened the financial position of the commercial banks, these consequences do not appear to have directly affected agricultural policy discussions.

The implicit costs of NFC and AIC operations are considerable. The opportunity costs of the food and fertilizer distributed by these agencies may be double the losses indicated in the agencies' financial statements. These costs include the actual costs of the food received as aid and the fertilizer received through long-term loans.

The long open border with India has prevented Nepal from even trying to insulate its domestic markets from international price movements, at least as these price movements are reflected in Indian markets. It has not been--and will not be--possible to insulate Nepalese markets from price changes in India. The potential conflict between reaping the benefits of using international prices and suffering the consequences of unfavorable international price movements has thus not been an issue.

If Nepal succeeded in implementing policies that have heretofore only been announced--such as supporting output prices, distributing food at subsidized prices to meet food deficits, and providing sufficient fertilizer at subsidized prices to significantly increase production in food deficit areas--the dilemmas inherent in the tradeoffs between conflicting objectives would have to be faced unless market input and output prices and consumer and producer responses made it easy to achieve policy objectives. For the present, Nepal faces a different set of problems within each of the policies it is trying to implement.

Nepal has tried to achieve its food policy objectives through three policy instruments: rice and wheat price supports, fertilizer price subsidies, and consumer food subsidies. The first two policies attempt to increase production by raising the output/input price ratio; the third attempts to partially overcome food deficits and thus improve the nutritional status of disadvantaged citizens. Food subsidies have been used primarily to keep prices low for some consumers in Kathmandu, and thus this policy must be evaluated on political as well as economic grounds--its purposes go well beyond improving the nutritional status of people living in food deficit areas. Economic analysis can be used more directly to evaluate output price supports and fertilizer subsidies.

Economic Considerations in Foodgrain Distribution

Scherer (1) provides a thorough description and analysis of Nepal's foodgrain distribution policy from a management perspective. His recommendations include:

- emphasizing local production rather than distribution investments;
- replacing subsidized distribution with an intervention policy at NFC's cost price;
- procuring foodgrain at Tarai prices plus full transport costs, thus stimulating local production efforts;
- providing budget funds for disaster and relief operations;
- providing food allowances rather than entitlements to government officials.

If these recommendations are implemented, the economic efficiency and equity of NFC operations would improve considerably. Increasing food production in deficit areas is usually cheaper than distributing food to those areas. This is particularly true for remote mountain regions where air transport is often used for foodgrain distribution.

Buying local grain when the market price is less than the Tarai price plus transport costs, and selling this grain when the market price exceeds this import cost, would both rationalize NFC's financial situation and provide an incentive for local production. In this way NFC could provide a marketing service that would benefit both producers and consumers in food deficit areas.

Including NFC in the government budget--at least for operations not designed to be financially self-sufficient--would also help rationalize NFC's financial situation. This would both reduce or even eliminate the need for continual borrowing, and provide a forum for explicitly making decisions about the planned level of NFC disaster and relief operations.

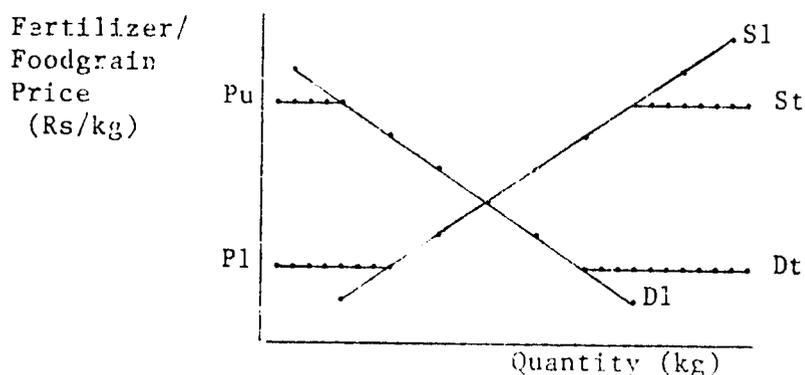
Providing rupees rather than rice to government officials should help make NFC stocks available to poor people in times of food shortages, consistent with the stated objectives of the food distribution program. This would bring some NFC costs into the government budget, and help make explicit the actual cost of NFC's distribution program.

Scope for Price Policies

The scope for using output price supports and fertilizer subsidies to influence food production in Nepal is limited as a result of the long open border with India and the relative sizes of these markets. (Indian states bordering Nepal--West Bengal, Bihar, and Uttar Pradesh--produced 44.3 million mt of cereal in 1983/84, while Nepal produced 4.3 million mt. In these states 3.8 million mt of fertilizers were sold in 1983/84, compared to less than 0.1 million mt in Nepal (2). Nepal can buy from or sell to the Indian market without affecting Indian prices.) These factors usually insure that the Nepalese price of any agricultural input or output is equal to the Indian border price plus or minus transportation

and transaction costs, including taxes and trade regulations and bribes to border customs and inspection officials. As a result, Nepalese prices can be controlled with price policy instruments only within upper and lower bounds defined by transport and transaction costs (see Figure 1).

Figure 1. Foodgrain and Fertilizer Demand and Supply



Pu = Indian price plus transport/transaction costs; import price
 Pl = Indian price minus transport/transaction costs; export price
 S1 = Local supply (Nepal only); St = Total supply (Nepal plus India)
 D1 = Local demand (Nepal only); Dt = Total demand (Nepal plus India)

Above price Pu, Nepalese farmers are willing to supply foodgrain, but Indian farmers will supply more than enough for the Nepal market at price Pu, making the total supply curve St elastic. Below price Pl, the total demand curve Dt becomes elastic because Indian consumers will buy all that Nepalese farmers can produce at price Pl. Similarly, above price Pu, fertilizer supply is elastic because villagers can bring as much as they want across the border from India at price Pu. Below price Pl, demand is elastic because Indian farmers and traders will buy all of Nepal's fertilizer. This discussion of the relationship between the national Nepalese and Indian markets also applies to the relationship between the mountain/hill/Kathmandu and Tarai regional markets--transport and transactions costs are the underlying feature, not the existence of national boundaries.

As they depend on transport and transactions costs, Pu and Pl are not the same in all regions. Pu is highest in the hills and mountains, lowest in the Tarai, and in between these two in the Kathmandu Valley, while the opposite holds for Pl. Transport and transactions costs may not be symmetrical for imports and exports: anecdotal evidence indicates that the informal costs of transporting goods north across the border from India to Nepal are higher than costs in the other direction.

Thus, there are both upper (Pu) and lower (Pl) bounds on Nepal's foodgrain and fertilizer prices. Below Pl demand from India swamps the market, and above Pu supply from India swamps the market. It is only for prices between Pl and Pu, where goods are untraded and will not move north or south across the Indian border, that Nepalese price policy can be effective. The larger the size of the range between Pl and Pu, the greater the scope for price policy in Nepal. This price range varies for different commodities and for different regions of Nepal. It is

generally greater for cash crops than for food crops--sugarcane is bulky, and the Indian tobacco and cotton markets are some distance from Nepal's border. It is virtually zero for the Tarai, moderate for the Kathmandu Valley, higher for the hills, and highest for the mountains. Thus, Nepalese prices in the Tarai are generally affected more by Indian prices than by Nepalese production.

Any attempt to use price policy instruments to move Nepalese commodity prices outside the range defined by P1 and Pu will lead to income transfers from the policy implementing agencies to the individuals who receive the commodities. Individuals who receive subsidized commodities such as fertilizer can sell them at the Indian price and capture the difference as income. Supports for Nepalese crop prices will transfer income to individuals who buy at Indian prices and sell to the intervention agency. Even if beneficiaries of government policy do not actually buy or resell goods at Indian prices, their real incomes will increase.

The above analysis applies to all traded commodities. The effect of the open border and different price policies in India and Nepal are perhaps best illustrated by the situation in the eastern Tarai, where a variety of consumer goods are available primarily to satisfy Indian demand, and where a system of "carriers" operates to transport goods both ways across the border, often at night.

One way to overcome the constraints arising from the long open border is to concentrate agricultural policy efforts on nontradable goods. If investments are made which cannot be shifted from Nepal to India, the open border is not a problem. For example, investments in irrigation and transportation are nontradable. Unfortunately the history of public sector irrigation efforts in the Tarai is not impressive, and little public sector work has been done to improve irrigation capacity in the hills. While all-weather roads are probably not economic for much of Nepal's rugged terrain, investments in suspension bridges, improved trails, and perhaps ropeways could have high payoffs.

Improving access to in-kind credit for fertilizer purchases is another possible way to concentrate on nontradable goods. While ultimately all credit is fungible, in-kind credit for fertilizer purchases by mountain and hill farmers is relatively difficult to trade. However, credit is not the main constraint to fertilizer use: timely availability is a much bigger problem.

The transferability of research results is also limited, especially for Nepal with its diverse variety of microclimatic regions. Although technology appropriate for the Indian plains can be readily adopted to conditions in the Tarai, this is not the case for the hills and mountains, and in any case relatively little work has been done to improve yields of the "minor" food crops--millet, barley, and potatoes--grown under rainfed conditions in Nepal's uplands. Thus, investments in research--particularly for rainfed hill and mountain crops--could have high returns. However, as Yadav (3) makes clear, additional funds would not entirely solve the problem of low productivity of the existing research system. Conceptual and institutional changes are needed to improve the research environment, and these will take time and effort.

Output Price Supports

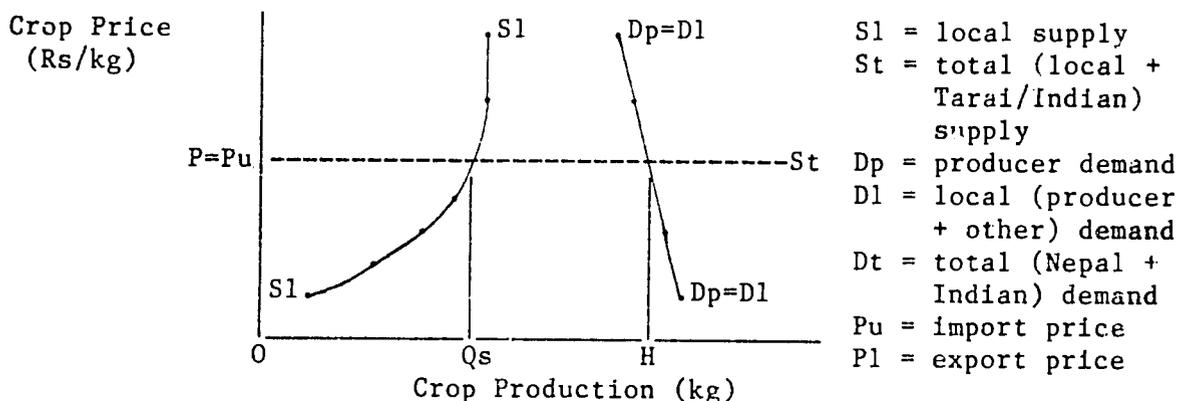
The local effects of output price supports depend on the slope of the supply curve and on the possibilities for importing foodgrain. The more elastic the supply curve, the more impact price supports will have on local production. The lower the cost of importing foodgrain, the more impact price supports will have on local food supply through increased imports. In the mountains and hills, supply curves are relatively inelastic and import transport costs are high. In Kathmandu, supply is more elastic, and import costs are lower. Supply is most elastic in the Tarai, and import costs there are almost zero. Thus, from a supply side perspective, output price supports should be most effective in increasing local food production and supplies in the Tarai.

An examination of the demand side supports this conclusion. Households with more than 0.5 ha of land usually produce something for market sale, and their production decisions are affected by output prices. Households with less than 0.5 ha of land (over half of the population) usually produce almost exclusively for home consumption, selling only enough output to purchase essential needs of other commodities or to pay debts. Landless people can also be divided into two groups: those whose incomes are received in cash (mostly civil servants and a few business people), and those whose incomes are received in kind (mostly agricultural laborers). Subsistence farmers live in the mountains and hills; market-oriented farmers live in the Kathmandu Valley and in the Tarai; cash income earners live in the Kathmandu Valley (and a few other towns); and in kind income earners live mostly in the Tarai. Supply and demand relationships for these regions are shown in Figure 2 (p.38).

In the mountains and hills, nearly all the food that is produced is consumed by the producing households themselves, and even then there is a foodgrain deficit. Many villagers migrate to India on a seasonal basis to augment their incomes, returning with either cash or food and meet part of their consumption needs from Indian agricultural production. In the Kathmandu Valley, the demand for home consumption by foodgrain producers is augmented by the demand from cash income earners living in Kathmandu, and as a result the Kathmandu Valley has a net food deficit. (Demand is like that in Kathmandu in a few other small urban areas.) In the Tarai, the demand for home consumption by foodgrain producers (including demand by agricultural laborers) is less than the local supply. Surplus production is used to meet demand from the mountains and hills, the Kathmandu Valley, and India.

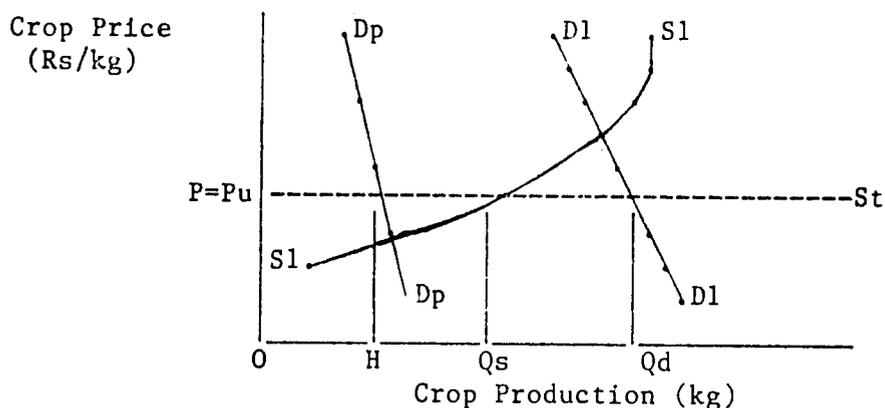
From a food security and national food balance viewpoint, Nepal would like to have the Tarai surplus ($Q_d Q_s$ in Figure 2c) exceed the total deficits in the mountains and hills ($Q_s H$ in Figure 2a) and Kathmandu ($Q_s Q_d$ in Figure 2b). However, even if the Tarai surplus exceeds the sum of the mountain, hill, and Kathmandu deficits, there must be an effective mechanism for procuring surplus Tarai production, transporting it to deficit areas in the mountains, hills, and Kathmandu, and distributing it to poor people living there. Without such a mechanism, surplus production will be sold to Indian traders and consumers.

Figure 2a. Foodgrain Supply and Demand--Mountains and Hills



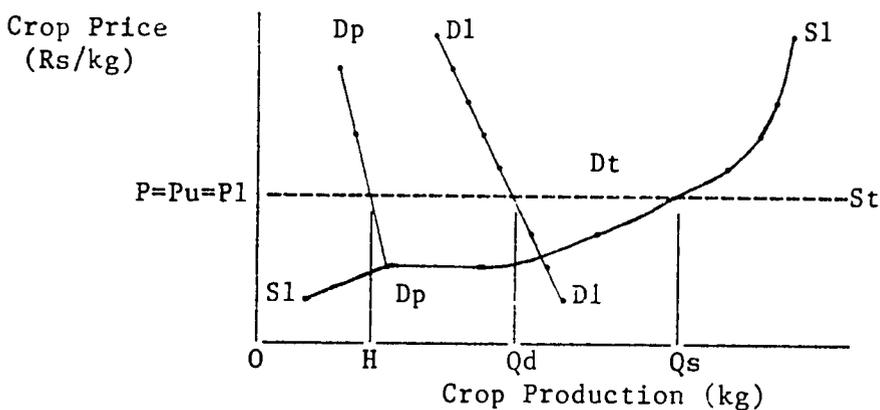
Q_s = Household foodgrain production; H = Foodgrain consumption
 Q_sH = Foodgrain deficit (met by imports or seasonal migration)

Figure 2b. Foodgrain Supply and Demand--Kathmandu Valley



H = Household foodgrain consumption by producers
 HQ_s = Foodgrain sold by producers (marketed surplus)
 Q_s = Local foodgrain production; Q_sQ_d = Foodgrain deficit

Figure 2c. Foodgrain Supply and Demand--Tarai



H = Household foodgrain consumption by producers
 HQ_s = Foodgrain sold by producers (marketed surplus)
 Q_s = Local foodgrain production; Q_dQ_s = Foodgrain surplus
 At quantities greater than Q_s , the total demand (D_t) and supply (S_t) curves coincide if $P_u=P_l$.

A crop price increase will increase production in the hills and mountains only marginally. There will be some production response in the Kathmandu Valley (primarily by using more fertilizer and labor inputs) and more response in the Tarai (by using more of all inputs, including land for winter crops such as wheat).

Even if there were a greater production response to prices in the hills, there are practical obstacles in implementing an output price support policy there. Hill markets are fragmented, with high transport costs from one small valley to another, so the government might have to open hundreds of shops to have a significant impact on food prices. (4)

Nepalese farmers--particularly Tarai farmers--do respond to market prices in making decisions related to agricultural production. This was dramatically illustrated in 1983/84, when wheat production was over 670,000 mt as a result of good weather in 1983/84 and good prices in 1982/83, a poor harvest year. Prices fell as low as NRs.1.65 per kg, nearly 50 percent below prices of the preceding year, primarily as a result of the good harvest in India, and because some food aid for the 1982/83 drought arrived late. Farmers complained loudly to HMG, but the government did not respond, and farmers were forced to absorb losses. In 1984/85 wheat production declined by over 130,000 mt, mostly as a result of reduced area devoted to wheat cultivation in the Tarai. AIC even had to auction unsold improved wheat seed because farmers' demand was so low. On the other hand, oilseed area and production increased in 1984/85, partly because oilseed prices had been high in 1983/84. Farmers respond to price movements, but these movements are determined by Indian markets: HMG cannot influence agricultural prices in the Tarai.

Another approach to analyzing output support prices is to examine buyers and sellers in local foodgrain markets. In the mountains and hills, the buyers and sellers of locally-produced foodgrains are the same people--villagers producing grain and eating it themselves. (Many of these villagers are also buyers of food in Tarai or Indian markets on a seasonal basis.) In the Kathmandu Valley, buyers include many cash income earners who are not also food sellers. In the Tarai, buyers also include many people (particularly traders who in turn sell food in Kathmandu or India) who do not produce food for sale.

When buyers and sellers of foodgrains are the same people, a price support can directly increase production only if a new buyer, such as the government, enters the market to purchase the price-supported grain and producers can buy another grain at a lower price. This is not the situation in Nepal's mountains and hills, so a price support cannot be expected to increase grain production there (5). However, food price increases in Tarai and Indian markets may induce villagers to devote more resources to local food production as the cost of importing food rises. (While NFC has recently made token attempts to procure foodgrain from hill producers, it is not practical to both support production and subsidize consumption for the same foodgrain for the same villagers.)

On the other hand, when foodgrain buyers and sellers are different people--as in the Kathmandu Valley and the Tarai--a price support can increase production. As there is more scope for increasing production by increasing crop intensities and use of fertilizer in the Tarai, a price support would probably have more impact there than in Kathmandu.

However, this conclusion--supporting output prices in the Tarai--cannot be implemented for the reasons indicated above: price supports are constrained to operate within the band defined by transport and transactions costs from the Indian border, and are impossible to implement in the Tarai.

Thus, output price supports are theoretically most effective precisely where they cannot practically be implemented. Reducing the cost of production by subsidizing fertilizer prices may theoretically offer more scope for encouraging increased production, but this policy also faces severe practical constraints, particularly in the Tarai.

Fertilizer Subsidies

The main objective of a fertilizer subsidy is to increase crop production by reducing the cost of an important input. This should encourage farmers to use more fertilizer, thus increasing overall crop output. A subsidy is economically efficient if farmers are using less than optimal amounts of fertilizer and the subsidy provides an incentive for them to move them closer to the optimum. More specifically, a fertilizer subsidy is efficient if the total real cost of the additional fertilizer used is less than the value of the increased output.

Total fertilizer sales are now over 100,000 mt per year, with urea and complex each accounting for about half the total. Current official prices for urea and complex are both Rs.3.99 per kg, but actual costs are NRs.5.13 and NRs.6.83. Thus, the subsidy per kg is about one-third of actual cost, and total subsidy costs are more than NRs.185 million per year--over US\$8 million at the official exchange rate. Although it is not in the national budget, this subsidy is more than one-fifth of the expenditure devoted to agriculture. Before the price increase in May 1986, the subsidy was estimated at NRs.330 million per year (6).

From a practical policy viewpoint, a subsidy is more effective the more elastic the demand for fertilizer, because a small subsidy will lead to a significant increase in fertilizer use and crop output. (In theory, a general tax-and-subsidy policy might include efficient subsidies for goods whose demand was inelastic, but as a practical matter Nepal and most developing countries cannot use tax policy to fine-tune and balance subsidy policy.) However, the price elasticity of demand for fertilizer in Nepal is probably low--at least as calculated from changes in the announced official price. This low elasticity is one result of the currently low use rate and the limited supplies available at the official price.

Estimating the price elasticity of fertilizer demand from secondary data is not easy. Fertilizer prices and official import quantities are fixed by the government, so there is little or no variation in prices, and observed quantities sold probably lie below the true demand curve at the official price. The effects of year-to-year price variations on sales are difficult to distinguish from the effects of increased knowledge about and experience with fertilizer use.

An informal survey of 264 farmers using fertilizer on the 1983/84 wheat crop provided several useful results (Table 21, p.50). Demand for

fertilizer does not change dramatically with changes in price--demand is relatively inelastic. Demand is more elastic in Kathmandu than in the Tarai and the hills, but the differences are not significant. Smaller farmers are more responsive to price changes than larger farmers. (7)

Farmers reported a variety of problems with obtaining and using fertilizer, but one stood out: fertilizer is not available on time (8). Over a third of the farmers were unable to get fertilizer when they needed it. One tenth reported that lack of water was a problem, and one tenth reported both availability and water problems. One fourth had no difficulties obtaining or using fertilizer. The price of fertilizer is generally not perceived as a constraint to increased use: fewer than one sixteenth of the farmers interviewed indicated that cost was a problem.

These responses clearly show that availability is a much greater problem than cost. This indicates that farmers would be willing to pay more for fertilizer if it were available on time. The price elasticity estimates presented in Table 21 are thus probably over-estimates--demand is probably less elastic than these estimates indicate.

Variations in fertilizer use can be partly explained by access to information about fertilizer use, by fertilizer/crop price ratios, by control of water, and by adoption of high-yielding varieties.

Access to information about fertilizer use. Kathmandu farmers have more experience with fertilizer use than Tarai and hill farmers. People living in Kathmandu are more educated and have greater access to information than people living elsewhere in Nepal. Most government and foreign aid project offices are in Kathmandu, and as a result Kathmandu is the main channel for obtaining and disseminating information. As the availability of commodities and use of new technology follow the dissemination of information, the use of fertilizer use has spread faster in Kathmandu than in the Tarai and hills.

A fertilizer price increase may thus not decrease fertilizer use at all--it may only slow the rate of growth. Tarai and hill farmers are increasing fertilizer use faster than Kathmandu farmers, and they may be simply catching up on the learning curve. This rate of growth will slow more in the Kathmandu Valley than in the Tarai and the hills, though fertilizer use is likely to continue to increase in all areas.

Fertilizer/crop price ratios. Kathmandu farmers receive higher prices for their crops than Tarai farmers, while hill farmers often do not produce enough to sell. Also, despite the uniform national fertilizer price, hill farmers face higher fertilizer prices--in terms of greater transport and waiting costs, or higher costs of obtaining credit from institutional or informal sources--than other farmers.

Thus, Kathmandu farmers receive more benefits from fertilizer use than Tarai farmers because crop prices are higher, and they receive more benefits than hill farmers because fertilizer prices are lower. The net effect is that Kathmandu farmers face lower fertilizer/crop price ratios than hill and Tarai farmers, they thus receive greater benefits from fertilizer use, and as a result use more fertilizer.

The effect of an increase in the national fertilizer price in this situation is best described with an example. For illustrative purposes let the price elasticity of fertilizer demand be -0.5 for all of Nepal. If the national fertilizer price is doubled, Kathmandu farmers will cut their fertilizer use by half, because their fertilizer/crop price ratio has been doubled. Tarai farmers will cut their use by less than half unless the price in India is also doubled, because they can buy fertilizer from India by paying the small extra transport cost, so a doubling of the Nepal fertilizer price will not double the fertilizer/crop price ratio for farmers who are willing to cross the border. With a limited supply in Nepal, the price which determines fertilizer use at the margin for most Tarai farmers is the Indian price, so changes in the Nepalese price will not influence Tarai fertilizer use. Hill farmers will cut their fertilizer use by less than half because their fertilizer price is the sum of the national price plus the extra transport costs of obtaining fertilizer, and thus their fertilizer/crop price ratio is less than doubled when the national price is doubled.

Moreover, a rise in the national fertilizer price will increase the availability of fertilizer, because farmers will have an added incentive to bring fertilizer across the border from India. The AIC would also be able to supply a much greater amount of fertilizer for the same budget if the selling price of fertilizer were raised.

While conceptually the lack of local availability of fertilizer is the same as a high price (the cost of obtaining the fertilizer elsewhere plus transport costs), local availability promotes learning about fertilizer both for farmers who do and those who do not use it. There are thus some benefits from fertilizer availability which are not reflected in the direct costs and benefits of fertilizer use. As more is learned about fertilizer, more should be used where the value of increased output is greater than the additional cost. There is a circle here: availability and profitable use increases information and learning, which in turn increase demand and use, so lack of access to fertilizer is different than access at a high price. Lack of availability in the mountains and hills reinforces the conclusions of the analysis above.

Control of water. Hill and mountain farmers have less control over water supplies than farmers in the Kathmandu Valley and the Tarai. Increases in crop production resulting from fertilizer use are more variable where water is less certain, so risk-averse hill and mountain farmers will purchase and use less fertilizer than their Kathmandu and Tarai counterparts.

Adoption of high-yielding varieties. Farmers in the Tarai and Kathmandu Valley have adopted high-yielding varieties (HYVs) of rice and wheat more than their hill and mountain counterparts. This is partly the result of information about HYVs, and partly the result of seed availability. However, the key factors are probably geography and climate: mountain and hill farmers grow less rice and wheat--and more maize, millet, and barley--than Kathmandu and Tarai farmers. There are HYVs for rice and wheat, but not for millet and barley.

These are not mutually exclusive explanations of fertilizer use. In fact, the effects of access to information, fertilizer/crop price ratios, and control of water all lead to higher fertilizer consumption

and greater response to fertilizer price changes (at current consumption levels) in Kathmandu than in the Tarai and the hills. While it is difficult to determine the relative importance of these effects, all contribute to significant differences in fertilizer use.

The conceptual and empirical analyses both indicate that farmers in the Tarai, hills, and Kathmandu Valley will respond differently to an increase in the fertilizer price. Tarai farmers--who use little fertilizer, have some experience and relatively easy access to information about fertilizer, and have an alternative source of fertilizer in India--are unlikely to decrease their use if the price increases. Hill farmers--who use little fertilizer, have little experience and difficult access to information, and have transport costs on top of the official price--will decrease their use little if any if the price is increased, particularly if more fertilizer is available as a result of the price rise. Kathmandu farmers--who use much fertilizer, and have both experience and access to information--will respond more like profit-maximizers and may decrease their use if the price is raised.

An increase in the fertilizer price will least affect the Tarai, where the most productive cropland is; it will have some effect in the hills, where the poorest people live; and it will have most effect in Kathmandu, where the most political power is.

Economic calculations. At the farm level, the economics of fertilizer use are relatively simple. Fertilizer now costs NRs.4.00 per kg. The most commonly-used fertilizers, urea and complex, have 46 and 40 percent nutrient content, respectively. Yield-response ratios for improved varieties of paddy and wheat probably lie between 10 and 15. The value of these crops is NRs.2.00 or more per kg. Thus, a farmer who spends NRs.4.00 on one kg of fertilizer can expect a return of at least $(.40) \times (10) \times (\text{NRs.}2) = \text{NRs.}8.00$, and often a return of as much as $(.46) \times (15) \times (\text{NRs.}3) = \text{NRs.}20.70$, with an average return of about NRs.14.00, a 3.5:1 benefit-cost ratio (9). (However, this is not a risk-free investment--weather can change the yield-response ratio and crop values cannot be known with certainty before harvest.)

This simple calculation, which has been verified many times on farmers' fields, indicates that even if the fertilizer price subsidy were completely eliminated and fertilizer sold for as much as NRs.7.00 per kg, farmers would still double their money on fertilizer investments. The fertilizer subsidy is not needed to make fertilizer use profitable. Indeed, subsidizing fertilizer may encourage unwise use, because farmers may use it when the return is more than the subsidized price but less than the real cost. The main point is worth repeating: a subsidy is not needed to make fertilizer use profitable (10).

If the subsidy were eliminated, revenues and costs would be equal, and there would be a total annual savings of over NRs.185 million. This money could be used to ensure that sufficient fertilizer is available on time where farmers need it or to make other improvements in the agricultural sector, such as supporting a substantially improved agricultural research program, or improving irrigation facilities.

The economic gains of eliminating the fertilizer subsidy depend on the price elasticity of demand for fertilizer, the yield-response ratio,

and crop values. The above conceptual and empirical analyses indicate that price elasticity is probably low, so eliminating the subsidy will not lead to a substantial reduction in fertilizer use. Fertilizer yield-response ratios and crop values are high enough to make it profitable for farmers to use fertilizer even if the subsidy is eliminated, so the overall gains of eliminating this subsidy should be significant.

The open border. Another practical reason for eliminating the fertilizer subsidy is the open border. The possibility of moving agricultural commodities both ways across the Indian border in response to price differences has been discussed above. An examination of relative prices in Nepal and India gives an indication of how frequently moving fertilizer one way or the other has been profitable (Table 22, p.51). For urea, Nepalese prices have sometimes been higher and sometimes lower than in India. For complex, prices have usually been higher in India.

The quantity of fertilizer which can move south across the Indian border when prices are higher in India is illustrated by a comparison of AIC fertilizer sales statistics and fertilizer use statistics from the Central Bureau of Statistics (CBS). The fertilizer use statistics (Table 23, p.51) should be compared to sales statistics (Table 10, p.29) for 1980/81 (winter crops) and 1981/82 (summer crops). The comparison is striking: AIC's records indicate that at least 54,000 mt of fertilizer were sold, but CBS's records indicate that less than 15,000 mt of fertilizer were used on the five crops which dominate fertilizer use.

An examination of district-level data from CBS reveals that in all areas of the country reported use was less than reported sales. The largest discrepancies are for the Kathmandu Valley, which indicates that considerable fertilizer is purchased there for use elsewhere.

There are several possible explanations for this large discrepancy between fertilizer sales and use: the CBS sample of households may have been unrepresentative; CBS respondents may have under-estimated fertilizer use; farmers may purchase fertilizer and store it for later use; fertilizer may be used on crops not included in the CBS statistics; or fertilizer may have been purchased in Nepal and used in India.

The first three possible explanations are unlikely. First, CBS used two-stage stratified random sampling to select 83,000 households from a population of 2.6 million households. With such a large random sample, substantial sampling bias in the results is extremely unlikely. Second, there is no reason for respondents to consistently under-estimate fertilizer use by nearly three-fourths--there is no potential benefit for doing so. Studies of nonsampling error in survey statistics in Nepal have shown large discrepancies between survey data and reality (11). However, as fertilizer is a purchased input--either for cash or credit--farmers should have better memories of fertilizer use than of other farm production statistics. Even if considerable memory bias is assumed (farmers were asked about fertilizer use during the preceding year), substantial differences remain between the CBS and AIC data.

Third, farmers are unlikely to buy more fertilizer than they need for the current crop season. Purchasing fertilizer diverts either cash or credit from other current consumption needs; and stored fertilizer can easily lose its nutrient value, particularly if it becomes wet.

Fertilizer is certainly used on other crops besides paddy, maize, wheat, sugarcane, and potato. However, these five crops cover over 85 percent of the total cropped area in Nepal, and total fertilizer use on vegetables, fruits, and cash crops such as jute and tobacco is unlikely to add substantially to the CBS statistics. AIC estimates that over 75 percent of all fertilizer sold is used on paddy, wheat, and maize. (12)

This leaves the fifth explanation: fertilizer was purchased in Nepal and used in India. In the two fiscal years partially covered by the CBS survey, about half the fertilizer sold in Nepal was sold in the Tarai and half in the mountains, hills, and Kathmandu Valley (Table 12, p.30). However, even if fertilizer used on crops not included in the CBS survey and non-sampling errors triple total fertilizer use (which is extremely unlikely), half the fertilizer sold in the Tarai would have to have been used in India to reconcile the AIC and CBS statistics.

The reason for moving fertilizer from Nepal to India is evident from an examination of fertilizer prices (Table 22, p.51). In early 1981, the urea price in India was IC Rs.2000 = NC Rs.2900/mt, while the price in Nepal was NC Rs.3100. On July 11, 1981 the price of urea in India was raised to IC Rs.2350 = NC Rs.3408/mt, while the price in Nepal remained at NC Rs.3100 until April 18, 1983. Similarly, in the beginning of 1981, the complex price in India was IC Rs.2050 = NC Rs.2973, while the price in Nepal was NC Rs.2800. In July the Indian price was raised to IC Rs.2400 = NC Rs.3380, while the Nepalese price remained at NC Rs.2800. Thus, for almost two years nearly ten percent profit could be made simply by moving urea fertilizer across the border, and over twenty percent could be made on complex. This situation changed in April 1983 when fertilizer prices in Nepal were raised.

Nepal faced the same problem in late 1985 and early 1986. As a result of the devaluation of the Nepalese Rupee on November 30, 1985 from IC Rs.100 = NC Rs.145 to IC Rs.100 = NC Rs.170, the price of urea in India (IC Rs.2250) increased from NC Rs.3263 to NC Rs.3825, while the price in Nepal was NC Rs.3500. Similarly, the price of complex fertilizer in India increased from NC Rs.3625 to NC Rs.4250, while the price in Nepal was NC Rs.3250. This situation was remedied in May 1986 when both urea and complex prices in Nepal were raised to NC Rs.4200 (reduced in July 1986 to Rs.3990). In the meantime, however, fertilizer dealers and traders reaped profits by buying in Nepal and selling in India. The policy implication is clear: fertilizer cannot be subsidized below the price of alternate (Indian) supplies (13).

Output Price Support vs. Fertilizer Subsidy

The above analysis indicates that output price support policies are likely to have little effect in the mountains and hills, simply because most farmers produce only enough for home consumption. Such policies may have an effect in the Kathmandu Valley, where there is still some scope for increasing production, but the likely outcome would be to encourage Tarai farmers to sell more of their output in Kathmandu. The greatest effect would be in the Tarai, where the potential for increasing production is the greatest. The problem with an output price support in the Tarai is that it is not possible to raise the price above the Indian market price without pulling grain north across the border.

On the other hand, while a fertilizer price subsidy is not particularly effective in promoting crop production, it might be used on equity grounds to benefit farmers in the mountains and hills as well as those in the Kathmandu Valley and the Tarai. However, the effective subsidy for Nepalese farmers, as measured against the opportunity cost of obtaining fertilizer from India, can never exceed internal transport costs in Nepal. The political power of Kathmandu residents and Tarai farmers, combined with financial limits on the ability of the Nepalese government to subsidize internal transport costs, will probably insure that few benefits of the subsidy are obtained by hill and mountain farmers. This analysis is summarized below. (Transport costs include transactions costs of bringing fertilizer and foodgrain from India.)

Analysis of Price Support and Fertilizer Subsidy by Region

Region	Transport costs	Fertilizer subsidy	Price support
Mountains	highest	subsidy possible; lowest output response; equity objective	steepest supply curve; support possible but ineffective
Hills	high	subsidy possible; low output response; equity objective	steep supply curve; support possible but ineffective
Kathmandu	moderate	small subsidy possible; moderate output response; political objective	steep supply curve; small support possible, but little effect
Tarai	nearly zero	subsidy not possible below Indian price	support not possible above Indian price

Notes to Chapter III

- (1) Scherer, 1985.
- (2) Ministry of Agriculture, Government of India, 1984; Fertiliser Association of India, 1985.
- (3) Yadav, 1986.
- (4) Price policies are most effective when domestic markets are integrated. Timmer (1985, pp.33-34) elaborates:

Commodities freely traded in markets with equal access to buyers and sellers are largely fungible. There is little difference between a ton of imported rice and a ton of domestic rice because the two commodities are very close substitutes in consumption. By subsidizing the price of the imported rice only, the market price of all rice can be driven down to the desired level . . . if quantities are unrestricted and trade among markets takes place, that is, if markets are integrated. This is a powerful result indeed and accounts for much of the popularity of price intervention as a tool of public policy in developing countries. By operating on relatively small amounts of easily controlled imports (or exports), the entire price structure for all the commodity produced and consumed within the country can be affected. This happens only because of the arbitrage feature between markets; low-priced commodities tend to find their way into higher-priced markets, and thus prices in the first market are raised and those in the second market lowered. Where domestic commodity markets are isolated, unconnected, or fractionated by poor infrastructure, communications, or direct government interventions in market activities, the type of price policy analysis carried out so far provides a quite incomplete guide to the ultimate impact of price changes.
- (5) On the other hand, most farmers believe that the distribution of subsidized foodgrain does not adversely affect incentives to increase production. See HMG June 1984, pp.4, 37-40.
- (6) Rising Nepal July 31, 1986.
- (7) Wallace, 1986.
- (8) This finding is confirmed by many independent studies: see, for example, periodic reports of the Integrated Cereals Project. Another problem sometimes mentioned by small farmers is the lack of availability of small quantities of fertilizer: many dealers are unwilling to open bags and sell less than 50 kg at one time.
- (9) An almost identical calculation is given in Mathema, Van Der Veen, and Anjan, 1981. See ARSAP, 1977; FADINAP, March 1984; and Integrated Cereals Project reports for a variety of similar calculations. For a review of fertilizer response studies, see Kupferschmidt, 1983.
- (10) For similar observations and recommendations made during the past 20 years, see MEP/DOA, 1966; Pant, 1984; APROSC, July 1985.

- (11) See Campbell, Shrestha, and Stone, 1979.
- (12) AIC undated.
- (13) Some Indian farmers prefer imported fertilizer from Nepal instead of Indian-made fertilizer, although chemically the two should be equivalent. As a result, Indian farmers may be willing to pay more than the official price for fertilizer from Nepal.

Table 21a. Farmers with Problems in Fertilizer Use

	Tarai		CHIT	RUPA	Hills		Kathmandu Valley		Total
	MORA	DHAN			SALL	BHAK	LALI	KATH	
None	3	9	21	7	6	12	3	9	70
Time (T)	7	9	14	16	12	12	8	15	93
Water (W)	2	5	1	1	0	6	3	10	28
T & W	13	8	0	1	1	0	0	1	25
Cost (C)	0	1	1	0	2	1	2	1	8
T & C	0	0	0	6	1	0	0	0	7
T & W & C	0	0	0	1	0	0	0	0	1
Other	6	1	2	8	8	0	7	1	32
Total	31	33	39	40	30	31	23	37	264

None = no problems obtaining or using fertilizer; Time = fertilizer not available on time; Cost = fertilizer too expensive; Other = other problems. Source: author's survey.

Table 21b. Price Elasticity of Fertilizer Demand

	Tarai		CHIT	RUPA	Hills		Kathmandu Valley	
	MORA	DHAN			SALL	BHAK	LALI	KATH
Urea N	31	31	34	31	23	31	22	37
UPRE	-1.39 (1.57)	-1.97 (2.67)	-0.64 (1.66)	-1.30 (1.94)	-1.47 (1.28)	-2.03 (1.91)	-1.58 (1.63)	-1.37 (1.48)
UPREW	-0.40	-1.01	-0.39	-0.52	-1.17	-1.72	-1.13	-1.34
UPRE0	12	14	26	17	7	12	10	18
UPRQ0	1	2	1	2	0	0	0	0
Complex N	27	30	0	1	22	11	6	2
CPRE	-0.54 (0.59)	-0.70 (1.03)	--	0.00 (0.00)	-0.90 (0.75)	-0.35 (0.43)	-0.88 (1.07)	-0.85 (0.10)
CPREW	-0.25	-0.59	--	0.00	-0.79	-0.57	-0.86	-1.47
CPRE0	10	16	--	1	4	6	3	0
CPRQ0	1	2	--	0	0	0	1	0

Urea N, Complex N = number of farmers using urea or complex;
 UPRE, CPRE = price rise elasticity of demand for urea (unweighted average across farmers);
 UPREW, CPREW = weighted price rise elasticity of demand for urea (weighted by fertilizer quantities);
 UPRE0, CPRE0 = number of farmers for whom UPRE or CPRE = 0--whose fertilizer use will not change if the price rises;
 UPRQ0, CPRQ0 = number of farmers who will not buy any urea or complex if the price rises.
 Means; standard deviations in parentheses. Source: author's survey.

Table 22. Nepal-India Urea and Complex Fertilizer Price Ratios

Year	Exchange IC/NC	NC Urea Price	IC Urea Price	Urea* Ratio	NC Comp Price	IC Comp Price	Comp* Ratio
1967/68	1.35	1313	840	1.16	913		
1968/69	1.35	1400	860	1.21	913		
1969/70	1.35	1400	943	1.10	1064		
1970/71	1.35	1342	943	1.05	1057	938	0.83
1971/72	1.35	1535	923	1.23	1557	1035	1.11
1972/73	1.39	1535	997	1.11	1557	1187	0.94
1973/74	1.39	2193	1842	0.86	2214	1400	1.14
1974/75	1.39	2193	1888	0.84	2214	2283	0.70
1975/76	1.39	2440	1750	1.00	2270	2571	0.64
1976/77	1.39	2440	1600	1.10	2270	2013	0.81
1977/78	1.39	2440	1550	1.13	2270		
1978/79	1.45	2440	1450	1.16	2270		
1979/80	1.45	2440	1908	0.88	2270	1500	1.04
1980/81	1.45	3100	2263	0.94	2800	1958	0.99
1981/82	1.45	3100	2350	0.91	2800	2313	0.83
1982/83	1.45	3500	2350	1.03	3250	2400	0.93
1983/84	1.45	3500	2350	1.03	3250	2250	1.00
1984/85	1.45	3500	2183	1.11	3250	2200	1.02
1985/86	1.70	3500	2250	0.92	3250	2500	0.76
1986/87	1.68	3990	2250	1.06	3990	2500	0.95

* (Nepal price/India price)/(IC/NC); a ratio greater than 1.0 means fertilizer is more expensive in Nepal than in India.

Source: AIC for Nepal prices; Fertiliser Association of India for Indian prices. Annual averages for Indian data are used for comparison with Nepalese data.

Table 23. Fertilizer Use 1981/82 (kg)

Crop	Holdings		Chemical Fertilizer Use		
	Number	Area (ha)	Number	Area (ha)	Quantity
Paddy	1021730	1394123	163604	106696	6340482
Maize	838596	522469	43154	14330	1379428
Wheat	649510	389172	174445	64781	5377063
Sugarcane	60157	32512	8585	3899	945975
Potato	193185	67403	14787	2211	196658
Total	2763178	2405679	404575	191917	14239606

Note: Fertilizer sales statistics (Table 10, p.29) are compiled by AIC for Nepal's fiscal year (July 16 to July 15), while fertilizer use statistics (Table 23) were recorded by CBS for the reference period of the National Sample Census of Agriculture 1981/82 (January 14, 1981 to January 13, 1982). Both statistics report gross fertilizer weight, not net nutrient content.

Source: CBS, National Sample Census of Agriculture 1981/82.

IV. CONCLUSION

Pricing Strategies: Intentions and Effects

Food subsidies for consumers. HMG's explicit policy objective with respect to foodgrain distribution has been to benefit consumers living in food-deficit areas. However, the actual beneficiaries of food subsidies have been residents of the Kathmandu Valley, the army, and government officials posted outside Kathmandu. Kathmandu Valley generally has higher targets for food distribution than the rest of the hills combined, and since 1980/81 these targets have always been exceeded. The political reasons for keeping prices for some consumers in Kathmandu low continue to weigh heavily in decision-makers' calculations, so it is likely that the future rhetoric of food distribution will emphasize poor villagers living in remote areas, and the reality will continue to benefit politically-favored groups.

High domestic transportation costs make it difficult to move food to villagers living in remote food-deficit areas. Until Nepal's rudimentary transportation network is significantly improved, financial constraints will complement political considerations to insure that the needs of poor rural villagers will remain secondary to the demands of politically powerful urban residents.

Output price supports. The stated policy objective with respect to output price supports has been to benefit producers in all parts of the country. However, in practice price supports have never been implemented--at most a support price has been used to obtain foodgrain for NFC distribution through levies on exporters and millers. Support prices have never provided an incentive for Nepalese farmers to increase production. The open border with India makes it impossible for Nepal to consider supporting grain prices above Indian market prices for the purpose of increasing production in Nepal.

Politicians continue to call for price supports to provide incentives and adequate remuneration to farmers. However, financial constraints--whether on or off the official budget--complement geographical reality, and the government is unlikely to announce any support price policy more ambitious than the past token efforts.

Fertilizer price subsidies. Policy objectives with respect to fertilizer subsidies have been to increase crop output by lowering the cost of production, and to benefit farmers living in remote parts of the country. The primary beneficiaries of the fertilizer subsidy have been the farmers in Kathmandu Valley who have received the most fertilizer, and traders who have been able to profit when prices have been higher in India. Lack of fertilizer availability is probably a greater constraint to increased use than high fertilizer prices. While crop production has increased since fertilizer was introduced in Nepal 20 years ago, the fertilizer subsidy has not been an important cause of this increase.

As with output price supports, the open border makes it impossible for Nepal to reduce fertilizer prices below Indian prices for the purpose of stimulating fertilizer use in Nepal. Financial constraints on the use of fertilizer subsidies have been minimal in the past, but some

donor agencies are pressing for more market-oriented price policies.
Key Pricing Issues

Nepal's long, open border with India and the relative sizes of the two markets have implications for Nepal's foodgrain and fertilizer price policies. As mentioned above, Nepal is like the flea on an elephant's back--no matter which way the flea turns, it will travel in the elephant's direction. The positive side of this analogy is that the flea can travel much faster on the elephant's back than it can hopping along by itself. Thus, while Nepal cannot maintain foodgrain or fertilizer price policies completely independent of India, it can take advantage of India's policies to help achieve its own objectives.

Thus, to the extent that Indian policies shield Indian producers and consumers from the adverse impacts of international price changes (especially with respect to fertilizer prices), Nepal gains. On the other hand, when these policies prevent Nepal from taking advantage of favorable international (or Indian) price movements, Nepal loses.

Indian minimum support and procurement prices are the most important factors determining support prices fixed in Nepal. As these prices have never decreased from one year to the next, it is probably safe for Nepal to announce last year's Indian procurement price as a way of providing a psychological guarantee to Nepalese farmers.

Nepal should explicitly recognize that domestic foodgrain and fertilizer market activities are determined by Indian prices, and that price policies are possible only within the range defined by Indian market prices, plus or minus the relevant transport and transactions costs. Any attempt to maintain prices outside this range will have adverse effects. When prices are low in Nepal, fertilizer and foodgrain will move south across the border, giving rise to shortages in Nepal. When prices are high in Nepal, these commodities will move north, and agencies responsible for maintaining high prices will transfer income to those individuals able to sell at support prices.

Financial constraints on implementing agencies are another important pricing issue. The losses of both the Nepal Food Corporation and the Agricultural Inputs Corporation have thus far been kept out of the official government budget. However, there is increasing pressure from major donor agencies to incorporate the budgets of these and other public enterprises into the national budget, and one effect of this may be to curtail significant expansion of these agencies' activities.

As the population shifts from the hills to the Tarai, so is political power. While in 1961 two-thirds of Nepal's people lived in the hills, by 1981 nearly half were in the Tarai, and the next census is likely to show a majority in the Tarai. Complementing this population shift are the communication and transportation networks, which are more developed in the Tarai than in the hills, and one result is likely to be a more vocal population with higher material and political expectations, and with fairly direct access to India as a source of both ideas and commodities. Some implications for food pricing policy are obvious: Nepal will be forced to take more explicit account of Indian policies and the effects of the open border.

Foodgrain Policies

Food subsidies for consumers. The main issue with respect to foodgrain subsidies for consumers is the cost of maintaining low prices for Kathmandu residents. The population of the Kathmandu Valley is growing faster than that of any other food-deficit area (but slower than the Tarai), so the costs of maintaining low prices for this population will continue to increase. As overall production is increasing slower than population growth, it will become more and more difficult to procure foodgrains through levies on domestic traders, and more open market purchases will be necessary, entailing higher costs.

A related issue is the ever-growing debt of the National Food Corporation. Until now most of these losses have been financed by government-guaranteed loans from Nepalese commercial banks, so all of these losses have not appeared in government budget calculations. However, the consequences of this practice eventually must be faced. The outstanding debt of the NFC is now nearly eight percent of the (M1) money supply, and the effect on the banking system of the outstanding loans to all public enterprises is significant. The willingness of donor agencies to continue to provide funds to support the NFC's current mix of activities is declining, so there is likely to be external pressure to reorient its activities, perhaps by providing more disaster relief for rural villagers and less food subsidy for urban consumers (1).

Current food subsidy policy implicitly includes both price and transport subsidies, with price subsidies being more important in Kathmandu and transport subsidies being more important in remote hill and mountain areas. If the government wanted to change its policy and target benefits more directly on poor villagers, a transport subsidy alone could be provided. Another way to help insure that needy people actually receive and consume subsidized food is to distribute only low-quality grain, rather than the selection now offered by the NFC, which includes several qualities of fine rice as well as parboiled rice.

Output support prices. Support prices for crops have never been implemented. The above analysis indicates that they would not be effective in increasing local production in any case. It is probably best for the Nepalese government either to refrain from announcing any support prices, and to explicitly recognize that Indian market prices and transportation costs determine most market prices in Nepal, or to simply announce last year's Indian support price as a psychological measure.

NFC may be able to provide significant benefits to farmers simply by opening small shops in major market areas, and by offering prices slightly above market levels if market prices are low. To the extent that this provides an alternative to whatever market power is now in the hands of the traders and millers, and to the extent that this can be done without pulling grain north across the border from India, this may be an easy way to provide benefits to producers. If only a small amount of grain must be purchased from farmers to force traders in major market areas to raise their own prices, the cost of this policy would be low. This policy could be especially beneficial to farmers immediately following the harvest when market prices are depressed.

Fertilizer Policies

Current fertilizer price policy--which includes both import price and transport cost subsidies--is designed to address both production efficiency and distribution equity goals. The low price, achieved through the import price subsidy, provides an incentive for farmers to use more fertilizer, thus increasing crop production. This policy is efficient if the total real cost of the additional fertilizer used is less than the value of the increased output. The uniform national price, achieved through the transport cost subsidy, is an attempt to provide benefits to hill farmers who are relatively disadvantaged and, perhaps more importantly, is a recognition of the political power of Kathmandu farmers. This policy would be equitable if hill farmers actually received benefits comparable to farmers in other areas. However, people who purchase fertilizer in Kathmandu are the main beneficiaries of the uniform national price policy as now implemented. Hill farmers benefit little because little fertilizer is transported to them.

Any change from the current policy has both efficiency and equity implications. Removing the transport cost subsidy would force hill farmers to take real transport costs into their decisions about fertilizer use. However, if this were combined with increased availability of fertilizer, actual use might not decline. Maintaining the fertilizer transport subsidy in the hills may have environmental benefits if it encourages intensive (and discourages extensive) cultivation. However, if the subsidy leads to increases in both cropping intensity and land under cultivation, it may entail environmental costs rather than benefits.

Reducing the import price or transport cost subsidy would save money for AIC and HMG, and AIC could import more fertilizer. Currently the more fertilizer AIC sells, the more money it loses, so there is little incentive to increase imports. Lack of timely availability is much more often a reason for not using fertilizer than high price, so reducing the subsidy may not decrease fertilizer use, especially if this is accompanied by increased fertilizer availability when farmers need it. Chemical fertilizers are still new for most Nepalese farmers, and as more farmers learn about the economic advantages of using fertilizer even at non-subsidized prices, demand will continue to increase.

For political reasons, it may be difficult to eliminate the transport subsidy. If this subsidy is retained, it should be recognized as an investment in transport services like building a road, and should be phased out as better transport becomes available. If this transport subsidy is maintained for the purpose of benefitting farmers in the hills and mountains, the government should allocate funds for transport consistent with fertilizer demand in those areas.

The import price subsidy should gradually be reduced. The price of fertilizer in Nepal should be kept a little above the price in India. A policy which maintains the Nepal price at least ten percent above the Indian price should discourage the informal export of fertilizer from the Tarai to the bordering states of India. A policy which allows for quick responses to changes in Indian prices is needed.

Politically, such a change in policy may be difficult to implement. The fertilizer price is a Cabinet-level decision made only after a

recommendation by the General Manager of the Agricultural Inputs Corporation, approval by the AIC's Board of Directors, and subsequent approval by the Ministry of Agriculture. This can be a long, slow process, which in the past has led to temporary suspension of operations by fertilizer sales points in the Tarai following significant price changes in India. An improvement of this decision process is needed, but the revision suggested above would be an explicit acknowledgment of India's economic dominance, and this may be politically impossible to implement.

The above discussion presumes that the government of Nepal, through the Agricultural Inputs Corporation, will continue to be the main source of fertilizer supply for Nepalese farmers. There are other possible sources of fertilizer: for example, the private sector could be encouraged to import and distribute fertilizer, and the government's role could be substantially reduced, as in Bangladesh (2). If the fertilizer subsidy were eliminated, the private sector should be eager to sell fertilizer in those areas where a profit can be made--that is, in the Tarai (where transport costs are low) and the Kathmandu Valley (where demand is high). The private sector might not be willing to supply fertilizer to the hills where demand is still low and transport costs are high. For equity reasons, the government could either continue to supply fertilizer to the hills, or pay the private sector to transport fertilizer to specified points in the hills.

The arguments for a significantly decreased government role in fertilizer procurement and distribution are conceptually powerful, but political considerations indicate that the private sector's formal role will remain limited to dealerships for AIC-procured fertilizer in the near future. Thus, it is likely that the government, through the Agricultural Inputs Corporation, will continue to be the main source of fertilizer supply for most of Nepal's farmers for the near future.

One useful role for the Nepalese government would be to negotiate with the Indian government to eliminate the ban on fertilizer exports from India to Nepal. Nepal could then take advantage of relative fluctuations in Indian and world fertilizer prices, importing from India when prices are lower there. Many problems now associated with obtaining fertilizer from overseas sources and shipping it through Calcutta would also be eliminated if fertilizer were purchased directly from India.

A reduction in the fertilizer subsidy will benefit HMG and AIC because their costs will be less. Farmers--for whom the value of increased output exceeds the cost of increased fertilizer use--will benefit if AIC's decreased losses lead to an improvement in timely fertilizer availability. Equity goals with respect to farmers in the mountains and hills can be achieved by maintaining the transport subsidy (that is, selling fertilizer at a uniform national price), and by using the gains from eliminating the fertilizer subsidy for other purposes--for example, increased crop production research focusing on rainfed areas could lead to improved technology choices for hill farmers, and improved transportation networks could both reduce the cost of fertilizer and increase access to markets generally.

Summing Up

Nepal has three explicit food price policies: food subsidies for consumers living in food-deficit areas, product price interventions for farmers producing rice and wheat; and input price interventions for farmers using fertilizer. None of these policies has achieved its officially stated objective. Food subsidies, officially intended for consumers living in remote areas, have primarily benefitted Kathmandu residents; output support prices, formally designed to encourage increased foodgrain production, have been below market prices and thus not provided any incentive to farmers; and subsidized fertilizer, intended to increase crop output, has been provided in such small quantities that there has been little overall impact on food production.

Moreover, these policies have been implemented more or less independently of each other. One HMG report (3) concludes that:

NFC has still been mostly concerned in the crisis management year after year such that 'food policy' has been implemented on a piecemeal basis. As a result integration of food policy with 'price policy' and even 'agricultural policy' has lacked. Thus it has not been an instrument to the agricultural development of the country.

Coordination of policies related to subsidized food distribution, output price supports, input price subsidies, and overall foodgrain production strategy, while desirable, is likely to continue to prove difficult.

The scope for increasing the impact of any of these policies is limited. Financial constraints limit the ability of the government to move substantial quantities of food into the hills and mountains, and political considerations insure that Kathmandu Valley residents are well-fed; even if financial constraints did not limit the government's ability to support output or subsidize input prices, the long open border with India effectively prevents Nepal from implementing an independent price policy for either foodgrain or fertilizer.

In some respects "the Tarai is too open and the hills are too closed" for Nepal to implement effective price policies (4). India's market dominates the Tarai, and transport costs dominate the hills and mountains. Thus perhaps "price" policy should focus on nontradable inputs: improving transportation and irrigation infrastructure in the hills, and focusing research efforts on rainfed upland crops could have high payoffs (5). Improving local food productive capacity in the hills and mountains is a much better strategy than making investments in transportation and management related to food distribution.

The main issue facing the Nepalese government is thus to recognize the constraints on food price policies, and to avoid policies which cannot be implemented in the face of these constraints. Food subsidies are expensive in a country with high transport costs, and cannot be maintained indefinitely even for Kathmandu residents. Output support prices and fertilizer subsidies can be maintained only within the range determined by market prices and transport costs from India. Political considerations may tempt government officials to ignore these constraints for short-term gains, but economic factors are almost certain to dominate in the long run.

Notes to Chapter IV

- (1) The 1984 FAO Food Security Review Mission recommended that NFC enter the market as a purchaser only when private traders offer market prices below the minimum support price, and enter the Kathmandu market as a seller only when consumer prices rise too high. Scherer (1986) provides comprehensive suggestions for improving the overall operations of NFC.
- (2) IFDC, September 1982.
- (3) HMG, June 1984, p.1.
- (4) Robert W. Herdt, Scientific Advisor, CGIAR, World Bank, provided this insight at a workshop held at Stanford University, Palo Alto, California in March 1986.
- (5) Timmer (1985, pp.88-89) states:

Still, it is much less difficult for countries to influence domestic prices for commodities that are actively traded across the border than for those commodities whose price formation is entirely determined by domestic supply and demand conditions . . . In such circumstances, prices must be influenced by moving the supply or demand schedules, or both, rather than by altering quantities through imports or exports, unless very substantial subsidies are paid. Agricultural research, investments in irrigation and infrastructure, and extension programs can all shift supply schedules. Income growth, family planning programs, and induced changes in tastes can shift demand curves. These long-run strategies, however, are normally considered not as part of price policy but rather as components of overall development strategy. That they clearly influence prices serves as a reminder that the boundaries of price policy and of analysis that seeks to understand its impact are fuzzy indeed.

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