



**AN ASSESSMENT OF FOOD AID
AS A DEVELOPMENT RESOURCE
IN NEPAL**

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A Report Submitted to
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EXECUTIVE SUMMARY

The objective of this study was to assess food aid as a development resource under the current policies, and determine the implications of food aid in terms of the Government of Nepal's (HMG) national development strategy, including the potential impact of food aid and its cost effectiveness. The only continuing food aid activities in Nepal are carried out by the World Food Programme (WFP) but the terms of reference for the study did not include an evaluation of those activities.

Current development doctrine regards food aid as a potentially valuable development resource when it is additional to assistance that would otherwise be available to the recipient country and when it can be effectively utilized to achieve positive socioeconomic benefits and avoid negative disincentive effects at the macroeconomic and agricultural sector levels.

Nepal fulfills the essential pre-conditions for food aid assistance, especially in the form of food-for-work projects. Seasonal underemployment of labor is prevalent in the remote hills and mountains, which are not well integrated into the national economy and which suffer chronic food deficits. Food scarcity is manifested in serious health and nutrition problems especially in those large areas of the country where there is an exceptional lack of transportation infrastructure.

The factors identified above exist in a policy context that does not adequately provide the incentives and security necessary for producers to adopt new technology and utilize purchased inputs. In spite of growing HMG and donor support for agricultural infrastructure and services, growth in food production is lagging behind population growth and food needs in the country. Possible policy reforms have been identified but have not yet been translated into implementable approaches within a coherent long-term strategy for regional, sectoral, and national development.

Despite the promise of food aid for Nepal, the report recommends against a bilateral PL 480 program. This recommendation is based on the difficulties of designing, managing, and executing food aid activities, the financial burdens that would be imposed on HMG, and the potential complementarity between USAID capital and technical assistance and WFP food resources.

Based on analysis in the report, specific recommendations are made to improve the effectiveness of food aid with respect to:

1. choice of location for food-for-work projects
2. integration of food aid with other foreign economic assistance
3. partial payment of wages in cash
4. subsidized sale of food to workers and programming of funds so generated
5. relation of food-for-work wages to local wage levels
6. incorporation of WFP food resources into USAID area development activities
7. selection of commodities for food aid programs
8. local procurement of food for food aid projects.

In carrying out the study, serious implications of existing HMG food pricing and subsidized distribution policies were encountered. Despite good intentions, government policies do not assure producers of remunerative and secure prices. AS a result, diffusion of technology and use of inputs are discouraged. Instability in export markets is intensified. Subsidy costs are high but neither subsidized inputs nor food gets to those areas and population groups most in need.

Through its policy dialogue and technical assistance, USAID can help HMG design and implement improved policies and programs within a coherent long-term strategy framework. The success of USAID's own portfolio of area development, technology generation, and irrigation projects will thereby be enhanced.

INTRODUCTION

Nepal is one of the poorest countries in the world. The current per capita income of its approximately 16 million people is around U.S. \$170. Other disconcerting facts compound this picture of widespread poverty. First, per capita GDP grew at an annual rate of only 0.2 percent between 1960 and 1979. Second, Nepal's population has been estimated to be growing at a rate of 2.66 percent annually during the past decade. Third, by all indications, there is high inequality in the distribution of income. Recent data from the National Planning Commission suggest that the gini coefficient is as high as 0.6 for rural areas and 0.55 for urban areas.

These growth/poverty characteristics are manifested in a number of social indicators such as the low rate of adult literacy, estimated at 20 percent, a life expectancy at birth of only 44 years, and high rates of infant mortality and protein-energy malnutrition. An anthropometric survey¹ performed in 1975 found that in rural Nepal 6.6 percent of the population was classified as wasted based on a cut-off point of not achieving 80% of the medium weight-for-height of the reference population and 52 percent of the rural children were stunted according to the criteria of achieving less than 90% of the height-for-age median value of the reference population. Using the Gomez classification based on weight-for-age data, only 7.3 percent of rural population were normally nourished while 5 percent were third degree malnourished and 45 percent second degree malnourished.

Efforts to resolve this disturbing picture of the Nepal economy and the health and welfare of its people inevitably involve improving the poor performance of the agricultural sector. Over 90 percent of the economically active population earn their livelihood in agricultural occupations but they are producing less than two-thirds of the GDP. The task of accelerating agricultural development, however, is hampered by the narrow resource base available to this land-locked country.

Although only approximately one-fifth of the total rural area is devoted to crop production, Nepal is quickly approaching its cultivation frontier. Loss of soil fertility and soil erosion are widespread. As a

¹ Nepal Nutrition Status Survey, His Majesty's Government of Nepal, U.S. Department of Health, Education and Welfare, and U.S. Agency for International Development, 1975.

result of the limited and declining resource base in the hills and mountains, temporary and permanent migration to the third geographic area of Nepal, the Terai, is heavy. The Terai, referred to as the grainary of Nepal, covers less than one quarter of the country. Its southern border is common with India. This poses some special problems for the process of agricultural development in the country. The Terai, however, has a per capita income close to three times greater than that in the hills and mountains. While it contains whatever cultivatable land in Nepal that is not yet in production, nevertheless, its ecology, too, is being threatened by both uncontrolled migration from the hills from its southern neighbor, India.

With this brief overview, the remainder of this report is designed to assess the potential impact of food aid as a development resource in Nepal. Specific concern revolves around determining the potential for food aid in promoting agricultural development, and whether, how, and under what circumstances, the concept and utilization of food aid can support movement toward the HMG's adoption of a sound and progressive agricultural development strategy. This task involved examining indirectly the activities of the only food aid program operating in Nepal, under the auspices of the World Food Program (WFP). However, the terms of reference for the study did not include evaluation of WFP activities. (This is the charge of missions sent from WFP headquarters.) Therefore, references to existing WFP projects in the report are strictly for illustrative purpose to further emphasize more general principles affecting food aid.

Three sections follow. The next section reviews trends in food production and food availability in Nepal. Identification of the extent of food deficits, coupled with an examination of HMG policies with regard to food distribution, price supports, food security, and trade policy, are all discussed as important background information for considering the role of food aid. This is followed by a discussion of a variety of issues with regard to food aid. In particular, constraints and potentials for food-for-work as a tool to increase agricultural production are discussed. The last section contains specific conclusions and recommendations.

FOOD PRODUCTION, REQUIREMENTS, AND POLICIES

OVERALL NATIONAL DEVELOPMENT AND FOOD STRATEGY

Development strategies and programs in Nepal have recognized the importance of agriculture for overall economic development in the country. The share of agriculture in total GDP was 54 percent in 1983/84 (current prices). (Measured in 1970/71 prices, the agricultural share was 60 percent.) However, more than 90 percent of the economically active population is involved in agriculture. Successive national development plans have allocated increasing amounts of public resources to agricultural development. Substantial investments have been made to increase irrigation, expand the supply of chemical fertilizer and improved seeds, improve the range and quality of agricultural research, extend the coverage of extension, and augment the availability of agricultural credit. In spite of these efforts, the trend rate of growth in agricultural production has been low, which has in turn retarded the country's overall rate of economic growth.

The need to develop an integrated national market based on regional production patterns following comparative advantage and exchange between the Mountain/Hills Region and the Terai has also been addressed in the national plans. In fact, a key strategy in HMG's fifth five-year plan (1975-80) was to promote growth based on regional comparative advantage. On the basis of agro-climatic suitability, the Terai area was to specialize in foodgrain and oilseed production while the hills and mountains would emphasize long-term specialization in horticulture, livestock, and dairy production.

This approach was abruptly abandoned in the fifth five-year plan (1980-85) which emphasized foodgrain production in the hills and mountains as well as in the Terai. The main factor behind this shift was the deteriorating food supply in the Hill and Mountain Regions and the need to alleviate the food deficits in those regions. The guidelines for the seventh plan (1985-90) give top priority to making the Hill and Mountain Regions self-sufficient within 10 years.² Thus, regional self-sufficiency remains a crucial element of national food policy.

² National Planning Commission, HMG. Basic Principles of the Seventh Plan (1985-1990). Kathmandu, March 1984, p. 31.

As a long-term strategy, the earlier approach based on comparative advantage has obvious strengths. However, its success depends importantly on identifying the production potentials in the hills that have a comparative advantage and providing the required physical and commercial infrastructure for reciprocal interregional trade.

The binding constraint at the current time is transportation and other infrastructure. Its absence limits trade both by making movement of food-grain from the Terai to the hills very costly and products from the hills generally uncompetitive in national and export markets. Transportation costs thus create a formidable barrier to the interregional movement of goods, including food.

With this point in mind we next examine food production and consumption trends to identify food deficits and alternative approaches for improving food production and distribution in the country.

FOOD PRODUCTION REGIONS

From a food production perspective, the country can be divided into three distinct topographical or ecological regions:

- the northern Himalayan region (Mountains)
- the middle hills (Hills)
- the southern plains (Terai)

The high mountains cover over 34 percent of the country's land area. Altitude ranges from 3,000 m to over 8,000 m. Animal production is the main activity of the people of this region although agriculture is practiced on the limited arable land. The Hills Region includes 43 percent of the country's total land area. Altitude varies from 3,000 m to 6,000 m. The region includes high ridges, steep slopes, and numerous valleys. Food is produced on terraced slopes and in the valleys. The Terai extends in a narrow strip from east to west along the southern border of the country. It includes about 23 percent of the total area. It has emerged as the major food-producing region of the country.

The 1981 census estimated the total population of the country to be 15.02 million. The annual rate of population growth during the 1971-81 intercensal decade was 2.66 percent. The 1984 population is estimated to exceed 16 million. Distribution of population among the three ecological

regions is uneven. In 1981, the Mountain Region had 8.6 percent, the Hills 47.7 percent, and the Terai 43.7 percent of the total population. The annual rate of growth of population in the Terai, however, is much higher than those of the other two regions: 4.2 percent in the Terai compared to 1.7 percent in the Hills and 1.3 percent in the Mountains.

Food production patterns vary widely in the three regions. The economy of the Mountains combines agriculture with pastoralism and trade. The main crops are barley, buckwheat, potato, and radish. Large numbers of sheep, goats, and yak are pastured, moving from the Tibetan border in the summer to the Hills in winter. Both the movement of livestock across the border and trade with Tibet have declined since the incorporation of Tibet into the PRC. Salt from India replacing Tibetan salt and the lack of surplus foods for barter have both reduced trade across the border, exposing mountain communities to increasing economic hardship.

In the Hills, the principal food crops are maize, paddy, wheat, and millet. Production in terraced slopes is maize-based while in the valleys and levelled terraces it is primarily paddy-based. In spite of the intensity and diversity of hill agriculture, the region's growing population has created a precarious food-supply situation. Much of the region suffers chronic food shortages. As roads and air transportation have expanded, the hill economy has experienced increasing seasonal migration of labor for potorage, work in the Terai and India, and mercenary service.

Control of malaria in the Terai opened up the region's rich agricultural resources. It now grows more than 70 percent of the country's foodgrains and most of the cash crops such as jute, sugarcane, oilseeds, and tobacco. Most of the large irrigation projects are located there.

As noted earlier, differential population growth rates have resulted in a significant change in the distribution of population during the last three decades. This has led to a population density in the Terai that exceeds that of the other two regions. During 1952-81, the population density of the country increased from 60 to 100 persons per km². In 1981, however, average density in the mountains and hills was 62 compared to 232 in the Terai. Much of the population increase in the Terai has been the result of migration from the other regions. There are also reports of substantial migration from India in some areas of Terai.

In relation to cultivated land, however, effective population density is significantly higher in the non-Terai regions. Data on cultivated land and population by region for 1971--the most recent available--are given in Table 1. Cultivated land per-capita and per-household was about three times as large in the Terai as in the other two regions. The Mountains and Hills contained 62 percent of the population but supported it on only 35 percent of the cultivated land.

FOOD PRODUCTION TRENDS AND REQUIREMENTS

Food production in Nepal has not kept up with population growth. Moreover, the number of food deficit districts in the country has grown year by year.

The long-term balance between population and food production over the last two decades is presented in Table 2. In the decade ending in the mid-70s, production generally kept up with the growing population and foodgrain requirements. A comfortable positive balance existed each year, much of which was exported to augment scarce foreign exchange earnings. After 1976, a marked deterioration has taken place in the annual balances. Even in good crops years foodgrain balances have been lower recently than they were previously. In bad crops years negative national food balances have been experienced.

The main foodgrain crops are paddy, maize, and wheat. Together these three crops account for over 85 percent of the cropped area each year, paddy alone accounting for half of the area. In terms of output these three foodgrains constitute over 95 percent of cereal grain output with millet and barley accounting for the remainder. Other important crops are potato, oilseeds, sugarcane, jute, and tobacco.

A clearer picture of trends is given in Table 3 where average area, production, and yields of cereal crops are compared for 1971-74 and 1981-84. For paddy, even though average annual production increased, yields decreased. Production increased only because the expansion in area was large enough to offset the decline in yields. Wheat is the only cereal crop for which the yield trend has been positive. This, coupled with a strong expansion in area, has led to a major increase in wheat production.

Table 1

Cultivated Land and Population, 1971

Regions	Cultivated Land ('000) (%)	Population ('000) (%)	Households ('000)	Per-Capita Cultivated Land (ha)	Per-Household Cultivated Land (ha)
Mountains	97 (4.86)	1,139 (9.86)	205	0.085	0.473
Hill	606 (30.36)	6,071 (52.53)	1,091	0.100	0.555
Terai	1,293 (64.78)	4,346 (37.61)	794	0.297	1.628
Nepal	1,996 (100)	11,556 (100)	2,090	0.173	0.955

Source: Dhital, B.P. (1975), "Population Growth and Agriculture" in Population and Development, Upadhyaya, D.C. and Abueva, J.V., eds., (Kathmandu), pp. 97-114. Based on 1971 Agricultural Census data.

Table 2

Foodgrain Production, Requirements, Exports, and Imports

(Unit: '000 mt)

Years	Popula- tion	Foodgrain Production (Edible Form)	Foodgrain Require- ments	Foodgrain Balance	Foodgrain Exports	Foodgrain Imports
1964/65	10,218	2,020	1,522	498	-	-
1965/66	10,421	2,090	1,553	537	-	-
1966/67	10,646	1,968	1,586	382	-	-
1967/68	10,866	1,984	1,619	365	-	-
1968/69	11,091	2,061	1,653	408	-	-
1969/70	11,321	2,149	1,687	462	-	-
1970/71	11,555	2,157	1,722	435	-	-
1971/72	11,806	2,150	1,759	391	-	-
1972/73	11,061	2,095	1,797	298	-	-
1973/74	12,321	2,305	1,836	469	-	-
1974/75	12,587	2,410	1,811	539	66	8
1975/76	12,856	2,470	1,913	557	158	1.5
1976/77	13,136	2,352	2,001	351	129	1
1977/78	13,422	2,246	1,935	311	63	5
1978/79	13,713	2,302	1,991	312	68	7
1979/80	14,010	2,000	2,034	- 34	12	38
1980/81	14,331	2,409	2,061	348	45	55
1981/82	15,023	2,509	2,248	261	62	9
1982/83	15,422	2,197	2,307	-110	3	73
1983/84	15,834	2,676	2,369	307	16	-

Source: Food and Agriculture Marketing Services Department and Nepal Rastra Bank, HMG

Note: Cereals Include, Rice, Wheat, Maize, Millet and Barley only. Exports are officially recorded and do not include unrecorded movements of rice across the border.

Table 3

Annual Production and Yield of Cereal Crops, 1971-74 and 1981-84 Averages

Crops	Annual Average for 1971-74			Annual Average for 1981-84			Percentage Change 1971-74 to 1981-84		
	Area (^{'000} ha)	Produc- tion (^{'000} mt)	Yields (mt/ha)	Area (^{'000})	Produc- tion (^{'000} mt)	Yields (mt/ha)	Area	Produc- tion	Yields (mt/ha)
Paddy	1,189	2,256	1.89	1,299	2,378	1.83	+ 9.3	+ 5.4	- 3.2
Maize	446	798	1.79	497	744	1.50	+11.4	- 6.8	-16.2
Wheat	258	281	1.00	452	605	1.34	+75.2	+115.5	+24.1
Millet	120	135	1.13	125	119	0.96	+ 4.1	- 11.9	-15.0
Barley	27	25	0.92	21	22	0.87	-21.4	- 12.0	- 5.4

Source: Food and Agricultural Marketing Services Department, HMG.

Both yields and production have declined significantly in maize and millet, which are grown mostly in the Hills and Mountains.

In contrast, average yields and production of other crops have tended to increase (Table 4). Both potatoes and oilseeds showed positive changes in yields and production. The exception is jute, for which a decline in area outweighed increasing yields resulting in a fall in production. Jute (and jute products) are a principal export commodity. Unfavorable international prices have apparently been the main cause of the shift in area from jute to other crops.

Comparable data were obtained by ecological zone for paddy, the most widely grown foodgrain (Table 5). Yield trends were strongly negative in the Mountain and Hills but only slightly so for the Terai. Most of the area expansion occurred in the Hills and Mountains; the growth in area of paddy in the Terai was extremely limited. (This fact seems not to be widely recognized.)

Production of foodgrains also fluctuates a good deal from year to year. As an example, Figure 1 shows an index of annual production of paddy with 1971-84 average set equal to 100. The results suggest that production variations may be greater in recent years than earlier in the decade. Maize has equal or possibly greater fluctuations in production. Wheat production has been somewhat more stable around its rising production trend.

Weather is obviously a major factor causing production fluctuations. It is also possible that fluctuations in production has increased under more intensive production using improved seeds and chemical fertilizer. A third factor is the role of prices affecting the choices by farmers of which crops to grow. Wheat is believed to be the most responsive crops to prices. The large wheat crops in 1983/84 caused a sharp decline in farm-gate prices. This has led to a widespread expectation that wheat area will decrease in the current year in response to last year's depressed prices.

The most disconcerting aspect of these trends is the stagnant or falling yields of the main foodgrain commodities. Rice and wheat yields were about as high in the 1960s as they are now. Wheat is the only major cereal to show a positive trend in yields, and this is accounted for in large part by the fact that the Terai wheat yields were below the national average in the late 60s. As productivity of land in the Terai caught up

Table 4

Average Annual Production and Yields of Major Noncereal Crops
1971-74 and 1981-84

(Production in 000 tons, yields in mt/ha)

Crops	1971-74 average		1981-84 average		Percent Change 1971-74 to 1981-84	
	Production	Yield	Production	Yield	Production	Yield
Sugarcane	242	16.52	600	23.79	+147.9	+44.0
Oilseeds	57	0.52	74	0.67	+ 29.8	+28.8
Potato	283	5.61	356	6.29	+ 25.8	+12.1
Jute	51	1.08	36	1.18	- 30.0	+ 9.3
Tobacco	6	0.70	6	0.73	0.0	+ 4.3

Source: Food and Agricultural Marketing Services Department, HMG

Table 5

Annual Production and Yields of Paddy
in Different Ecological Zones
1971-74 and 1981-84 Average

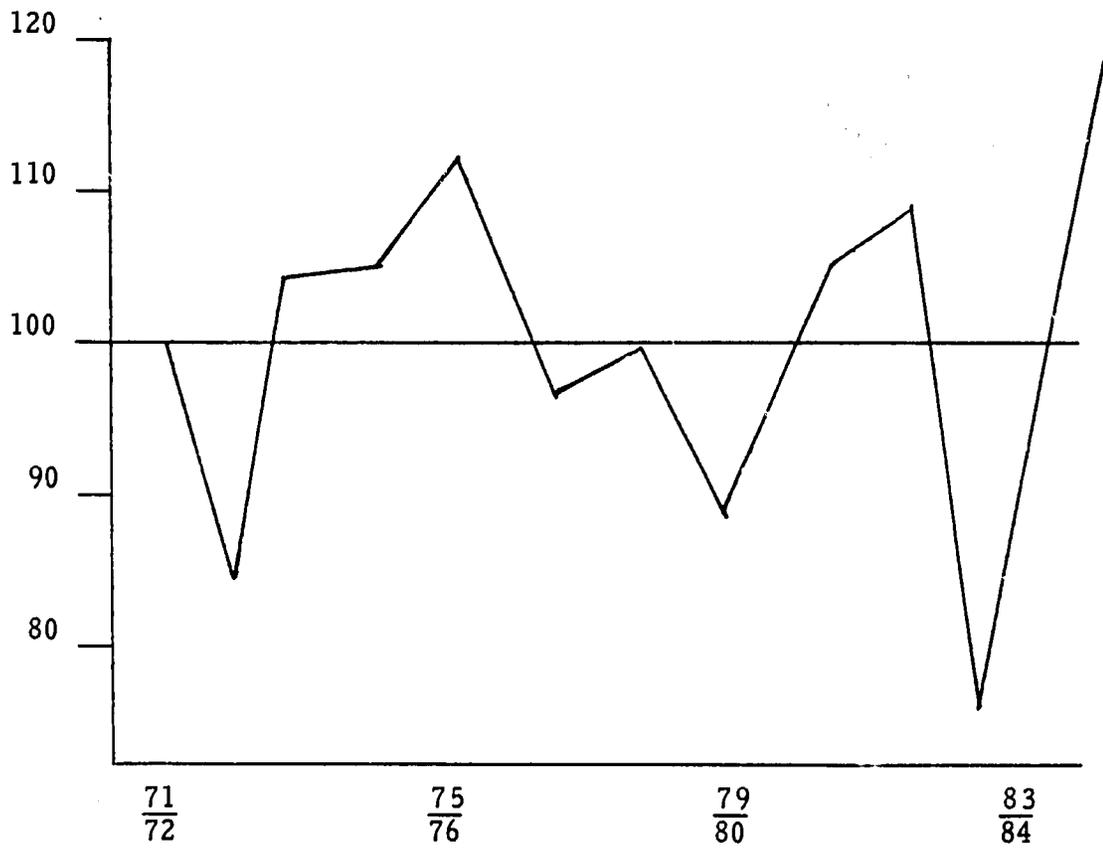
Zone	1971-74 average			1981-84 average			Percent change 1971-74 to 1981-84		
	Area	Produc- tion	Yield	Area	Produc- tion	Yield	Area	Produc- tion	Yield
Mountain	19	44	2.29	25	47	1.86	+31.5	+ 5.9	-18.8
Hills	184	456	2.47	249	529	2.13	+35.3	+16.0	-13.8
Terai	985	1756	1.78	1025	1802	1.76	+ 4.0	+ 2.6	-1.12

Source: Food and Agricultural Marketing Services Department, HMG.

Figure 1

INDEX OF FLUCTUATION IN PRODUCTION OF PADDY

(Average Production During 1971-84 = 100)



with the other regions average wheat yields have risen. The yield stagnation in paddy is especially surprising given the increased use of improved varieties and chemical fertilizers in recent years (Table 6). The situation is made all the more serious by lack of anything but marginal land to bring into production. Expansion of cultivated area can no longer be a major factor in expanding food production. Increases in yields and cropping intensity are the only remaining sources of the production potential needed to meet the country's food requirements in the future.

FOOD BALANCES BY ECOLOGICAL REGIONS

Based on the approach of minimum per-capita requirements, foodgrain balances are calculated annually for each of the three main ecological regions. Results for the last decade are shown in Table 7. Both the Mountains and Hills are consistently deficit, the largest deficits occurring in the more densely populated middle hills. There is an unmistakable tendency for the deficits to grow over the 10-year period. Even in the recent good crop years (1980/81) large deficits existed in the Hills. Nepal is still a food surplus country in the sense that food exports occur (informally if not officially) in all except the worst crop years (e.g. 1982/83). Internal economic demand for food is satisfied in most years by local production. This in no way means that minimum food needs of the poor are being met. This is the main point of these data. All available information points to growing food deficits in the Hills and Mountains, i.e., increasing undernutrition among the poor income groups in those regions.

FOOD AVAILABILITY AND REQUIREMENTS: 1983/84 AND PROJECTIONS

Cereals are the staple foods of Nepal. As shown in the previous section, production growth of cereal grain in the past has not kept pace with consumption needs based on population growth. The margin of national production over consumption requirements has been narrowing, and this trend may worsen in the future. Data for 1983/84 are used below to investigate the extent and distribution of food deficits in the country.

Table 6

Areas Under Improved Varieties of Wheat, Rice and Maize, Nepal
1964/65-1983/84

Year	WHEAT		RICE		MAIZE	
	Total Area (^{'000} ha)	% Under Improved	Total Area (^{'000} ha)	% Under Improved	Total Area (^{'000} ha)	% Under Improved
1964/65	100	--	1101	--	437	--
1965/66	118	3.7	1111	0.6	451	0.1
1966/67	126	9.0	1100	1.2	450	0.3
1967/68	192	14.4	1154	2.3	412	0.8
1968/69	208	26.1	1162	3.7	422	1.6
1969/70	226	33.8	1173	4.3	433	2.8
1970/71	228	43.1	1182	5.7	446	2.6
1971/72	239	48.5	1201	6.8	439	3.1
1972/73	259	65.7	1140	15.1	446	5.4
1973/74	274	75.5	1227	16.7	453	7.1
1974/75	291	84.8	1240	18.0	458	10.4
1975/76	329	71.0	1256	17.2	453	14.6
1976/77	348	73.0	1262	17.5	445	18.8
1977/78	366	78.4	1264	23.0	445	22.2
1978/79	356	85.4	1263	24.7	454	24.0
1979/80	367	85.7	1254	25.1	432	28.0
1980/81	392	83.5	1276	25.5	457	35.0
1981/82	400	100.0	1279	34.1	457	29.1
1982/83	483	84.0	1264	36.3	510	28.8
1983/84	473	92.1	1334	35.9	504	38.4

Source: Food and Agricultural Marketing Services Department, HMG

* Preliminary estimates

Table 7

Foodgrain Production, Requirements, and Balances by
Ecological Region

(Unit: '000 mt)

Year	Food Production			Food Requirements			Food Balances (+)(-)		
	Mountain	Hill	Terai	Mountain	Hill	Terai	Mountain	Hill	Terai
1974/75	131	870	1410	146	924	801	-15	- 54	+609
1975/76	131	872	1468	150	944	819	-19	- 72	+649
1976/77	128	881	1343	158	922	850	-31	-111	+493
1977/78	121	816	1310	140	955	841	-19	-139	+469
1978/79	122	848	1333	142	982	867	-20	-134	+466
1979/80	106	709	1186	144	1002	889	-38	-294	+297
1980/81	115	821	1473	147	1022	891	-32	-201	+582
1981/82	114	914	1480	160	1001	1087	-46	- 86	+393
1982/83	105	861	1230	165	1027	1116	-60	-166	+114
1983/84	109	909	1724	184	1121	1194	-75	-212	+530

Source: Food and Agricultural Marketing Services Department, HMG.

In this analysis average daily calorie requirements are taken to be 2238, 2342, and 2109 calories per person in the Mountain, Hill, and Terai Regions, respectively. Cereal plus potato consumption was assumed to provide 80 percent of total calorie requirements. Net available quantities (after losses and seed) of cereals and potato were converted to available calories and compared to calorie requirements based on population. This comparison provided an estimate of food surplus or deficit in calories, which were then converted to quantities of foodgrains.

The 1983/84 data show that on this basis 51 districts out of 75 total are food deficit districts (Table 8). The total deficit in these districts amounted to 710,500 metric tons of foodgrains. The deficit districts contained slightly more than 50 percent of the population of the country. The other 24 districts, containing slightly less than 50 percent of the population, met or exceeded their food production requirements. Of course, this in no way means that all of the people in the self-sufficient/surplus districts consumed their minimum daily calorie requirements, but only that production of food in each of those districts was at least equal to total minimum calorie requirements for the district.

At the bottom of Table 8 these data for the 51 deficit districts are summarized by ecological region. As expected, only a very small deficit existed in the Terai districts included in the deficit group. In terms of population affected and total size, the deficits are concentrated in the Hill Region. However, the size of the deficit relative to the population of the districts is somewhat higher in the Mountain Region.

These same data are presented for all districts in Table 9. As such they are more comparable to the data in Table 2 although the method of computation is different. Considering all districts, both the Mountain and Hill Regions remain deficit but the magnitude of the deficits are marginally reduced. Overall the Terai shows a strong surplus but smaller in magnitude than the sum of the deficits in the other two regions. As a result, for the country as a whole, food availability was insufficient to meet the estimated requirements for minimum daily calorie consumption by the population. The country suffered an overall deficit of 248,750 metric tons, equal to about 5 percent of total production of foodgrains and potatoes.

Table 8

Food Production and Requirements in Deficit Districts

1	2	3	4	5	6	7	8	9	10	11	12
Dev. Region/District	Production Cereals MT	Production Potato MT	Net Avail. Cereals MT	Net Avail. Potato MT	Food Avail. 10 ⁶ Cal.	Population	Nutrient Req. C/P/D	Food Req. 10 ⁶ Cal.	Cereal/Pot. Req. (80%)	Cal. Deficit 10 ⁶ Cal.	Foodgrain Deficit
1. EASTERN DEVELOPMENT REGION											
1. Taplejung	16180	8220	12759	5240	48471	122769	2238	100286	80229	31758	9205
2. Sankhuwasabha	31640	12000	21563	7650	81183	131623	2238	107519	86015	4832	1401
3. Solukhumbu	6570	9700	5241	6273	23898	90126	2238	73621	58897	34999	10145
4. Panchthar	32260	12000	22582	6885	83728	155380	2342	132834	106259	22530	6530
5. Ilam	39800	16250	27092	10519	102983	185307	2342	158406	126725	23787	6895
6. Bhojpur	29950	7830	21899	4973	79226	195784	2342	167362	133890	54164	15700
7. Khotang	10910	4500	8596	2754	31959	215172	2342	183936	147149	115190	33388
8. Okhaldhunga	18950	11520	14730	7436	57372	140573	2342	120166	96133	38762	11235
9. Udayapur	44420	1980	29328	1262	101749	170559	2432	145799	116639	14891	4316
TOTAL	230680	84000	163790	52992	589559	1407293		1189919	951936	340913	98815

2.

1. CENTRAL DEVELOPMENT REGION	3	4	5	6	7	8	9	10	11	12	
. Dolakha	11830	6400	8827	3978	33971	154090	2238	125871	100697	66726	19340
. Sindhupalchok	25880	18900	19154	12393	77316	238076	2238	194477	155582	78266	22686
. Rasuwa	2140	4500	1692	3060	8707	30996	2238	25319	20256	11549	3348
. Ramechhap	16180	9350	12075	5852	46899	162286	2342	138727	110981	64082	18574
. Sindhuli	37740	6900	26612	4360	95219	191577	2342	163765	131012	35794	10375
. Kavre	64440	14720	46627	9853	169154	321235	2342	274617	218683	50540	14649
. Bhaktapur	40490	3870	27163	2632	95661	165544	2342	144076	115261	19600	5681
. Lalitpur	36320	2240	23742	1469	82775	193976	2342	165816	132653	49878	14457
. Kathmandu	87990	7380	58223	5018	204505	440330	2342	376407	301126	96621	28006
. Nuwakot	62990	3420	39355	2180	137096	208699	2342	172402	142722	5626	1631
. Dhading	38330	2220	25591	1415	88726	249968	2342	213680	170944	82218	23831
2. Sarlahi	125810	5320	75373	3488	262376	426426	2109	328256	262605	229	66
TOTAL	550140	85220	364434	55698	1302405	2786221		2329413	1863532	561129	162644

3.

111. WESTERN DEVELOPMENT REGION	3	4	5	6	7	8	9	10	11	12	
1. Gorkha	22370	610	15753	- 321	53412	241016	2342	206028	164822	111411	32293
2. Lamjung	31530	644	22142	- 211	75377	158828	2342	135771	108616	33239	9634
3. Tanahu	50740	90	35360	- 46	120597	236631	2342	202280	161824	41226	11949
4. Kaski	64110	6480	40409	4131	141752	234747	2342	200669	160535	18783	5444
5. Parbat	13790	2360	10366	1408	36566	131370	2342	112299	89839	53274	15442
6. Syangja	38640	2590	25635	1637	88832	276684	2342	236518	189214	100382	29096
7. Palpa	30250	1400	19706	918	68315	222367	2342	190082	152066	83750	24275
8. Myagdi	13310	1650	9979	1010	35066	98989	2342	84619	67695	32629	9458
9. Baglung	22940	4600	15919	2930	57321	223309	2342	190891	152713	95392	27650
10. Gulmi	22970	1050	17346	643	59809	245117	2342	209533	167626	107817	31251
11. Arghakhachi	18770	540	14754	337	50743	163370	2342	139654	111728	60980	17675
TOTAL	329420	22014	227369	12436	787790	2232428		1908344	1526673	738883	214167

4.

IV. MID-WESTERN DEVELOPMENT REGION	4	5	6	7	8	9	10	11	12		
1. Dolpa	3320	2650	2695	1645	10739	22682	2238	18529	14823	4084	1184
2. Mugú	3000	660	2392	405	8500	47280	2238	38622	30898	22397	6492
3. Humla	2460	2800	1897	1836	8166	19360	2238	15815	12652	4486	1300
4. Jumla	7070	1500	4912	918	17634	70416	2238	57521	46017	28383	8227
5. Kalikot	3970	1460	3220	887	11721	91268	2238	74554	59643	47922	23890
6. Rukum	9420	1350	7436	826	26174	139354	2342	119124	95299	69125	20036
7. Rolpa	9390	2200	7474	1346	26803	170834	2342	146034	116827	90024	26094
8. Pyuthan	27720	1500	20843	956	72108	162339	2342	138772	111017	38910	11278
9. Salyan	30520	4300	22196	2632	78009	154383	2342	131971	105577	27568	7991
10. Jajarkot	13240	2000	9481	1224	33440	102273	2342	87426	69941	36501	10580
11. Dailekh	20210	1400	14417	857	49999	170177	2342	145472	116378	66379	19240
12. Surkhet	42630	1940	30423	1262	105237	181907	2342	155500	124400	19162	5554
TOTAL	172950	23760	127386	14794	448530	1332273		1129340	903472	454941	131666

V. FAR-WESTERN DEVELOPMENT REGION	3	4	5	6	7	8	9	10	11	12	
1. Bajura	6980	1000	4896	612	17278	77634	2238	63417	50734	33455	9697
2. Bajhang	11310	750	7717	459	26769	127331	2238	104013	83210	56441	16360
3. Darchula	10710	1500	8042	918	28325	93587	2238	76448	61159	32834	9517
4. Achham	10990	1350	8133	826	28537	189871	2342	162308	129846	101309	29365
5. Doti	31190	2000	22299	1224	77348	158853	2342	135795	108634	31286	9068
6. Baitadi	14420	1400	10011	857	35017	184005	2342	157293	125835	90818	26324
7. Dadelidhura	21540	1600	15767	1033	54626	93363	2342	79809	63848	9221	2673
TOTAL	107140	9600	76865	5929	267900	924644		779083	623266	355364	103004
NEPAL TOTAL	1390330	224594	959844	141849	3396184	8682859		7336099	5868879	2541230	710495
Ecological Region											
1. Mountain	143060	62040	105007	46274	402578	1317238	2238	1076012	929944	458132	132792
2. Hill	1121460	157234	779464	92087	2731230	6939195	2342	5931831	4676230	1992869	577643
3. Terai	125810	5320	75373	3488	262376	426426	2109	328256	262605	229	66
NEPAL TOTAL	1390330	224594	959844	141849	3396184	8682859		7336099	5868879	2451230	710501

Table 9

FOOD AVAILABILITY AND REQUIREMENTS, 1983/84

REGION	PROD. 5 POTATO	PROD. POTATO	NET AVAIL. 5 CEREALS	NET AVAIL. POTATO	FOOD AVAIL. 10 ⁶ CAL	POPULA- TION	NUTRITION REQ.C/P/D	FOOD REQ. 10 ⁶ CAL	CEREAL/POT. REQ. (80%)	SUR/DEF 10 ⁶ CAL	FOODGRAIN SUR/DEF MT.
MOUNTAIN	148030	77830	109149	50160	420463	1337687	2238	1092716	874175	- 453710	-131510
HILL	1289430	178444	900598	112266	3186002	7427260	2342	6349044	5079234	-1893230	-548762
TERAI	2851510	104520	1690400	68293	5875476	7123293	2109	5483405	4386723	+1488750	+431522
NEPAL	4288970	360794	2700147	230719	9481941	15888240	2229	12925165	10340132	- 858190	-248750

Source: Division of Agricultural Statistics (FAMSD) Date: 25/11/84.

PROJECTING FUTURE SUPPLY/DEMAND RELATIONSHIPS

1. Production Trends

Trend equations were fitted to historical data by cereal crops for the Mountain, Hill, and Terai sub-zones in each of the 5 development regions. For each of the 15 sub-zones, a linear, log-linear, or semi-log equation was selected based on the goodness of fit. These equations were used to project production in 1989/90 and 1994/95. Total projected production by crops is given in Table 10. Projected production of the cereal grains were converted into edible basis by deducting quantities required for seed, feed, and post-harvest and milling losses.

2. Future Cereal Grains Requirements

In order to plan for future food grain supplies, estimates of future demand requirements are also necessary. It is almost impossible to predict the exact demand in future, since it involves several factors such as growth in income, employment opportunities, production of competitive food crops, distribution channels and a number of other relevant variables, about which accurate information are not available. The requirements for such an undertaking are beyond the time and resources available of this food aid study. Moreover, experience suggests that predictions will likely differ greatly from what is actually realized. In spite of this dilemma, the absence of any information on future demand/requirements precludes formulating meaningful plans or programs. Therefore, efforts were made to derive three alternative estimates which reflect different scenarios. This will also allow us to evaluate the implications of different assumptions regarding investment requirements and several other strategies for food production and management. Specifically, the three alternatives are follows:

- (1) Alternative I: Calculation of food grains requirement under this alternative is based on the assumption that per capita consumption of foodgrain is 155 kg per year. This level of per capita consumption has been challenged as being too low for Nepal; although, this has

Table 10

Production Trend Scenario of Cereal Grains in Nepal

Crops	Actual M.T.		Projection M.T.			
	1983/84		1989/90		1994/95	
	Gross	Edible	Gross	Edible	Gross	Edible
Paddy	2,756,980	1,427,446	2,476,572	1,277,479	2,621,244	1,354,544
Maize	761,110	629,229	690,700	565,595	681,600	557,946
Wheat	631,760	505,146	905,010	741,319	1,341,458	1,118,546
Barley	20,160	16,584	26,401	21,961	43,724	37,167
Milletts	114,910	94,234	140,858	115,994	145,069	119,524
Total Cereals	4,284,920	2,627,635	4,239,840	2,722,618	4,833,095	3,187,727

been used in several food balance-sheet calculations.³ Projected total estimated national consumption takes into account only population growths.

- (2) Alternative II: This alternative concentrates on the effective demand for food. Estimates of per capita consumption demand and industrial requirements were adopted from a perspective study completed by the Ministry of Agriculture.⁴ The per capita demand for different cereal food grains was estimated giving consideration to possible growth in income, reduction in regional disparity and substitution for different cereal grains due to increases in income.⁵ In the absence of more refined work in the form of food consumption surveys covering different regions of Nepal, these estimates were used. National level foodgrain requirements based on these estimates can be taken as the ones that materialize in the market if the assumed conditions hold.
- (3) Alternative III: Under this alternative projections of food requirements are based on the biological needs of the Nepalese population. Calories needed vary according to the age, body weight, type of work and climatic conditions. Obviously, such requirements vary from individual to individual and country to country. FAO estimates or Indian norms are often used for Nepal. Certain modifications are often made in the absence of more realistic local standards. Accordingly it was assumed that an average working adult in Nepal requires 2254 calories of energy per day.⁶ An additional 200 calories was allocated for hill areas to allow for climatic and geographic conditions. Of the total calories needed, about 80 percent are supplied from cereal grains. The remaining 20 percent come from other items in the diet. The population of different age groups are converted into standard adult consumption units (ACU).

³ Food and Agricultural Marketing Services Department uses this figure in its calculations.

⁴ "Perspective Food Policies and Long Term Food Production Plan 2036/37 - 2056/57" - Draft Report, Ministry of Agriculture, Ashad 2038.

⁵ For details on methodology see in Proceedings of Seminar on "Nepal's Experience in Hill Agricultural Development", Kathmandu.

⁶ This appears low for working adults.

3. Gaps Between Food Production Trend and Future Requirements

It was possible to compare the production trends with requirements under the different demand alternatives. This provided some insight into the gravity of the food deficit situation, and suggests the extent of the efforts necessary in order to reduce the gap between availability and requirements. A brief summary under the different alternatives is found in the following table. The gap is narrowest if a constant per-capita consumption level is projected. Trend production is sufficient to meet population growth and slightly reduce the deficit. Large deficits are projected under the other two scenarios. If either effective demand based on accelerated income growth and improved income distribution or consumption requirements to fulfill minimally adequate nutrition levels are to be met, production trends must rise dramatically over past levels.

STRATEGIES AND POLICIES FOR IMPROVING FOOD PRODUCTION AND DISTRIBUTION

In light of the above discussion, the importance of increasing food production in Nepal is apparent and urgent. Several units of HMG with assistance from FAO are currently preparing a Comprehensive Master Plan for Improved Food Supply in Nepal. The overall aim of the Master Plan is to formulate a long-range strategy to both increase production of food and achieve more efficient and equitable distribution of food among those most in need. In a recent description, the following major elements of the strategy were identified:⁷

"1. Support for Local Food Production

- (a) Small-scale community-owned and operated irrigation works to be supported by Food-For-Work Programme, along with small-scale terracing improvements and small-scale flood control projects, mainly in hill and mountain regions.
- (b) Price strategies will be developed and implemented for production of cereal grains, potatoes, and livestock

⁷ HMG, Ministry of Finance, "Local Level Aid Coordination Meeting on Agricultural Development," Kathmandu, Sept. 16, 1984, Mimeo., pp. 20-22.

Table 11

Gaps Between Production Trend and Foodgrain
Requirements Under Different Alternatives

	(Edible '000 MT)	
Supply/Demand	1989/90	1994/95
<u>Supply</u>		
1. Trend Production	2723	3188
<u>Requirements</u>		
1. Alternative I	2932	3353
2. Alternative II	3208	3880
3. Alternative III	3304	3772

<u>Surplus (+) Deficit (-)</u>		
1. Trend & Alternative I	-209	-165
2. Trend & Alternative II	-485	-692
3. Trend & Alternative III	-581	-584

products. These may include fixing of a minimum floor price announced before planting season, and providing farmers with sufficient profit above costs of production to encourage use of such inputs as mineral fertilizers and improved seed. This would be accompanied by purchasing interventions by Nepal Food Corporation whenever the farmer's price falls below announced levels. So long as prices are above floor levels NFC would not be purchasing from farmers.

- (c) Farming systems research teams will be deployed to remote areas to do practical, problem-solving, applied trial and error experimentation on local farms.

2. Development of Food Transportation Network

This multipurpose food-for-work effort will serve both as (a) the network of food distribution, connecting storages at various locations throughout the kingdom for a strategic food stock positioning, and it will also serve to (b) provide food directly to those most hungry in food shortage areas where the roads are needed, and (c) to reduce the transport costs of bringing such agricultural inputs as fertilizer and seeds to the same remote areas.

3. A Comprehensive Food Stock Positioning

Large scale food storages are now under construction in cooperation with the World Bank (IDA) at strategic locations in the most productive grain producing areas. This will permit a price incentive and production encouragement policies mentioned in other sections.

In addition, it is planned to construct medium scale food storage facilities to enable strategic positioning of food stocks throughout the kingdom. These will supply those who are able to procure food grains in remote areas, and will also constitute an emergency reserve system to be tapped by the disaster relief agency in locations of unpredicted food shortage.

Also, on-farm, household-level storage will continue to be encouraged through the Ministry of Agriculture's Rural Save-Grain Programme.

4. Strengthening Food System Support Institutions

A series of actions are planned to strengthen the Nepal Food Corporation as a major implementor of HMG Food Strategy, in cooperation with the Agricultural Inputs Corporation and other units of the Ministry of Agriculture concerned with increasing production, and also the Sajha cooperatives that deal directly with farmers.

These include among others, the following, to be time-phased over the next ten years:

- Nepal Food Corporation will implement a price intervention strategy featuring: (1) buying directly from farmers at prices announced prior to planting time, (2) supplying foodgrains in Kathmandu and other key locations only when consumers prices are above a certain predetermined, but not publically announced, level, and (3) fixing purchase prices within remote areas at a much higher price than in areas with all-season motorable roads, keeping the differential close to the cost of transportation.
- Direct the Sajha Cooperatives to enter marketing channels and to purchase farmer's outputs. NFC, in turn can guarantee to purchase from Sajha any quantity of foodgrains or potatoes which the Sajha cannot sell at the pre-designated floor price for primary marketing units.
- Strengthen the food marketing information system by:
 - (1) Reporting price and quantity information through press, radio, and other public media on a regular basis.
 - (2) Strengthening the Early Warning System for information about food production, food stocks and food movement.
 - (3) Expanded market information to include fruits and vegetables and animal products, as well as cereal grains.
 - (4) Improve the quality of internal HMG market intelligence, including food flows and prices, both domestic and international.

5. Implementation of a Long Range Financial and Pricing Strategy

This program features Nepal Food Corporation playing a marketing intervention role. If normal demand is sufficient for

farmers to sell at the announced minimum prices or higher, NFC will not purchase. However, when farm prices fall within a given range of the floor prices, NFC will intervene in the market, purchasing sufficient quantities to push the market price back above the floors.

Similarly, in Kathmandu and other major urban areas, NFC will be sensitive to HMG price ceiling for consumer purchase, without any public announcement of these ceilings. When actual market prices rise above those ceilings, however, NFC will distribute foodgrain and potatoes at the ceiling prices in sufficient quantities to drive market price down to those levels.

6. Separate Emergency Disaster Relief Arrangement

HMG will establish a disaster emergency response unit which will coordinate, on an emergency basis, the services of many different government units in times when landslides, floods, droughts, or other natural disasters strike. That unit will request emergency food supplies, when needed, and NFC will stand ready, from its emergency reserves, to provide what is needed."

Although still lacking in definition of priorities and implementation procedures, this sketch of a new national agriculture and food strategy is impressively comprehensive in scope. Our superficial study of the issues suggests that it is basically sound and deserving of support by donor agencies. It indicates that substantial reforms are under active consideration by HMG. It provides a useful framework for USAID policy dialogues with HMG in the context of concern with foodgrain pricing and subsidy policies. It calls at several points for an increase in food aid to support expansion of food-for-work projects. Pricing and distribution policies are discussed further in the remainder of this section. The food aid issue is the subject of the following major section of the report.

1. Foodgrain Marketing and Price Policies

Records show that government intervention in foodgrain distribution began before the end of the 19th century. It continued during the Rana period. The main concern of those efforts was to supply adequate foodgrains to the Kathmandu Valley where government, army, and police personnel were concentrated. The present system can be traced to 1962

when the Food Management Committee was created, followed by the Food Management Corporation in 1965.

At the present time, the Nepal Food Corporation, operating under the Ministry of Civil Supplies, is responsible for executing HMG's food policies. The main responsibility of the NFC is to operate the subsidized foodgrain distribution program.

The NFC has significantly expanded its distribution activities in recent years (Table 12). It now reaches almost all of the deficit hill districts. The NFC is reported to be recurring substantial losses in its distribution activities given the size of the subsidies provided to recipients. In the most inaccessible districts transportation costs alone can be three or four times the procurement cost of the grain.

Kathmandu Valley continues to be the main beneficiary of the NFC program, receiving 50 percent or more of the total goodgrains distributed. Even with its large losses, the NFC provides only a small fraction of the foodgrain deficit in the Hills and Mountains (Table 13).

Little analysis has been done on the benefits of this program. It is widely believed that poor people in remote areas have little access to the subsidized grains. The main recipients are thought to be civil servants and politically influential people near the distribution points. While anecdotal accounts and our brief field visits are consistent with this view, there is no empirical data or analysis which clearly substantiate these assertions. Much more needs to be known about the targeting of benefits to evaluate the cost/effectiveness of the program. For example, if most of the rice distributed in the Kathmandu Valley is parboiled and consumed mainly by lower-income families, then a favorable distribution of consumption and nutrition imports is likely. This is clearly a priority subject for further research.

NFC procures its grain by open market purchases and also by a levy system. When the Rice Exporting Companies were in operation, they were required to deliver a certain percentage of their export sales to the NFC at a fixed, and below-market, price. This was the source of all of the NFC rice in the mid-70s. With the demise of these companies, NFC was forced to rely more on market procurement. Beginning in 1979-80, levies were nil or not more than 10 percent of exports other than to India, no levy applying to Indian exports. However, in 1983/84 levies were reinstated

Table 12

Foodgrains Distributed by NFC (Mt)

REGION/YEAR	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84
Mountains	1672.65 (6.61)	2574.36 (9.73)	3430.54 (9.81)	3008.01 (9.42)	4501.76 (9.42)	6946.55 (15.14)	6249.84 (14.30)	3284.90 (12.00)	8062.16 (18.03)
Hills (excluding Kathmandu Valley)	9116.73 (36.05)	9832.03 (37.16)	11175.24 (32.98)	10027.26 (31.41)	17717.56 (36.41)	13964.11 (30.42)	11272.90 (25.70)	6484.66 (24.00)	15201.30 (34.00)
Kathmandu Valley	14499.37 (57.34)	14049.14 (53.11)	20347.27 (58.21)	18888.12 (59.17)	26441.27 (54.34)	24985.43 (54.44)	26284.45 (60.00)	17333.47 (64.00)	21445.80 (47.97)
TOTAL	25238.75	26455.53	34953.05	31923.39	48660.59	45896.09	43807.19	27102.03	44709.26

Note: Figures in parenthesis indicate percentages of total distributions.

- a) Mountains: 1) Taplejung, 2) Sankhuwasabha, 3) Solukhumbu, 4) Dolkha, 5) Ramechhap, 6) Sindhupalchok, 7) Manang, 8) Gorkha, 9) Mustang, 10) Myagdi, 11) Dolpa, 12) Humla, 13) Jumla, 14) Mugu, 15) Kalikot, 16) Bajura, 17) Bajhang, 18) Darchula, 19) Baitadi.
- b) Hills: 1) Panchthar, 2) Ilam, 3) Bhojpur, 4) Terhathum, 5) Ramechhap, 6) Okhaldhunga, 7) Khotang, 8) Sindhuli, 9) Makwanpur, 10) Dhading, 11) Nuwakot, 12) Kaski, 13) Syangja, 14) Lamjung, 15) Tanahu, 16) Parbat, 17) Baglung, 18) Arghakhanchi, 19) Gulmi, 20) Palpa, 21) Surkhet, 22) Jajarkot, 23) Dailekh, 24) Salyan, 25) Rukum, 26) Rolpa, 27) Pyuthan, 28) Achham, 29) Doti, 30) Dadeldhura.
- c) Kathmandu Valley: 1) Kathmandu, 2) Bhaktapur, 3) Lalitpur.

Source: NFC.

Table 13

NFC Sales as Percentage of Deficits

Region/Year	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84
Mountains	8.5	8.3	18.7	15.0	11.8	17.0	10.6	4.2	10.7
Hills	34.4	16.0	13.2	14.3	8.5	15.1	25.5	7.0	17.3
Kathmandu Valley	32.2	28.7	37.0	29.4	30.9	29.3	51.8	29.4	44.5

Source: NFC

on private mills and again account for a substantial part of NFC supplies. Millers clearly take this factor into account in setting the prices they pay to producers. As such, the levy system, while it reduces NFC's outlays for grain procurement, serves as a tax on producers.⁸

The HMG attempts to use a policy of quantitative restrictions on exports as a means to stabilize the domestic supply of rice. Export quotas are fixed each year. Exports of rice are also taxed. However, quantitative restrictions and taxes on rice exports are patently impossible to enforce along the 1,000 km of open border with India. Substantial unrecorded trade in many commodities takes place, rice among the most prominent. At the national level, official rice exports are consistently below the surplus of production over national economic demand. Since neither producers nor traders have incentives to hold stocks, and normal year-end stocks of NFC are nominal, it is safe to conclude that substantial unrecorded exports of rice across the border take place.

This point is also important in regard to pricing policies. The Terai rice market is much more closely integrated with north India than with the Hill and Mountain Regions. Higher food prices there, especially in the food-deficit Indian states of West Bengal, Bihar, and Uttar Pradesh, create movement of foodgrains from the Terai surplus production area. This means that prices in the Terai are closely related to bordering Indian market points. Thus, the Terai price is predominantly a derived price reflecting Indian prices and costs of transportation and across-the-border movement. This relationship has been confirmed by several empirical studies. Its existence places a constraint on the degree to which HMG can carry out an independent pricing policy based on domestic production, consumption, and pricing factors.

Although in recent years the government has announced a minimum support price for rice (MSP), the announcement has usually been made well after planting and no system for maintaining the floor price has been in operation. This problem is one of the key issues in food policy. Designing and implementing an effective mechanism for supporting and stabilizing producer prices is a priority area for action by HMG. FAO is providing some technical assistance to HMG in this area. USAID might well

⁸ This was substantiated by interviews in Nepalgunj.

consider making this question a focus of its policy dialogue with HMG and supporting additional analysis. Technical assistance in collaboration with Nepalese institutions would be an effective approach in aiding HMG in the design and implementation of the desired mechanism.

There is evidence that the overall impacts of government intervention in pricing and trade have been unfavorable to agriculture. These interventions occur extensively in both product and factor markets. As a result, the barter terms of trade between agriculture and nonagriculture have trended downward in recent years.⁹ In India, in contrast, domestic terms of trade for agriculture have risen. Fertilizer and credit, the two subsidized inputs, are scarce and unlikely to reach the small and remote producers. The support price policy has not been effectively implemented for the foodgrain crops. Taxes, levies, and quantitative controls on rice exports have created uncertainty in the industry and depressed domestic market prices. While definitive evidence of the role of these interventions in the stagnation of Nepalese agriculture is lacking, it is clear that their overall impact has been unfavorable to agricultural growth and has created constraints on the adoption of new technology and the productivity of public investments in irrigation and other infrastructure and services.

2. Direct Procurement of Foodgrains by the NFC

In addition to the heavy subsidy costs of the existing food distribution program, serious disincentive effects occur both in the Terai where the grain is procured and in the deficit hill and mountain districts where it is sold at prices that do not reflect the high transportation costs. These effects impede the success of other HMG programs to increase production especially in the Hills. In recognition of these disincentives, HMG has announced a program of foodgrain purchases direct from producers designed to assure producers of minimum support prices announced before planting. In 1984/85 the NFC will initiate purchases in 9 Terai districts and 14 districts in the Hills.

In the Terai, the idea behind the new procurement program is to purchase from farmers at the announced minimum support price in order to

⁹ Svejnar, J. and E. Thorbecke, "Macro-Economic Policies and Agricultural Performance in Nepal," draft report prepared for the OECD Development Center, Paris, April 1984, p. 1.

give incentives to producers to increase their output. Purchases by the NFC will be used to supply deficit districts or exported if in excess of distribution requirements. Purchases by the NFC will depend on the relationship between the market price and the support price. If the market price is higher, the NFC will be able to buy little if any. If the support price is higher, the NFC must be ready to buy whatever quantity is necessary to bring the market price back up to the support level. This could squeeze private buyers out of the market and even lead to inflows of grain from India. Operating this system will require an extensive network of buying stations and storage facilities, expert management, and extensive market information. A key policy decision is the minimum support price that is to be announced prior to planting. Good data and sophisticated analytical capabilities will be needed to assess the various factors involved and advise policy makers on appropriate levels and adjustments over time.

In the Hills, local procurement is expected to reduce the financial burden of transportation of grain from the Terai as well as give incentives to farmers to produce more. It is also possible that the program can reduce seasonal price variations in the Hills, which are believed to be large and a detriment to production. It is not known how responsive producers in the Hills are to price incentives. More analysis of this question is badly needed. Moreover, the higher purchase prices will result in higher consumer prices in the local markets unless sales of the foodgrains by the NFC continue to be subsidized. These higher market prices will impact unfavorably on families who must purchase some or all of their foodgrains. Even foodgrain producers who are less than self-sufficient will be faced with higher prices for any grain that they purchase to supplement their own production. Which grains to purchase and at what prices to buy and sell become critical decisions in this approach. For example, purchases of maize, millets, and barley for sale to consumers at subsidized prices might well target benefits more to poorer producers and needy consumers in comparison to paddy and wheat operations. These questions clearly warrant deeper analysis.

3. The "Market Integration" Approach to Regional Development

Earlier, reference was made to the possible conflict between regional food self-sufficiency and regional development based on interregional trade

and comparative advantage. While HMG has a strong commitment to promote food self-sufficiency in the hill and mountain districts not yet linked to the national road network, considerable foreign and local investment is also going into area development projects and road construction to integrate additional areas into the national economy.

But roads alone do not assure production and employment increases and integration of hill areas into a national system of exchange based on comparative advantage. The Lamosangu-Jiri Road, completed under the Swiss-assisted Integrated Hill Development Project (IDHP) and supported by a WFP food-for-work grant, is an interesting example. This road links the hill villages in the Jiri region to each other and to the "Arniko Highway" leading to Kathmandu. The road has facilitated the delivery of goods, services, and inputs to an area containing farm-land, pasture, and forests. The area development project has been in existence for more than 10 years and followed the "Multipurpose Development Project" carried out in Jiri during 1960-71, also as a Swiss-supported project.

In an interview, the SATA Director expressed concern over the extent of growth of population and incomes in the area and surprise to the opening of the road. His perception that the flow of goods has largely been from the Terai and Kathmandu to the hill area with little in the way of reverse exports from the project area was also disturbing. This experience should provide an instructive case study of the "market integration" approach to hill development based on improved transportation and market integration. It suggests the need for much more careful evaluation of the effects of the opening of roads on food prices, production patterns, and incomes in the areas involved. This question is being examined in the assessment of rural roads in the Rapti Area Development Project, which will be completed in Fy '85 under USAID sponsorship.

4. Foodgrain Production Potential and Constraints

As discussed earlier Nepal's foodgrain production growth has been less than dynamic during the last 20 years. With the exception of wheat, stagnant or declining yields have created a growing gap between population growth and food grain supply. While an expansion in the area under cultivation somewhat concealed this gap through the 1970's, the gravity of the long-term problem is now beyond dispute.

The scope for expansion of cultivated area is believed to be extremely small. In the Hills and Mountains substantial areas of marginal land are already in use as a result of increasing population density and declining yields. Erosion and a lack of animal manure due to the growing use of dung for fuel lead to still lower yields, further deforestation, and continued deterioration of the fragile resource base in the hill environment. While clear evidence of the remaining potential for expanding cultivated area in the Terai is lacking, that which remains will be more expensive to bring into production and more demanding of technology and management for producing field crops of a sustained basis.

This leaves increasing yields per unit of land as the source for production increases in the future. Yield increases result both from higher yields of a given crop and from increasing cropping intensity through more double or triple cropping. Since yields of foodgrain crops are generally low in Nepal compared to international standards, the potential for improving yields through improved varieties, new techniques and cropping systems, and more fertilizer and other inputs is substantial.

The Terai offers the most readily achievable potential for yield increases of the major foodgrain crops. Extension of irrigation is one means but that requires both investment in water distribution and organization for efficient water use. Impressive productivity increases have also been achieved in the Terai under rainfed production with improved cropping systems and varieties and increased use of fertilizer. The service and commercial infrastructure to support yield increases in the Terai is much superior to that of the Hills. Output growth in the Terai will better supply domestic economic demand and provide exportable surpluses, benefiting Terai producers, urban consumers, and the country's balance of payments. It will not solve food deficit problems in the hills due to high transportation costs and the lack of purchasing power by the poor people who live there.

This point provides strong support for programs to increase productivity in the Hills. Experiments conducted under the Integrated Cereals Project provide some grounds for optimism. They suggest that substantial increases in yields are possible using the package approach devised by the project. This approach aims at improving the total annual productivity of a farm unit, not just yields of a single crop. This approach has special validity where crop and animal production are as interdependent as in the

Nepal Hills and Mountains. Factors considered in this approach include crop combinations, varieties, cultivation practices, and--to some extent--fertilizer applications.

Much is still to be done to create the research base for generating improved technology in the Hills, not to mention the need for an effective extension system to bring the knowledge to farmers' fields. Timely provision of inputs--especially fertilizer--is a daunting challenge in districts one, two and even three weeks walk from the nearest road connection point.

Given the need to prevent further losses of fertile soils in the Hills and the restrictions on foodgrain production due to transportation costs, we are appreciative of HMG's intentions--outlined in the Master Plan for Improved Food Supply--to use food-for-work for local irrigation and erosion-control projects and to extend the network of jeep tracks and trails, based on expanded food aid. This issue is discussed in the following section of the report on food aid.

THE ROLE AND LIMITATIONS OF FOOD AID

EXISTING FOOD AID PROGRAMS

The World Food Programme is the only continuing food aid donor in Nepal.¹⁰ Table 14 summarizes its activities, which include mother and child feeding programs, resettlement schemes in the Terai, and food-for-work for road construction and small scale irrigation works. In 1983, 16,081 metric tons of food commodities were provided by WFP. In 1984, it is estimated that 8,233 metric tons of commodities will be provided during the first half of the year. This indicates that the expected yearly total will be on par with 1983. Other than the anomalous figure for 1980, a year of major emergency relief operations, there has been a slow but steady rate of expansion of WFP activities in Nepal (Table 15).

Wheat has been the major commodity donated. In combination with other wheat products, i.e., wheat flour and wheat/soy blend milk, wheat makes up the vast majority of tonnage provided by WFP. Dried skim milk has also been provided in significant quantities, as well as pulses and vegetable oil. Recently some of the pulses donated by WFP were locally purchased, largely due to the inacceptance of imported varieties. In total, however, the cereal grains donated by WFP make up less than one percent of the total production, as do the pulses, milk and vegetable oil.

Another interesting aspect of present food aid projects is found in Table 16. This table reports the percentage of project costs represented by food, external transportation, internal transportation, and materials, equipment, administration and supervision.

Food generally represents only approximately one-third of the total project costs. Combined with external transport, all of which are paid for by WFP, this comprises around half of the value of most food aid projects. Internal transport and handling is half paid for by WFP, with the other half the responsibility of HMG. This local expenditure by HMG for transport and handling, coupled with the materials, equipment, administration and supervision, comprises from one-quarter up to almost half of the total costs of food-for-work projects. This fact is extremely important. It shows that food aid creates a major strain on domestic resources. There is

¹⁰ Other countries donate food during droughts and other natural disasters.

Table 14
Operational WFP Projects in Nepal

PROJECT NUMBER	TITLE	DURATION YEARS/MONTHS	PLANOPS/LETTER OF UNDERSTANDING SIGNED (DATE)	UTILIZATION COMMENCED (DATE)	COMMODITIES COMMITTED	QUANTITY (M.T.)	ESTIMATED COST OF WFP COMMITMENT (US \$)	TERMINATION (DATE)
709 EXP.	Feeding of Mothers, Infants & Children	4 Years/ 9 Months	7.12.1979 14. 2.1984	15.3.1980	B. Oil D S M WS B/M Wheat	12 4,856* 9,259* 1,000	9,541,700*	31 Oct 1984
2045	Construction and Improvement of Mule Trails & Jeep Tracks	8 Years	16. 7.1976	1. 1.1977	Wheat/Maize Wheatflour Edible Oil D S M Pulses	9,786* 276 390 502 698*	4,930,200*	28 Feb 1985
2232 Exp.	National Dairy Development	3 Years	24. 9.1982	21.10.1982	D S M Butter Oil	1,900 151	2,760,200	20 Oct 1985
2233	Resettlement in the Terai	5 Years	24. 8.1978	1. 9.1979	Wheatflour/ Maizeflour D S M Pulses Edible Oil Wheat	13,842 1,628 651 977 2,884	9,988,730	1 Sept 1984
2235	Construction of Feeder Road in Jiri Area	6 Years 10 Months	18. 7.1977	27. 2.1978	Wheatflour/ Maizeflour Pulses Edible Oil	11,600 870 870	6,620,754	31 Dec 1984
2660-Q	Construction of Naudanda-Beni Road	2 Years 6 Months	14.12.1982	7. 6.1982	Wheatflour D S M Pulses Edible Oil	1,000 260 82 110	1,053,944	31 Dec 1984
1304	Emergency Food Assistance for Drought Victims	60 Days	14.12.1982	4. 2.1983	Wheat	10,000	3,680,000	
2747Q	Construction of Small-Scale Irrigation	1 Year	1984		Wheat	6,920	1,766,000	
2748Q	Construction of Feeder Roads in Food Deficit Areas	1 Year	1984		Wheat	7,202	1,838,000	

* Including Bridging Operation

Table 15

Food Commodities Supplied by World Food Programme
From Fy 1978 to Fy 1983 (Up to December 1983)

COMMODITIES	1978 (M.T.)	1979 (M.T.)	1980 (M.T.)	1981 (M.T.)	1982 (M.T.)	1983 (M.T.)	TOTAL (M.T.)
Wheat	2,321	2,511	22,311	14,294	1,552	13,084	56,073
Wheat Flour	946	4,406	2,803	2,007	7,376	3,681	21,219
Wheat Soy Blend/Milk	1,391	178	1,192	1,194	1,755	2,661	8,371
Pulses	167	488	300	181	511	372	2,019
Dried Skim Milk	1,155	920	1,158	1,453	2,592	3,200	10,478
Vegetable Oil	169	470	352	90	516	311	1,908
Butter Oil	10	10	30	78	47	151	326
TOTAL	6,159	8,983	28,146	19,297	14,349	23,460	100,394

WFP/25.5.1984

Table 16

Distribution of Food and Project Costs, in Percentages

Project Title	Food ¹ Costs	External ¹ Transport & Handling	Internal ² Transport & Handling	Materials, ³ Equipment Administration & Supervision
Feeding of Mothers, Infants & Children	59.1	20.2	7.8	12.
Construction of Improvement of Mule Trails & Jeep Tracks	44.5	21.9	14.8	18.8
NAT'L Dairy Development	32.0	9.7	1.9	56.4
Resettlement in the Terai	37.4	15.3	1.3	46.0
Construction of Feeder Road in Jiri Area	33.5	22.0	6.0	38.5
Construction of Naudanda-Beni Road	32.9	21.7	7.6	37.8
Construction of Small- scale Irrigation Works	36.1	12.4	8.2	43.3
Construction of Feeder Roads in Food Deficit Areas	49.5	17.0	11.3	22.2

¹ Borne by the World Food Programme

² One-half borne by WFP and one half by HMG

³ Borne by HMG

no free lunch. This figure is pertinent to the following sections which discuss the inadequacy of non-food inputs and considerations further expansion of food aid activities in Nepal.

ROLE OF OTHER DONORS IN FOOD AID ACTIVITIES

World Food Programme is the only continuing food aid donor in Nepal. The counterpart for its activities is HMG, which technically assumes all responsibility for the food once it enters Nepalese territory. Nevertheless, given the limited financial resources of WFP as well as HMG, the question arises as to whether and what extent food aid projects are directly linked with activities of other donor agencies.

The only example of coordination between a WFP enterprise and those of other donors we found was in the construction of the Lamosangu-Jiri road, and feeder roads in the Jiri area of Eastern Nepal. A major black top road between Lamosangu and Jiri is being financed by the Swiss Association for Technical Assistance (SATA). The 105 kilometer road was estimated to cost about US \$20,000,000. SATA's contribution covers approximately 90 percent of the costs, with the remainder provided by HMG.

WFP has supported SATA's road construction activities with the provision of food assistance. What distinguishes this project from other WFP activities are a number of important factors. The need for the road, and its developmental impact, were established by the Swiss prior to consideration of the role for food aid in the project. In fact the project began a couple of years before food assistance was integrated into the scheme. This was the case of a development project designed and planned to achieve an objective, which thereafter made use of food aid to provide a subsidized ration to workers. The rationale was not only to encourage expenditures on food, but to prevent and relieve the shortfalls in locally available food supplies due to the infusion of cash wages into the food deficit region.

Another important distinction between this and other food-for-work projects was that workers were paid in cash; in turn, they had access to WFP commodities at subsidized prices. Thus, the often inevitable problem of workers re-selling food to get cash for necessary non-food expenditures was reduced. Similarly, the two most serious and often debilitating

problems of FFW projects, being improperly designed and inadequately executed due to a shortage of technical supervision and complementary inputs, were mitigated to a great extent by the infusion of technical and capital inputs by SATA.

A number of problems and questions did arise in regard to the support of the SATA road project by WFP. First, given that workers were receiving the standard regional cash wage, it is curious that WFP commodities were sold at highly concessional rates (50 percent of their market value). This clearly is in contradiction to the discussion below concerning setting wage rates equal to the prevailing supply cost of labor. Apparently some of the sub-contractors on the road were observant enough to spot this problem and reduced cash wages accordingly.

Second, the responsibility for bringing the food to the project site and overseeing its distribution fell to others than the SATA staff who were responsible for the construction of the road. This problem arises since WFP only has responsibility for monitoring the food to the border; thereafter, HMG takes over as the operational counterpart. According to Swiss officials, food commodities often arrived late or not at all. There were also considerable illegal transactions, such as the food being trucked to the project site, being unloaded, only to be subsequently re-loaded on to the trucks for transport to Kathmandu for re-sale. Such reports of blatant mishandling are disturbing in their own right. However, they are usually debilitating because workers do not get their food due to such breakdowns, and workstops. The fact that this road project paid wages in cash, and was not dependent on the vagaries of untimely food arrivals, improper storage, and dishonest food handlers, assured that the work continued. In other FFW projects, these breakdowns would have had more serious implications.

This model of cooperation between a bilateral development agency, SATA, and multilateral food and donor, WFP, merits closer consideration on the part of USAID. There is ample opportunity for such mutual reinforcement in cases where USAID is undertaking major development schemes which employ large numbers of laborers in food deficit areas. WFP, as is always the case, is constrained by lack of money to transport food and use the commodities in the context of sound and well managed development projects. Integration of financial aid supplied by USAID and food aid provided by WFP is thus a viable possibility. Such cooperation should be considered

before exploring a new PL 480 Title II Program in Nepal. There is no reason for USAID not to seek the cooperation of WFP in projects where food aid is deemed legitimate--where the project will greatly increase the demand for short-term food supplies in food deficit regions. Such complementary approaches can serve to benefit both USAID and WFP, taking advantage of the institutions respective comparative advantages.

One specific example, explored with both WFP and the USAID Rural Development Office, was the possibility of collaboration in connection with the USAID funded Rapti project. Road construction is an element of this rural development scheme. WFP assistance, as partial payment in-kind along with cash wages, appears to be a reasonable proposition. Not only will WFP be assured that its commodities are used appropriately for developmental purposes, but USAID's limited resource base will be expanded. Needless to say, some of the logistical and managerial problems incurred with the SATA project will have to be addressed in any such collaboration. However, we foresee no major obstacles to developing a realistic and implementable plan of operations in this context.

COST-EFFECTIVENESS

As stated previously, the concern of this report revolves around the appropriateness of food aid as a vehicle to promote agricultural and economic development. In an ideal world, we would therefore look at the benefits of food aid projects in comparison to the costs of the aid employing traditional economic criteria such as net present value or internal rate of return. These would then be compared among different food aid projects, and with other non-food aid projects to determine the relative benefits of various food and non-food aid projects.

Unfortunately limited resources and technology available for such appraisals preclude their widespread application. In addition, such an approach would raise as many questions as it would answer. The reasons are two fold. First, it can not be assumed that food aid is a fungible resource. Therefore, comparisons between food and non-food programs are subject to the opportunity cost placed on food versus financial aid. Second, there are inherent conflicts in public works projects in general, and food-for-work projects in specific, in selecting activities, participants and sites to maximize the marginal utility of the food transfer and selecting

activities, participants and sites to maximize the marginal productivity of the project.

To illustrate, the project installed in a region with superior natural resources or that has achieved a critical level of social and economic infrastructure (e.g., market access) will often have greater economic returns for the given investment. Similarly, more productive investments in terms of generating a stream of long-term benefits may be less effective in creating employment in the short-term, or be less effective in terms of its redistributive effects. In order to illustrate these types of trade-offs in terms of a typology of project types, for the ease of generalization, seven project types can be identified.

- (1) Relief Projects are designed to respond to acute shortfalls in food availability and/or income, attributable to a natural or man-made disaster (e.g., war or severe weather causing destroyed irrigation systems, wrecked storage silos, delayed planting of foodcrops). These generally cover a single crop cycle by providing food to compensate for lost sources of income and production shortfalls.
- (2) Directly Productive Projects involve efforts to directly promote economic growth, usually in terms of agricultural production. The creation of physical assets, such as irrigation, flood control and drainage to increase agricultural output, the reclamation and improvement of land, forestry programs to increase fuel wood availability, and watershed management to conserve soils and to forestall erosion and desertification fall in this domain. Increasing the amount of land in production and intensifying the use of land presently cultivated are the usual purposes.
- (3) Economic Infrastructure Projects are intended to enhance regional economic development through the relief of bottlenecks or constraints to economic development. The construction of roads, markets, post-harvest storage facilities and the like fall in this category.
- (4) Social Infrastructure Projects include the construction of schools, health care facilities, community buildings, as well as private houses. These investments in health, education, and basic needs address social and environmental causes and manifestations of underdevelopment. They are designed to enhance the quality of human capital and thereby increase productivity and stimulate economic growth.

- (5) Training Projects take two major forms. The first involves using formal or non-formal techniques to train small farmers, tenants, and other agricultural workers to improve agricultural practices. The second type of training involves the development of specific marketable skills for small-scale commercial enterprises and cottage industries.
- (6) Agricultural Adjustment Projects involve using food as payment and insurance to small farmers willing to innovate and/or alter crop mix.
- (7) Land Settlement and Transmigration Projects provide food as payment and encouragement to inhabit and/or develop new regions or areas, until agricultural self-sufficiency is achieved.

For each project type, the effects on employment creation, redistribution effects and economic returns are presented in Table 17. Distinction is made between the construction phase when the food is actually flowing into the community and the work is being performed by program recipients (i.e., the people doing the work), and the operational phase when the flow of food has ceased and thereafter the beneficiaries reap the consequence of the work performed by recipients. In the operational phase, it is assumed that the skills learned, assets produced and infrastructure created are operating, the food aid is no longer entering the project area, and distribution to recipients has ended.

Indeed, the generalizations in Table 17 are not applicable to all projects, and are dependent upon the individual project context. Nevertheless, the major lesson to be learned is that there are inherent conflicts among the typical goals of food-for-work projects, and between their achievement in the short and long-term. Resolving these conflicts is an exercise in formulating a sound and consistent development strategy, and thereafter retrofitting the food aid into such a coherent framework.

To illustrate, first consider the trade-offs between an irrigation and roads project. The former may have the greatest benefit in terms of increasing output. However, the costs in terms of skilled labor, equipment and complementary resources may be greater than a roads project. The roads project may therefore provide more jobs per dollar spent. Similarly, irrigated land may be primarily owned by the large land owners, rather than the rural landless; however, this may be considered an acceptable

Table 17

Objectives of Food-For-Work Projects

PROJECT CATEGORY	EMPLOYMENT CREATION (AND INCOME EFFECTS)	REDISTRIBUTIVE EFFECTS	ECONOMIC RETURNS, e.g. AGRICULTURAL OUTPUT
Relief Programs	Short Term: High Long Term: None	Short Term: In Favour of the Poor Long Term: None	Low
Productive Assets, e.g., wells, cleared land	Construction Phase: Low to Medium Operational Phase: High	Construction Phase: In Favour of the Poor Operational Phase: Usually In Favour of Landowners	High
Training Projects	Short Term: Low Long Term: Low	In Favour of the Poor	Low to Medium
Economic Infra- structure, e.g., roads, market facilities	Construction Phase: High Operational Phase: Low to Medium	Construction Phase: In Favour of the Poor Operational Phase: Variable	Medium
Social Infrastruc- ture, e.g., health clinics, community centers	Construction Phase: Low to Medium Operational Phase: Low	Construction Phase: In Favour of the Poor Operational Phase: Usually In Favor of the poor	Low
Agricultural Adjustment	Short Term: Low Long Term: Medium	In Favour of the Poor	High (if producer environment i.e., ratio of output to input price, is favourable)
Land Settlement	Short Term: High Long Term: High	In Favour of the Poor	Variable

cost for increasing production in a deficit area, with the hope that the demand for wage labor will increase and prices of foodgrains will fall, thereby indirectly benefitting the poor.

Of course there are numerous reasons why the economically marginal population groups may not benefit. For example, if cash crops are produced or food crops are exported from the region, prices of staple foods will not be reduced. Similarly, if the supply of labor is highly elastic wages may not rise; or in the case of labor bottlenecks, producers may choose to mechanize rather than let wages increase.

A second illustration is to be found in terms of the decision as to whether agricultural investment should take place in the Terai versus the Hills. Undoubtedly the comparative advantage of the Terai as a food production area, including the accessibility of market infrastructure, will make such investments economically more productive. However, there is an explicit policy stated in Nepal's Master Plan for Increasing Food Production to make all food deficit regions self-sufficient. While we question the long-term wisdom of this strategy, and suggest that it must be the subject for further research, it amply illustrates that effectiveness in terms of the stream of economic benefits per dollar invested may legitimately be of second priority. That is, it is legitimate to relegate the benefit-cost ratio (or similar measure like the net present value) of a project to a secondary consideration, if short-term welfare or redistributive effects predominate.

It is not within our domain to evaluate specific food aid projects, nor to make unequivocal recommendations on the wisdom of the Nepal food strategy being formulated. Rather, the point to be underscored is that depending on the criteria chosen for effectiveness, and whether this is measured in the construction or operational phase, one would reach rather different conclusions concerning the success of a food-for-work scheme. Thus there is no "correct" effectiveness criteria for all projects. Compounding this problem is that even if one could state unequivocally that, for example, economic expansion was the major purpose of the undertaking, the methods and resources are not available to assess the impact in terms of the net present value and internal rate of return of projects.

We are left with resorting to more subjective measures which can only provide a glimpse into effectiveness in terms of proxy indicators. One option is to consider a cost-effectiveness criteria in terms of the choice of commodities for a given project. This procedure is discussed in the next section.

Finally, the cost-effectiveness of food-for-work activities, will inevitably reflect that of overall food sector planning. The comprehensive Master Plan to Improve Food Supply in Nepal now being prepared presents an encouraging step in the overall coordination and integration of food-for-work activities in a larger framework. This point is also discussed further in the following sections.

CHOICE OF COMMODITIES

There are two interrelated issues when considering the choice of commodities employed in a food aid project. The first is that of acceptability. Are the foods provided found in the normal diet of the population? If not, are the donated commodities acceptable substitutes or complements to indigenous food stuffs? Second, what is the cash equivalent value of the commodities supplied based on local prices, in relation to the costs of the commodities? Based on these two questions of acceptability and value of the commodities there appears to be considerable room for improvement in the choice of foods flowing through the aid pipeline.

1. Acceptability

Stories abound in Nepal concerning how households have found the choice of commodities socially and culturally unacceptable. Whether it be the donated lentils, which were subsequently replaced by locally grown pulses because of the difficulty of preparing the former, or the mothers trying to use powdered milk as a soap or white dye rather than a food-stuff, these anecdotal accounts are similar to those heard in many countries. Likewise, the inappropriate, and possibly deleterious effects of commodities such as non-fat-dried skim-milk being used as an inappropriate substitute for breastfeeding or inadequate weaning food are all familiar accounts. They are undoubtedly based on widespread perceptions which merit consideration.

Thus, the inappropriate use of food commodities can be harmful, especially regarding infant feeding practices. On the other hand, unacceptable commodities may simply be re-sold. Re-sale of in-kind payment is not necessarily bad in and of itself. In fact, re-sale can be anticipated and may represent a reality which can be exploited for the purpose of

maximizing the cost-effectiveness of the income transfer (i.e., wages) represented by food aid projects. This is the subject of the cost-effectiveness framework described briefly below which we recommend be employed for all future food-for-work projects in Nepal.

2. Cost-Effectiveness

The food aid employed in public works schemes, resettlement projects and the like is a form of income in-kind, either as payment for work performed or as an incentive. Each ration provided to program recipients thus has a cost, which includes the value of the commodity to the donor agency and the costs of transport and handling to either the donor and/or recipient country, Nepal. The benefit of the program, to a given recipient can then be determined on the basis of the value he/she receives for the work performed. Integrating these costs and benefits into a single framework, we can estimate a parameter which has been described by Reutlinger¹¹ as:

$$E_i = \frac{V_i}{K_i}$$

- where
- V_i = the dollar (or Rupee) value cleared by the recipient per ration.
 - K_i = the dollar (or Rupee) cost, including acquisition and transfer cost, of delivering commodity i per ration.
 - E_i = the cost effectiveness of the project's commodity choice.

In the case where the donated commodity is consumed in the diet of the recipient, the determination of V_i , the wage provided by participating in a project, is the sum of two components: (a) the retail price of the commodity times the amount of that commodity provided which is normally consumed; plus (b) the wholesale price times the quantity of the commodity provided which is in excess of the amount of the same food that is being consumed in the diet of the recipient. For example, assume the recipient receives 10 kg of wheat. Prior to participating in the program he consumed 5 kg of wheat. The value to the recipient is the 5 kg times the retail price at which he was purchasing wheat, plus 5 kg times the wholesale price he can sell the remainder at, accounting for transaction costs.

¹¹ National Research Council, Nutritional Analysis of Public Law 480 Title II Commodities, Food and Nutrition Board, Washington, D.C. 1982.

To simplify this calculation, a reasonable proxy is simply to use the whole-sale price times the entire quantity received, understanding that this simplification will under estimate the true value to the recipient.

The above calculation says nothing about how the recipient chooses to allocate the extra income he receives; it simply indicates the extent to which his budget constraint is relaxed in the face of a given project dollar spent by the donor and host country. The marginal propensities to consume in various goods, which is determined by each household's preference ordering, will then dictate how expenditures shift.

One problem with this construct arises when the household receives a commodity that it does not normally consume. For example, consider the case of a blended food such as wheat/soy-blend (WSB). The value of such a food to the project participant can be calculated by the sum of: (a) the price of food for which it substitutes in the diet (e.g., WSB for wheat, salad oil for ghee) times the extent to which the substitution takes place; plus (b) the price at which the new food commands on the open market times the amount sold. In (a) above, the price of the substitute commodity, not the donated commodity, is used because that better represents the increased opportunity provided to the recipient. Also, note that this type of analysis assumes the marginal propensity to consume food out of in-kind income is the same as from cash income. Experience suggests this is a good approximation of reality; although, this represents an important question as need of further research.

In order to employ this commodity cost-efficiency criteria in the selection of commodities for food aid programs in Nepal, the data requirements are as follows. To calculate V_i , one needs timely market data on retail and wholesale prices of foods normally found in the diet, as well as the sale price of commodities, e.g., milk powder, blended foods, not normally found in the existing diets. In addition, the average quantity consumed of each donated commodity, or its major substitutes in the diet, must be known. When foods which do not occur in the existing diet (e.g., soybean oil), are provided, one must also make judgements as to whether there is indeed a close substitute commodity in the normal diet (e.g., mustard oil, ghee); or whether there are no substitutes, in which case the value is strictly the quantity received multiplied by the re-sale price in the local market, minus any transaction costs incurred (e.g., the opportunity cost of the time and effort going to the market to sell the food aid).

The calculation of Ki requires that we have data on the economic cost to the World Food Programme of the commodities it provides (e.g., world market price), the cost of international freight, plus the cost to the government of Nepal of inland transportation and storage. Now, it is possible to reframe our question of cost effectiveness purely in terms of the costs of HMG in relation to the effectiveness, i.e., value, to the recipient population. Ei would then tell us which commodity HMG is best off distributing to maximize the value of the transfer to the recipients for a given rupee it expends, not taking into account the costs of the donor.

A simple attempt is made below to employ this cost-effectiveness criterion in terms of various commodities that are programmed in Nepal. The purpose is not to evaluate WFP activities, but rather to illustrate a recommended approach to considering commodity selection in future food aid projects in which USAID may be involved.

In Table 18 the values of Ei for four commodities are presented. The simplifying assumptions for the calculations are that the external and internal handling costs, i.e., dollars per kilogram per kilometer, are the same for all commodities. Similarly, it is assumed that the size of the food ration is not greater than the quantity of the food which would be consumed before receiving the donated commodities. To the extent that this is not true, wholesale rather than retail prices should have been multiplied by the quantity received, to determine the values to the recipient. Ei is thus possibly overstated. However, the extent of overstatement is considered equal across commodities, so comparisons remain valid.

In the table, two Ei values are given. The first Ei accounts for all the costs of delivering the food aid. This includes the real economic costs of the donated food as determined by international prices. The second Ei only considers cost-effectiveness from HMG's perspective, not reflecting any of the costs assumed by WFP.

The clear implication is that vegetable oil should be the primary commodity provided by food aid projects. It has an Ei value of 1.3 if it substitutes for mustard oil, and 2.88 if it substitutes for ghee. This reflects the relative high cost of edible oils in Nepal relative to the world price. From a purely domestic standpoint this finding is even more accentuated. For a given cost incurred by HMG in handling food aid, a much greater income transfer accrues to project recipients if vegetable oil,

Table 18

Cost-Effectiveness of Food Commodities

Commodity	Food Value to WFP \$/TON	External Transport \$/TON	Local Transport \$/TON	Local Market Price (Retail)	Cost Effectiveness Considering all Costs Ei	Cost Effectiveness Consider only HMG Costs Ei
Wheat Flour	260	218	76	212.5	0.42	2.88
Pulses	547	218	76	488	0.58	6.42
Vegetable Oil	803	218	76	1430 ¹ (3163) ²	1.30 ¹ 2.88 ²	18.82 ¹ 41.62 ²
Rice	400	218	76	218.5	0.31	2.87

1. Based on the market value of mustard oil

2. Based on the market value of ghee

rather than other commodities are provided. This largely reflects that more value can be delivered to recipients by transporting oil, rather than cereal grains, for the costs of transportation assumed by HMG.

This stylized example admittedly has its drawbacks. If a tremendous quantity of any given commodity (e.g., vegetable oil) was dumped onto the market through food aid programs, it could have a deleterious impact by lowering prices. Given the volume of food aid at present, this is unlikely on a national level. However, such a phenomenon could be observed locally in cases where there are thin markets for commodities (e.g., rice in the hills). In addition, if only oil were provided in a ration, so that large quantities were resold, oligopsonic marketeers could depress the local wholesale price, thus lowering its value. Similarly, if there really are supply bottlenecks which limit workability of cereal grains, on which a large proportion of the money received from selling (or saved from not having to purchase) oil will be spent, then the food price inflation would imply E_i is the wrong criteria for selecting food aid commodities.

Despite these possibilities, the analysis clearly shows the merits of trying to increase dramatically the proportion of oil in food aid rations. This could be tried at a number of different sites in different proportions. Such an experimental approach should monitor local commodity prices. This would indicate at what point negative side effects occur. It would also suggest the most cost-effective ration for food aid projects in different areas of Nepal.

SIZE OF RATION

Complementary to any guidelines on the choice of food commodities must be a discussion on the size of the ration distributed. In combination these factors determine the value of the wage provided to workers. By varying the ration size, one will attract different members and type of individuals to participate in a food-for-work project. But once again, there are tradeoffs between coverage, type of workers attracted, and the ration size.

To illustrate, wages which are below the going rate in a region will tend to attract only the most indigent workers in the community; or no workers at all in some cases. In addition, if a ration represents a value

below local minimum wages, it is likely that the household will not be able to achieve basic dietary requirements. Thus, setting the ration size will determine the value of the wage goods, and whether projects will succeed in attracting workers and providing them reasonable remuneration.

The problem of the implicit wage being set too low has arisen in Nepal in connection with the precipitous fall in wheat prices in 1984. According to a WFP Evaluation Mission, "the workers no longer found the WFP ration an adequate incentive in January 1984 (and) work ceased on the WFP-assisted project." This fact clearly indicated that workers primarily view in-kind food income as a wage good; and only secondary is it considered as a source of calories, since the participation in the project fell despite that the absolute size of the ration remained the same, although its value declined, due to the fall in prices on the local market.

The solution proposed to this problem by the WFP Mission was to increase the ration size. Instead, we would argue another approach as warranted. First, as remarked elsewhere, the fact that the price of wheat fell from Rs. 3.50 in November 1983 to Rs. 1.80 in April 1984 was indeed a major food policy failure. It is even more disconcerting when one considers that wheat imports were simultaneously being provided through WFP.

Despite the difficulties in doing so, there are two better approaches to the declining value of the wage represented by the ration. The first would be to search for alternatives to the ration's composition, rather than increasing the size. This would be an accordance with the recommended cost-effectiveness criteria for commodity selection. It would also reduce the likelihood that the provision of WFP commodities will aggravate a problem of over abundance of a foodstuff in the market, thus causing farm-gate prices to fall. The second would be to promote a price floor which would avoid precipitous declines in the local price of staple food-grains. Clearly this second recommendation is beyond the scope of WFP or USAID. It amply illustrates, however, how the effectiveness of food aid is conditioned by more general food policy concerns.

The converse of wages being too low at the food-for-work site occurs when the size and composition of the ration raises the wage equivalent above those prevailing for similarly unskilled workers in the local market. The expected result is to draw workers out of other productive areas of employment to the food aid program. Once again the threat of this problem

appears to have materialized in Nepal in connection with WFP's support for the Jiri road project. The director of SATA suggested that it was likely that as a result of the work on the road, some labor was taken away from normal agricultural activities. Of course, in this instance wages were paid in cash, and the subsidized WFP commodities were available for purchase by workers. Similarly, a member of the Planning Commission and the former Secretary of the Ministry of Food and Agriculture expressed his opinion that labour was undoubtedly drawn away from other productive areas of endeavor, and that agricultural output suffered accordingly. Once again, these anecdotes need be taken for what they are. There is a lack of empirical evidence in their support. The Swiss unfortunately did not feel a need to collect data on such issues. Nevertheless, given that normal cash wages were supplemented with the subsidized food aid, this conjecture seems plausible. It cautions against repeating such mistakes, and reinforces the need to set ration size on the basis of trying to achieve comparability to local wages.

LOCAL PURCHASE OF FOOD COMMODITIES

The problem of providing farmers with a reasonable price for their produce, and the role of the Nepal Food Corporation in that regard, has been discussed earlier in the report. One method of supporting the low farm-gate prices in Nepal would be through considering local purchase of food by food aid donors. This would involve the donors procuring needed commodities in Nepal, rather than in the U.S. or Australia or other donor country. The questions, therefore, are (1) is there any local purchase scheme at present; (2) under what circumstances is it appropriate; and (3) what factors limit the scope for this approach.

The World Food Programme purchases lentils produced domestically in Nepal. The value of local purchase represents considerably less than one percent of the total value of WFP commodities distributed in the country. The recent move allowing for local purchase of pulses came about when a high ranking WFP representative from Rome, received serious complaints from high ranking HMG officials that the pulses being supplied were unacceptable, especially given the duration required for their preparation. Pressure cookers are not a frequent item on the Nepali landscape, while a

scarcity of cooking fuel is. According to the officials with whom we spoke, WFP headquarters shortly thereafter approved local purchase of indigenous and acceptable pulses.

The question arises, however, as to whether there are other circumstances in which local purchase is appropriate, and feasible. Concerning the former issue, one need go no further than examine wheat prices and production in Nepal during the past couple of years to see an obvious opportunity as well as compelling need for local purchases. As shown in the figures above, wheat is the major commodity which had, until this year, shown some increase in productivity and output in Nepal. The strenuous efforts of donors to encourage adoption of high yielding varieties (HYVs) has met with considerably greater success than for other commodities. But the events of 1983 portend a rather serious consequence for the future of wheat production and probably other crops as well. The bumper harvest, coupled with other conditions in India, resulted in the bottom falling out of the wheat market. The price of wheat fell by more than 50 percent from trend levels. Farmers were left unable to even recoup their cash costs of production for the crop. It is hard to justify importing wheat, even in the form of aid, when the same commodity was in gross surplus and being exported to neighboring India at disastrously low prices. In fact, it was not only the Hill regions of Nepal that were receiving donated wheat during this period of local surplus and low prices; the Terai was also receiving food aid as part of the resettlement schemes.

No doubt, the small amount of WFP commodities relative to the total wheat market do not allow one to lay blame on WFP for the outrageously low wheat prices received by Nepali farmers. In addition, the wheat in the food aid pipeline had obviously been programmed well before the crisis in wheat markets materialized. However, it is equally apparent that providing wheat aid in periods of abundance can only exacerbate a bad situation. It further represents a direct form of discouragement for HMG to make the requisite policy changes in working toward setting up a system of price supports to avoid a recurrence of such a situation.

Local purchase is clearly indicated. First, it is justified in terms of the agricultural economy in Nepal. Second, the relative costs of cheap wheat available for local purchase versus incurring the expense of shipping the same commodity, with a higher opportunity cost in the U.S. (based on international prices) half way around the world, is a persuasive argument

for local purchase. This may nevertheless not be feasible. WFP is not to be blamed. They are charged with programming the disposal of the surpluses of the West. The purchase of local commodities is just not a global reality given the relatively small contribution of cash versus food resources pledged to WFP. (The restrictions of local purchase within WFP are pale compared to those of PL 480.) Nevertheless, local purchase in the context of triangular trade, such as commodities purchased from Zimbabwe for distribution to bordering food deficit countries in Southern Africa, represents a good model for viewing Nepal. It is not too far from reality that the potential for food surpluses in the Terai, and its geographical separation from the Hills and Mountains, make these regions almost distinct economically if not politically. USAID and other donors should recognize this dichotomy. They should support through the CFA, the local purchase of food commodities by WFP in Nepal. This will not only reduce the economic costs of food assistance, but will also provide greater incentives to stimulate the stagnant agricultural economy in the country.

MONETIZATION

The monetization of food aid is an idea in good standing among many food aid critics and proponents alike. This simply involves the re-sale of donated food commodities in the recipient country. The proceeds from the sale are in turn used for specific and prescribed purposes. These may include such diverse endeavors as wages, purchase of materials and complementary inputs for food-for-work schemes, and payment of skilled and semi-skilled workers.

Monetization is practiced in a very limited fashion by WFP in Nepal. The Salt Trading Companies is given a small percentage of WFP wheat which they in turn sell. The proceeds then go to WFP. Globally, it is accepted much more readily by WFP than the corresponding PL 480 Title II Program. The question of importance for Nepal is whether greater monetization under WFP, or beginning a PL 480 program in which monetization was a key element, holds any promise for improving the effectiveness of project food aid in Nepal.

In the present WFP project, a serious constraint to project success has been the exorbitant costs of inland transportation and handling. These costs may represent three to five times the initial commodity value. WFP has received permission from headquarters to pay one-half of these domestically incurred costs. The remainder still represents too great of a burden for HMG to absorb. One possible solution to this problem is monetizing some of the food aid presently shipped by WFP.

In a similar vein, a previous WFP Evaluation Mission and interviews with field personnel indicate that shortages of the most basic equipment such as hand tools for road construction remains a problem. Thus, any monetization effect which generates needed cash to cover transport and complementary project inputs clearly has its merits.

All of this is well in theory. But in practice, it requires a government institution capable of handling the food aid and assuming responsibility for the re-sale process. In Nepal, this agency would seemingly be the NFC, but as mentioned above, HMG has employed the Salt Trading Company for this purpose in regard to WFP commodities. There is no clear reason that HMG did not choose the NFC for this task. It possibly reflects that the NFC has not been effective as a food distribution agency. If sales have tended to benefit the rich and politically astute who receive commodities at highly concessional rates. Given the necessity for monetizing food aid at its full market value, NFC may not be the appropriate agency.

Consequent to the need to exact a maximum return for monetized commodities, it would be necessary to sell food aid in areas that are not remote. Transport and handling charges would wipe out the proceeds from the sale in remote regions. This would rule out sales in most food deficit areas. Given the difficulty in maintaining reasonable price incentives to farmers in Nepal, especially in the food surplus areas of the Terai, it seems likely that a monetization program of any magnitude would only aggravate an already unacceptable situation. As mentioned earlier, infusions of aid into areas where there is a marked rise in demand due to a public works scheme is sound, but offering large quantities of imported commodities in markets that already suffer from low prices to producers is not advised. If there is a need for working capital in connection with food aid projects, it is best that that is provided directly, rather than raising it by once again implicitly taxing the farmers.

There remains, however, one creative solution. The cost of internal transport could be borne by WFP through paying porters in-kind --allowing them to take a portion of the commodities they have transported. The use of food as payment to porters would circumvent another agency being involved in selling food aid for cash, which are then used for portage. We have heard that in fact this practice has already been adopted in parts of Nepal. Its major drawback is that up to 80 percent of the commodities are expended as wages to porters. This comes as no surprise considering the transport problems in the country. Nevertheless, HMG can hardly afford to even pay half such transport costs at present. Donors should not seriously consider increases in the food aid commitments without commensurate financing of the transportation and storage costs, a point discussed below in more detail.

LOCAL COSTS OF FOOD AID ACTIVITIES

HMG, like many other developing countries, is confronting serious budgetary limitations. As a result, there is only limited potential for HMG to assume an increase in financial support for present food aid programs, let alone any new projects which are being considered. Nevertheless, there is considerable scope for it to assume a bigger role in planning, managing and coordinating development activities being implemented with the use of food aid. Intentions in this regard are revealed in the Comprehensive Master Plan for Improved Food Supply which recognizes that "international food-for-work is crucial for the implementation of the plan."¹² In the same document HMG suggests that food-for-work through WFP (and other donors) will "support infrastructure development aimed at increasing food consumption among small-farm families," through irrigation schemes, roads, and other local infrastructure projects. Similarly, another recent document¹³ of the National Food Strategy to Increase Food Supply states that food-for-work projects are viewed as needing improved targeting. This involves making sure that FFW, like the activities of NFC, are not as subject to influences of local politics. Specifically, it is implied that FFW

¹² Ministry of Supply, "A Comprehensive Master Plan for Improved Food Supply in Nepal," Working Draft, Kathmandu, November 7, 1983.

¹³ "Improved Food Supply Project," Unpublished Mimeograph, Kathmandu, November 5, 1984.

will be integrated into the overall process of providing "food production grants" to the District Assemblies, through the District Panchayat. These grants are designed to increase food production and will be additional to normal development grants given by the government.

This is considered an encouraging step forward. It may partially address the many problems that we heard identified concerning how present food aid projects suffer from political whims or poor planning. The result has been that roads are sited in inappropriate places, or are not well-integrated into an overall master roadway plan. In any event, it is encouraging to note the importance ascribed to FFW by government planners in their food strategy formulation.

Despite priority being given the use of food aid by HMG, the fact remains that they are presently overburdened by the inland transportation and storage costs for WFP commodities. They repeatedly request WFP to assume a greater share of these burdens. This is despite that WFP already provides reimbursement to HMG for 50 percent of the expenses incurred for inland transportation, storage and handling. Consequently, there is considerable evidence from WFP missions, and discussions with project personnel, that HMG has not been able to provide the necessary support for projects. This includes essentials such as hand tools, or timely arrivals of foodgrains to the project site. Furthermore, HMG officials readily admit the need for further, not less foreign assistance for the support costs of various existing food aid projects in Nepal.

It is therefore apparent that HMG will not be in a position to assume a significantly greater portion of the financial costs of food aid projects. Therefore, any program expansion in the next few years will have to be accompanied by creative ways of deferring the non-food related costs.

Finally, we discuss a remaining issue concerning possibility of increasing HMG's food aid activities, either through using indigenous foodcrops or expanding their financial support for existing programs. As intimated in previous sections, the availability of food in Nepal is not the constraint to using indigenous commodities. Rather, it is the lack of ability, due to both financial, management, and logistical constraints to procure foodgrains. Donor assistance in term of defending a floor price to farmers would be extremely valuable. Both money to help underwrite such an enterprise as well as technical assistance are required. The food stocks, thereafter, could be used partially to finance food-for-work activities, thereby serving two purposes simultaneously: providing incentives to farmers, and jobs to the unemployed.

Another dimension to this issue, however, is that the NFC is already engaged in what could be considered as an internal food aid program, as discussed in the previous section. Presently it is a prohibitively costly endeavor which demands reformulation. If proper care were taken to target those resources wisely, and for developmental rather than political purposes, one can conceive of a rather large domestic public works and infrastructure development program. Such a scheme could be modeled, for example, on the Maharashtra Employment Guarantee Scheme in India. Nevertheless, a major political commitment is required for the government to redirect the NFC food distribution scheme toward useful purposes. The need for donor support in designing worthwhile projects and providing supervision and complementary resources in this regard would be worthwhile. Before USAID gives any further attention to beginning its own Title II Program, they should explore ways to assist HMG to reform on the present internal food distribution scheme turning it into a meaningful development activity.

FOOD AID AND STABILIZATION POLICIES

The stabilization of food supply, demand, and prices is the central dimension of household food security. A variety of methods to achieve these goals potentially include a role for food aid, while others do not. These are the subject of this subsection.

Buffer stock operations have been advocated as a means of stabilizing food supplies and thus prices. The stock requirements for smoothing out supply fluctuations are a function of a number of factors. These include the size of the difference in supplies between years of plenty and lean production years, and the band of supply and price variation that is considered acceptable.

The major commitment of donors to expanding the storage facilities for food grains in Nepal is a clear manifestation of the priority accorded this enterprise. Despite the importance of these storage facilities, especially if a minimum support price scheme is initiated which will require extensive farm level procurement, we question the viability and appropriateness of further investments in buffer stock operations to stabilize supplies, let alone prices. Experience has shown that eliminating supply instability through buffer stock operations can be extremely expensive especially for small countries. This is due to the costs of holding in storage large

quantities of grains over a number of years or large storage facilities underutilized in other years. Furthermore, even if storage capacity is geared to expected and usual supply variations, stocks may be quickly used up in periods of acute shortfalls, such as two or more lean years occurring consecutively. This coupled with the fact that there is marked diminishing marginal effectiveness of buffer stock operations, commensurate with marginal cost increases as the size of buffer stock operations rise, suggests that USAID should not give emphasis to the construction of further storage facilities. Furthermore, we do not see any role for food aid in assisting in supply stabilization through buffer stock operation. Local procurement, not food aid, should be employed to build up needed reserves.

A complementary strategy to stabilizing supplies and prices using buffer stocks is to use trade opportunities, both with India and other international markets to sell off surpluses in good years and make purchases when domestic supplies are short. We believe that given Nepal's circumstance of a vast open border with India, greater stability in food supplies can be effectively achieved through exploiting Indian food policy and international markets. Concerning the former, the fact is that India's massive reserves undoubtedly afford a degree of stability to foodgrain supplies in Nepal. If prices increase dramatically in the Terai, Indian traders will undoubtedly engage in spatial arbitrage. Allowing the private sector traders to assume these costs, and only employing government reserves at the margin is strongly advocated. This, coupled with the recognition of the ability to purchase commodities in international markets or receive food aid in years of crop failure, is considered a necessary complement to buffer stock operations. While these matters are clearly in need of further study, we believe that the major role of food aid in this process of supply stabilization is mediated through trade policy.

Finally, and more importantly, the role of food aid in stabilizing demand should be the focal point of donor concerns. Stabilizing supplies in the face of shifting demand will do little to promote household food security. Demand may prove highly erratic, even if a buffer operation stabilizes the supply environment. Buffer stocks can maintain a stable supply and even price environment. However, given that income in Nepal is largely from agricultural production, demand may still fluctuate precipitously in years of poor harvests. Thus, in a country where income from

agriculture and primary products is of central importance, one must go beyond supply stabilization and consider stabilizing demand. It is in regard to stabilizing random fluctuations in output, and thus incomes and demand, that food aid can be an effective tool.

Using food aid to stabilize incomes requires reformulation of present programming strategies and objectives. First, it would require determining yearly food aid levels on the basis of the fluctuations in supply and incomes. The role of food aid would have to be expanded beyond being only a component of the normal flow of development aid. Rather than determining food aid levels solely on the basis of financing development projects, flexible agreements would be required whereby large infusions of aid would be needed in year of low production, and just the opposite in highly productive years. It is acknowledged that such a formula is difficult both from an administrative and political viewpoint. Donors are unlikely to allow the flow of food aid to have dramatic variations in accordance with transitory food security problems. This would be contradictory to their own political and surplus disposal objectives. Similarly, the administrative requirements to adopt flexible food aid flows in Nepal would be difficult, and probably beyond the capacity either of WFP or Title II programs as presently conceived. Nevertheless, we urge that WFP consider the potential for greater flexibility in commitments in accordance with yearly production and income fluctuations. This could be considered as an activity over and above a base level of "developmental" assistance.

CONCLUSIONS AND RECOMMENDATIONS

The major purpose of this assessment was to explore the appropriateness of food aid as a form of development assistance to increase the pace of agricultural development in Nepal. The impetus for such an inquiry was the need to respond to a request by HMG for USAID/Nepal to initiate a bilateral food aid program.

It is our conclusion that food assistance in the form of food-for-work projects is merited in Nepal, much more so than in many other countries in the world. The pre-conditions for the use of food aid in public works projects high levels of under employment and large food deficit areas not well integrated with other markets are easily discernible features of the economic landscape in Nepal. This, coupled with the seriousness of health and nutrition problems, and the limited resources of HMG for reaching food deficit areas due to the difficult geography of the country, commend the use of whatever outside resources can be obtained to tackle basic human needs problems and the unparalleled lack of infrastructure in the country.

Despite the sound reasoning behind the concept of food-for-work in Nepal, we are equally convinced that the time is not right for a bilateral food aid program. Furthermore any such step in the future should be taken with the utmost caution and consideration. Our reasons are manifold, and must be understood in the broader context of development assistance to Nepal.

To amplify, there are four main reasons for our reluctance to recommend a bilateral food aid program in Nepal. First; food aid is only as effective as the design, management and execution of the projects in which it is employed. Food-for-work is never a neutral undertaking. Rather, it is conditioned by a constellation of factors revolving around whether it is integrated into a sound agricultural development strategy, and a framework that favors farmers. In those instances where macroeconomic policies are biased against agriculture, food aid usually serves to reinforce such an adverse policy bias. Conversely, in instances where the necessary measures such as price incentives, availability of credit, and improved technology have been undertaken to promote agricultural development, food-for-work can represent a vital resource in supporting such a program.

It seems clear that the faltering agricultural economy in Nepal, discussed in the first section of this report, is largely due to policies which

implicitly are biased against farmers. In such an environment, the provision of food assistance is seen at best as being less constructive than it could be, and at worst, supporting such misguided policies. For example, the earlier discussion illustrated that people stopped working on food-aid funded activities because the price fell so markedly in the local wheat market. Food aid was ineffectual. Similarly, one can only conclude that supplying free wheat in large quantities to a country where the government is unwilling or unable to support their own farmers growing the same commodity is a problem which needs to be remedied.

The second major reason for cautioning against instituting a bilateral food aid project concerns the perception of the limited absorptive capacity of HMG. Food aid never stands alone. It must always be accompanied by significant budgetary outlays which can equal and usually need to be in excess of the food aid itself. These financial resources are necessary to supplement food rations with cash wages, to purchase necessary tools and equipment, and to pay skilled workers and managers. In addition, the soundness of the planning projects, and the ability to execute those schemes, are all fundamental aspects of food-for-work, and planning and management expertise also has a significant price tag. This is especially so in Nepal where food deficit areas are remote. The costs incurred for transportation, handling and storage, to say nothing of all the other project specific expenses, often are two to five times the value of the food aid itself. Thus the question arises as to who pays. Unquestionably, one of the biggest problems which accompanies PL 480 Title II programs globally is that the food comes with too little financial aid attached. Since many in Washington do not view food as a whole-costed resource, an attitude which we find unfortunate, it is often programmed without the serious consideration and scrutiny that would go into financial aid. In the case where the local government can absorb the food aid and help program it successfully, this is not a serious problem. However, we feel that in Nepal, even if USAID were to initiate a free food program, HMG does not have the resources to use it effectively. They are struggling already with the costs of moving and using effectively the food provided by WFP; transport and purchase of even the most basic hand tools for food aid projects already underway is a serious problem.

The third and fourth reasons for discouraging the USAID Mission in Nepal from embarking on a bilateral food aid program are intertwined. The

third recognizes the major administrative burden of monitoring the use of the food in Nepal, and the need to find a PVO interested in using food as part of their activities. The fourth acknowledges that there is already a large multilateral food aid program run by the World Food Programme. While this is not the place to argue the merits of bilateral versus multi-lateral aid, or the relative advantages of the World Food Programme versus the Food-For-Peace Program, there are certain realities worth recognizing.

The first of these realities is that the WFP has ample food resources available for programming in Nepal. If well designed projects were developed, there is every reason to expect Rome to be forthcoming with an increase in food allocations. Given our conclusion that food aid in Nepal suffers from inadequate programming, it would seem more promising to explore modes of cooperation between USAID financed development projects and the World Food Programme. The second reality, that food aid projects are not now integrated sufficiently with broader development activities, represents a real potential, when appropriate, for complementing present and future USAID funded activities with food assistance through the World Food Programme, without commencing a new PL 480 effort. The long experience of WFP, coupled with the third reality that it should be almost as easy for USAID to co-sponsor projects with WFP as between a PL 480 office and other offices within USAID, commends building upon existing donor activities.

Given these general remarks, our specific recommendations are presented below.

1. Greater care needs to be taken to assure that food-for-work projects are only installed in food deficit areas with high levels of underemployed labor.
2. Food-for-work projects should be integrated with other development projects to exploit the technical support and complementary resources available from capital development and other dollar funded assistance.
3. Partial payment of wages should always be in the form of cash. This should amount to at least 20 percent of the total wage.
4. Ideally, all wages should be in the form of cash. Food aid should then be available for purchase by workers in food deficit regions, in some sort of ration shop. The funds generated from such sales could then be re-integrated into the project itself.

5. Greater effort should be made to link food-for-work wages to local wages. This will help reduce the likelihood of drawing people from other productive areas of endeavor, and simultaneously avoid the problem of no one coming to work at the project site.
6. Rather than begin a PL 480 Title II program in Nepal, USAID should explore direct cooperation with WFP on projects for which a food aid component is concluded to be appropriate. This will both help WFP use their resources in more developmentally sound activities, while allowing USAID to enjoy and take advantage of additional food resources in the proper circumstances, without all the bureaucratic strain of a bilateral effort.
7. Monetization of food aid holds little promise in Nepal. It may in fact further depress prices paid for local commodities, as there is not a government mechanism capable of handling the food in such a way as to preclude disincentive effects.
8. Consideration should be given to legalizing the defacto paying of porters in kind for carrying the food aid to remote project areas. This will help defer a major financial burden on HMG which is charged with the cost of inland transportation and handling. Use of porters increases employment and is preferable for that reason to high cost air transportation.
9. Greater care must be made in the selection of food commodities for food aid programs. But more importantly, given the exorbitant cost of inland transportation in Nepal, commodities should be selected which have the highest value to the recipient, as reflected in the local price of the food, in relation to the transport cost of the commodity.
10. All efforts should be made to allow local purchases of food commodities for food aid projects. Rather than USAID developing a bilateral food aid program, consideration should be given to assisting HMG to develop and finance an effective price support scheme. A portion of the commodities procured could thereafter be integrated into a targeted internal food aid program in which the NFC could provide food as partial wages in USAID financed projects, thus defraying some of the operating costs of those projects.

11. USAID should consider providing technical assistance to NFC and other agencies to develop an effective price support scheme, although the Asian Development Bank has taken the lead role in encouraging an improved price support system. Further technical assistance funded by USAID to improve internal food subsidizing and distribution activities, including targeted food-for-work projects, would greatly enhance the developmental impacts of programs operated by HMG. Support prices differentiated by area are needed to encourage production in deficit areas.
12. There is undoubtedly need to increase food reserves in the form of buffer stocks. The World Bank and ODA projects for the construction of godowns have assured adequate primary storage facilities in Nepal. However, commodities to fill these facilities should be procured domestically rather than from food aid.
13. The major role of food aid in terms of stabilization policy should be in terms of reducing yearly fluctuations in demand, rather than supplies and prices. This would require the adoption of the concept of flexible food aid flows. In years in which incomes and demand declines due to factors such as a poor harvest, it is necessary to go beyond supply stabilization to ensure household food security. Therefore, provision should be made for increasing or decreasing food aid flows on a yearly level, over and above the normal quantity of development aid committed to specific infrastructure and asset development.
14. There are a number of food policy issues we consider to need further research. Briefly, these are as follows:
 - a. Factors effecting production response in areas where improved market is provided through road construction and the like, which result from projects such as the construction of the Jiri Road.
 - b. Consumption effects of the NFC subsidized food distribution program, and how it can be better targeted to food deficit population groups.
 - c. An analysis of the long-term implications for national growth and development of the current strategy of promoting food self-sufficiency in food deficit areas of the Hills and Mountains. This should be an adjunct to HMG's National Food Supply Strategy, whose development is being supported by FAO.

15. Given that it would be more cost-effective to transport a ton of chemical fertilizer rather than a ton of foodgrain, HMG should investigate the possibilities of using some of the funds now spent for the food subsidy scheme to expand fertilizer supply and distribution in the Hills.
16. In coordination with FAO, provide timely technical assistance to extend the formulation and implementation of the new national food and agriculture strategy, especially as regards policy priorities. It is important that the strategy analyze the long-term development prospects of the major zones, considering the interaction of the Terai with the Hills and Mountains. Possibilities for crops and livestock other than foodgrains, as well as growth center based on non-farm activities, should be considered to raise incomes in the hill regions.
17. USAID should encourage improvements in the data base. In particular, information on household production, income, and consumption is needed to better understand the food situation and clarify food needs and deficits. Household surveys can provide this data base.
18. Improved targeting of domestic food subsidies is needed. Use of parboiled rice (cheaper and consumed by low-income families) in the Kathmandu Valley is an example. An effective price support program for maize, millet and barley in the Hills/Mountains with sales at subsidized prices would both encourage production and target poor households better than is done by the current large subsidies on rice and wheat.
19. USAID should intensify its policy dialogue with HMG on agricultural pricing and overall market intervention policies. The effectiveness of the dialogue would be enhanced by a systematic survey of evidence, impacts, issues, and alternatives. USAID should carry out such an analytical survey as a means for encouraging policy reforms by HMG.

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APPENDIX

Persons Contacted by the Food Aid Assessment Team

Persons Contacted in Kathmandu

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2. Dr. Janet C. Ballantyne
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3. Dr. Charles T. Hash
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4. Mr. George F. Taylor
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5. Mr. N.M.S. Reguri
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Office of Agriculture and Resource Conservation
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6. Dr. Carl A. Dutto
Rural Development Officer
Office of Rural Area Development
AID/Nepal
7. Dr. John C. Cool
ADC Associate
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8. Mr. M.T. Balke
WFP Deputy Representative
WFP, UNDP
9. Mr. Kevin Farrell
WFP
10. Dr. George Axinn
FAO Representative, FAO
11. Mr. Toshiguki Nirva
Resident Representative, UNDP
12. Mr. Ram Prashad Joshi
Deputy General Manager
National Food Corporation
13. Mr. Tilak Rawal and other Economists
APROSC
14. Dr. Jagadish Beral
Executive Director, APROSC

15. Mr. Shri Krishna Upadhyaya
General Manager
Agriculture Development Bank
16. Mr. Bihari Krishna Shresth
Coordinator, National Food Strategy
National Planning Commission
17. Mr. S. Bahadur Senowli
General Manager
Nepal Food Corporation
18. Mr. Santa Bahadur Rai
Secretary
Ministry of Supplies
19. Mr. madan Bahadur Shrertha
Food and Agriculture Marketing Service Department
Ministry of Agriculture
20. Mr. Alfred Frirchbnecht
Director, SATA
21. Dr. D.R. Pandey
Director, IDS
22. Mr. Jan Jansonias
FAO Crop Forecasting and Early Warning Project
FAMSD
23. Project Engineer
SATA
24. Bad Bahadur Khadha
Joint Member
National Planning Commission

Persons Contacted During Field Trip to Nepalgunj and Jumla

1. Mr. Upendra Jung Thapa
Nepal Food Corporation
2. Mr. Gyan Bahadur Khatri
Zonal Manager,
Bheri Zone, N.F.C.
3. Mr. Jaya Dev Bhatt
Zonal Manager
Nepal Oil Corporation
4. Mr. Shanta Lal Kabadia
Private Trader (Miller)
5. Mill visited:
Ganesh Himal
Rice, Flour Oil and Dal Mill
6. Mr. Ram Bahadur Malla
Chief Sub Branch
Jumla, N.F.C.
7. Mr. Jagadish Khadka
Zonal Commissioner
Jumla
8. Mr. Ramananda Mishra
Chief District Officer
Jumla
9. Mr. Mahesh Raj Giri
Agriculture Development Officer
Jumla
10. Mr. Kokil Mani Kafle
Public Relations Officer
Jumla