

GENESYS

71099

Special Studies No. 2

The Role of Women in Evolving Agricultural Economies of Asia and the Near East: Implications for A.I.D.'s Strategic Planning

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Prepared for the U.S. Agency
for International Development conference:

Women, Economic Growth and Demographic Change in Asia, the Near East and Eastern Europe

May 14-15, 1991

Washington, D.C.

**THE ROLE OF WOMEN IN EVOLVING AGRICULTURAL ECONOMIES OF ASIA
AND THE NEAR EAST: IMPLICATIONS FOR A.I.D.'s STRATEGIC PLANNING**

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Prepared for:

**Office of Technical Resources
Bureau for Asia and the Near East**

**Office of Women in Development
Bureau for Policy and Program Coordination**

U.S. Agency for International Development

Contract No. PDC-0100-Z-00-9044-00

The views and interpretations expressed in this report are those of the authors and should not be attributed to the Agency for International Development.

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EXECUTIVE SUMMARY

The regional agricultural strategy formulated by A.I.D.'s former Bureau for Asia and the Near East (ANE)* clearly recognizes the need to consider gender issues in meeting its three key objectives: **increased income, increased food availability, and enhancement of the natural resource base.** In providing programmatic guidance, the strategy identifies priorities based on an economy's level of structural transformation, as indicated by per capita GNP and shares of GDP in agriculture and industry. The ANE countries are thus formed into three groupings:

(i) **Low-income agricultural economies** (Bangladesh, Nepal), with per capita incomes of less than \$250 per year and shares of GDP in agriculture over 50% and in industry less than 20%;

(ii) **Middle-income transitional economies** (Egypt, India, Indonesia, Pakistan, Philippines, Sri Lanka, Yemen A.R.) with per capita incomes of \$250-\$750, and agriculture's share of GDP less than 35% and industry's over 25%;

(iii) **Middle-income industrializing economies** (Jordan, Oman, Thailand, Morocco[§], Tunisia) with per capita incomes of over \$750, and agriculture's share of GDP less than 20% and industry's over 30%.

This report examines a number of dynamic characteristics of economic growth and transformation within ANE countries that are described in the strategy, focusing on those that pertain most directly to the differential contributions of women and men. It then discusses implications of associated conditions and experiences for achieving objectives within five of the seven strategic program emphases: **agribusiness development, natural resources management, agricultural planning and analysis, infrastructure management, and trade and market development.** It concludes that investing specifically in women is not only more likely to achieve food systems growth objectives, but is also more likely to engender greater positive benefits than similar investments in boys and men. Agricultural and environmental interventions offer a unique opportunity to promote women's participation by identifying and overcoming constraints to their productivity, employment opportunities and earnings. Finally, recommendations are offered to A.I.D. Missions for promoting sustainable agricultural development and economic growth that actively incorporate the analysis of gender issues and recognize the central role of women in a food systems strategy.

GENDER DIFFERENCES IN AGRICULTURE IN ASIA AND THE NEAR EAST

The proportion of the labor force engaged in agriculture in ANE countries ranges from 10% in Jordan to over 90% in Nepal. There is substantial variation within the region in the sex composition of the farm work force. According to ILO estimates for 1980, proportions of girls and women among all farm workers (paid and unpaid) range from under 5% in Egypt, Jordan and Oman to 30% or more in Nepal, India and Indonesia, and nearly 50% in Thailand. Enumeration methods for the female agricultural labor force are highly suspect in several countries, however, and wide disparities arise depending on the type of survey or estimate used. In non-agricultural sectors, the situation is similar, with women's share of employment (formal and non-formal) ranging from about

* Since that time, the Agency has reorganized and countries formerly under the ANE Bureau have been divided between two other bureaus. These are the Bureau for Europe and Near East and the Asia Private Enterprise Bureau.

§ Although Morocco is included in the Middle-Income Transitional group in the ANE strategy, it has been included with the industrializing economies here because of recent changes in GNP per capita and sectoral distribution of GDP.

10% in Bangladesh, Pakistan, Egypt, Jordan and Oman, to over 40% in the Philippines and Thailand.

Variations in female labor force participation in the agricultural and non-agricultural sectors are not related linearly to the degree of structural transformation. Rather, they are primarily a function of interactions between: (1) the degree of cultural restriction on female mobility, which affects the supply of female labor; (2) the type of primary crops and livestock raised and associated labor requirements; (3) the use of irrigation and mechanization, which absorbs or displaces male and female labor to differing degrees; and (4) the nature of demand for male and female labor outside agriculture (including domestic requirements) in both rural and urban areas, which competes with agricultural work and may provoke seasonal or permanent migration flows.

Male migration out of rural areas is apparently not related to rising agricultural productivity either; rather, the data suggest that men are most likely to leave the least productive areas for work in urban areas or abroad, or seasonal work in more prosperous agricultural regions. As a consequence, women are generally most involved in farm work where productivity is lowest. Predominantly male migration to cities prevails throughout the South Asian countries, while female migrants outnumber males in the Philippines and Thailand. The remaining countries show only slight differences in the ratios of adult males to females in rural and urban areas, suggesting that men do not substantially outnumber women in rural-to-urban migration streams at the national level.

Migration flows, female labor force participation and the sexual division of labor in agriculture vary substantially across regions within a country and across the different classes or castes within its population. The division of agricultural labor by gender is quite rigid throughout much of the region, even though what is considered "women's work" in some areas may indeed be "men's work" in others and vice versa. Similarly, tasks performed largely by family labor in one setting may be done by hired workers in another. Women often specialize in seed selection, weeding, transplanting, preparation and application of organic fertilizer, post-harvest processing, and maintenance of small livestock and poultry. Men tend to specialize in land preparation, planting and harvesting, care of large animals, and tasks involving modern technologies or inputs. In some areas, however, men and women do the same work almost interchangeably, most notably in Thailand. Individual country studies reveal the diversity and dynamism of these patterns within and across countries in the ANE region.

THE IMPORTANCE OF GENDER IN ACHIEVING STRATEGY OBJECTIVES

According to the ANE Food Systems Strategy, the major development objectives for the low-income agricultural economies are to increase basic cereals production and improve the efficiency and effectiveness of the required support services. For middle-income transitional economies, key objectives are to maintain sustained growth in cereals production and to expand the industrial sector, especially through the development of agro-processing as an additional source of rural income and employment. For middle-income industrializing economies, the Strategy objectives are to assist domestic institutions in the agricultural sector to be self-sustaining and linked with domestic and international research networks.

Policies such as these that appear on their surface to be "gender-neutral" rarely turn out to be gender-neutral in their implementation or outcomes; rather, they almost always affect men and women differently in terms of employment opportunities, labor inputs and returns, and productivity. Knowledge of the varied and changing patterns of the gender-based division of labor within the agricultural and non-agricultural sectors of each country is essential to understanding the nature of resource use and of agricultural production, processing and marketing, including the constraints to

increased productivity and hence the impacts of various interventions. Investment in agricultural development or natural resources management will in most cases require careful analysis of the organization of labor by age, gender, landholding status, and other characteristics, as a basis for choosing appropriate interventions.

The ANE agricultural strategy identifies seven "program emphases" or "primary investment opportunities" for attaining its development objectives: **agribusiness development, natural resources management, agricultural planning and analysis, infrastructure management, agricultural technology development and management, trade and market development, and institutional and human capital development.** Where the emphasis should be placed in any given country depends on its process of structural transformation, along with other characteristics such as its natural resource endowments, educational level of the workforce, and the degree of infrastructural development. Each of the seven program emphases carries important implications for women's roles and contributions. Depending on which strategic priorities are emphasized, certain aspects of women's roles in agriculture and overall development must be understood in order to maximize their contributions to growth and facilitate the transformation process while minimizing the adverse impacts of economic adjustment.

The report provides a number of detailed recommendations within several program emphasis areas. Although specific recommendations should be tailored to the unique conditions of each country, several general points can be summarized here:

1. **The development of agribusiness enterprises through the creation of forward and backward linkages to the production process holds great promise for employing women workers and raising their productivity and incomes, if it is carefully planned to achieve these objectives. The rising female presence in manufacturing in many ANE countries attests to the availability of female labor pools for these purposes.**
2. **The success of natural resource management programs depends heavily on women's participation because of women's special roles in collecting fuel, water, wild foods and medicines, and animal fodder, their specific crop-tending responsibilities, and their reliance on forest products as a source of income.**
3. **Agricultural planning and analysis in ANE countries should include a clearly defined gender component as an aid to understanding the linkages between macro-policy issues and the productivity, security, and well-being of women in landless and cultivator households.**
4. **Investments in rural infrastructures such as roads, markets, and irrigation systems that take women's specialized needs into account can significantly improve women's access to such infrastructures, and thus, their productivity and incomes.**
5. **The design of new production-enhancing technologies must take into account the needs and capacities of women workers and the decision-making roles of women in farm management.**

Many subsectors in which female labor predominates, such as homestead agriculture, livestock, poultry, and agro-processing have high growth potential but do not receive adequate policy and program support. There is enormous scope for supporting these undervalued activities through new programming efforts. Investments that explicitly take account of women's current or potential contributions can also produce impressive results in fisheries and forestry enterprises, irrigation and water resources, environmental protection and restoration, small industries and microenterprises, rural institution building, and infrastructure development. What is needed most is a genuine commitment

to making women's equal participation a reality in the planning and implementation of policies and programs.

Recommendations need to be adapted to the particular circumstances of each country. Priorities will differ depending on structural and social conditions, state policies, the nature of domestic and international trade and markets, environmental and agricultural potential, and other considerations. The major point to be stressed is that all aspects of A.I.D. program and project identification, planning, implementation, and assessment in the region should actively be directed toward specific investments in women's productivity and earnings. In this way, the Agency can improve women's contributions to and benefits from food systems growth. Working in a gender-neutral framework is simply not sufficient to accomplish the full range of program objectives. Planning for agricultural growth in the 1990s offers a major challenge to A.I.D. to engage in innovative and path-breaking support for women in agriculture and for growth which taps women's full productive potential.

INTRODUCTION

In February 1990, The Agriculture and Rural Development Division of A.I.D.'s Bureau for Asia and the Near East (ANE)* released its regional agricultural strategy entitled *Meeting the Challenge: A Food Systems Strategy for Growth in the 1990's*. This strategy provides programmatic guidance for implementing three key objectives: **increased income, increased food availability, and enhancement of the natural resource base**. It suggests a set of guidelines for making resource allocation decisions based upon the country's past growth performance and the historic transformation of agriculture and its relationship to economic growth in the Asia/Near East region. It also draws attention to factors beyond the scope of traditional agricultural development, including trade, agribusiness and off-farm employment, natural resource conservation, and gender issues. The last of these is critical to meeting all three key objectives; implementation of the strategy must take into account differences in women's and men's roles in specific country contexts, and their distinct contributions to agricultural production and economic growth. Women as well as men experience the effects of structural transformation of the agricultural sector as it modernizes and takes on an increasingly outward-oriented character. Women may be key contributors to the success of this transformation and share in its prosperity, or they may become obstacles to the process and the victims of its failure.

The strategy groups the fifteen ANE client countries according to per capita income and the share of GDP contributed by agriculture and industry. The three groupings are:

- (i) **Low-income agricultural economies** (Bangladesh, Burma[‡], Nepal), with per capita incomes of less than \$250 per year and shares of GDP in agriculture over 50% and in industry less than 20%;
- (ii) **Middle-income transitional economies** (Egypt, India, Indonesia, Morocco, Pakistan, Philippines, Sri Lanka, Yemen A.R.) with per capita incomes of \$250-\$750, and agriculture's share of GDP less than 35% and industry's over 25%;
- (iii) **Middle-income industrializing economies** (Jordan, Oman, Thailand, Tunisia) with per capita incomes of over \$750, and agriculture's share of GDP less than 20% and industry's over 30%.

Classifications of countries in the strategy are based on 1985 data. More recent indicators from 1988 modify the classifications slightly, as shown in Table 1. For low-income agricultural

* Since that time, the Agency has reorganized and countries formerly under the ANE Bureau have been divided between two other bureaus. These are the Bureau for Europe and Near East and the Asia Private Enterprise Bureau.

[‡] Burma, now Myanmar, no longer hosts USAID activities, and is therefore not considered in subsequent discussions.

economies, agriculture now contributes over 40% of GDP, not 50%. For middle-income transitional economies, industry contributes over 20% of GDP, not 25%. The Arab Republic of Yemen and the Democratic People's Republic of Yemen are combined in this table to reflect their new status as one country. The middle-income industrializing group now includes Morocco, because of its higher GNP per capita and industrial production. Industry contributes 25% or more of total GNP among countries in this group.

The ANE countries are rank ordered in Table 1 according to the percentage of GDP derived from agriculture in 1988, which ranges from 56% in Nepal to only 3% in Oman. The value of production per agricultural worker provides a very rough indicator of labor productivity and intensity, ranging from \$281 in Nepal to \$5909 in Jordan. The importance of agricultural exports is revealed by their share of total exports, which ranges from only 2% in Yemen and Oman to 50% in Sri Lanka. Finally, export orientation within the agricultural sector, which is indicated by the value of agricultural exports as a percentage of total agricultural production, is close to nil in Indonesia, Yemen and Tunisia, while Sri Lanka and Thailand export over 30% of agricultural production (in value terms).

The strategy also describes major agricultural and economic changes that have occurred in the ANE region over the past two decades:

The normal development path starts with the introduction of new, high-yielding cereal varieties complemented by improved rural infrastructure (roads and irrigation) and supportive government input and output price policies. Productivity increases in the basic cereals and the associated grain surpluses find their way into other sectors through lower real food prices and increases in the demand for manufactured goods and services which result from higher agriculture incomes. As yield increases begin to slow, labor (particularly better educated, young labor) begins to move out of agriculture and into faster growing sectors. Higher urban and rural incomes, which continue to be supported by low food prices, increase rural demand for manufactured goods and lead to shifts in consumer demand away from basic cereals and toward processed and higher quality food. During this process the source of growth within the agriculture sector shifts from production to processing, marketing and transportation for domestic and export markets.

In addition, the strategy describes a few characteristics of this growth process which directly pertain to gender issues:

- As agricultural productivity increases rapidly and industries develop, there is a trend toward male migration out of rural areas, resulting in a greater proportion of women within the agricultural labor force.
- Rapid out-migration from marginal agricultural areas will result in medium- and long-term adjustments in cropping patterns that reflect more limited and predominantly female labor availability.

Table 1. Economic Indicators, Asia and the Near East, 1988.

Country	GNP/ capita	% of GDP in Agriculture	% of GDP in Industry	Ag. exports as % of all exports	Ag. exports as % of all ag. prodn.	Value of ag. prodn. per worker	Value of ag. exports per worker
Low-Income Agricultural Economies							
Nepal	\$ 180	56	17	29	1	\$ 281	\$ 9
Bangladesh	170	46	14	29	4	473	19
Middle-Income Transitional Economies							
India	\$ 340	32	30	18	1	\$ 412	\$ 14
Pakistan	350	26	24	30	8	638	94
Sri Lanka	420	26	27	50	32	571	253
Indonesia	440	24	36	22	**	621	134
Philippines	630	23	34	26	10	993	203
Yemen*	590	22	26	2	**	671	7
Egypt	660	21	25	10	6	1,398	87
Middle-Income Industrializing Economies							
Thailand	\$ 1,000	17	35	45	34	\$ 589	\$ 425
Morocco	830	17	34	29	28	1,441	405
Tunisia	1,230	14	32	17	**	1,834	610
Jordan	1,500	10	25	10	25	5,909	1,326
Oman	5,000	3	43	2	n.a.	1,746	563

* Democratic People's Republic of Yemen and Arab Republic of Yemen combined

** indicates less than 1%

Sources:

1. Per capita Gross National Product from World Bank (1990), Table 1.
2. Agriculture and Industry as percentage of GDP from World Bank (1990), Table 3.
3. Value of agricultural production per agricultural worker: numerator from World Bank (1990), Table 3; denominator from International Labor Office (1986), Table 3.
4. Exports of other primary commodities as a percentage of total exports calculated from World Bank (1990), Table 16. "Other primary commodities" (i.e. other than fuels, minerals and metals) include food, live animals, beverages, tobacco, inedible crude materials, oils, fats, and waxes.
5. Value of other primary commodities exports per agricultural worker: numerator calculated from World Bank (1990), Tables 14 and 16; denominator from ILO (1986), Table 3.
6. Agricultural exports as a percentage of total agricultural production calculated from World Bank (1989) country data.

- As the need for improved food processing and marketing systems increases, women may be especially affected because of their traditional roles in processing and vending.
- Much of the initial growth in agribusiness will be in the informal sector, where women play a prominent role.
- The expansion of agroprocessing and secondary support facilities can provide productive employment, particularly for women, as the labor absorption of primary agriculture declines.
- In countries which have experienced productivity gains from improved seeds, irrigation, and agrochemicals, continued yield increases will come about from better farm management practices, such as more effective irrigation, integrated pest management techniques, mixed organic-chemical fertilizers, and other environmentally sustainable methods; these will be more difficult and costlier to develop than previous interventions because they will be more area-specific, and will need to be adapted to the growing numbers of women farm managers.

The strategy document goes on to discuss constraints to future growth for each group of countries and provides investment options based on these constraints in seven program areas: agricultural technology development and management, natural resources management, agribusiness development, trade and market development, infrastructure management, agricultural planning and analysis, and institutional and human capital development. Finally, several recommendations are made for A.I.D. operations aimed at implementing the strategy.

The GENESYS Project was requested by ANE/TR/ARD to identify and elucidate gender-related issues raised in the strategy, as well as to provide recommendations for how these issues can be addressed in programs and policies intended to carry out the strategy. Therefore, preparation of this report has been guided by hypotheses and recommendations presented in the strategy document. The first section of the report provides an analysis of gender differences in agriculture in ANE client countries. It examines gender-related dynamics of agricultural modernization and economic growth and the degree to which countries have achieved the strategy objectives. The analysis concludes with a summary of the relationships between a country's stage of development and the kinds of female labor shifts that can be expected and assisted. Section II then discusses the importance of gender considerations in achieving strategy objectives within each of the seven strategic program emphases, followed by recommendations to A.I.D. Missions for promoting sustainable agricultural development and economic growth which incorporate the analysis of critical gender issues.

I. GENDER DIFFERENCES IN AGRICULTURE IN ASIA AND THE NEAR EAST

LA. Women's Economic Activity and Changing Roles in Agriculture

ILO estimates placed the total female population in Asia (including China) at 1.263 billion in 1980, of which 350 million were economically active. Asian women represent 20% of the world's labor force and over half the world's economically active female population. Nearly half (46%) of all women ages 15-64 belong to the paid labor force. This is the same percentage as the global average, and somewhat higher than the average for all developing regions (42%) (Sivard, 1985). There is great variation within the region, however. In North Africa, only 18% of women in the specified age group are "economically active"; in the Middle East, 25%; in South Asia, 36%; and in East and Southeast Asia, 53%.

Table 2 provides figures on female participation in the agricultural and nonagricultural labor force for the countries considered in the ANE strategy. It also shows the percentage of the total labor force employed in agriculture, and as a rough indicator of gender differences in migration, the ratio of males to females age ten and over in rural and urban areas.

The general movement of the labor force out of agriculture and into industry and services is described in the first column. The 14 countries are rank ordered from high to low according to the percentage of GDP derived from agriculture. The percentage of the total labor force employed in agriculture is not precisely parallel, however. For example, Yemen, Thailand and Oman have higher proportions employed in agriculture than one would expect on the basis of agriculture's contribution to GDP. In 1980, about 70% of Thailand's workers were in the agricultural sector and 50% of Oman's, despite their classification as middle-income industrializing economies based on GDP composition.

The substantial variation across ANE countries in the sex composition of the agricultural labor force is evident in column 3. According to ILO estimates for 1980, proportions of women among all farm workers range from under 5% in Egypt, Jordan and Oman to 30% or more in Nepal, India and Indonesia, and nearly 50% in Thailand. More recent evidence from population censuses or national labor force surveys reported in the *Yearbook of Labor Statistics* (YLS) generally reinforces these estimates, although the resulting female shares of the agricultural workforce are slightly lower than

Table 2. Characteristics of Agricultural and Nonagricultural Labor Force, Rural and Urban Sex Ratios, Asia and the Near East.

Country	(1)	(2)	(3)		(4)		(5)	
	Date & Source	Agricultural LF as percent of total LF	Agricultural LF total (000)	percent female	Nonagricultural LF total (000)	percent female	♂/♀ Sex ratios (age 10+) Rural Urban	
<u>Low-income agricultural economies</u>								
Nepal	1980/ILO	93	5,707	36	432	15	104	117
	1981/YLS	91	6,244	36	479	14		
Bangladesh	1980/ILO	75	18,802	6	6,331	7	106	135
	1981/YLS	60	16,429	1	11,175	19		
<u>Middle-Income Transitional Economies</u>								
India	1980/ILO	70	185,017	31	80,303	19	104	117
	1981/YLS	63	153,015	24	69,501	12		
Pakistan	1980/ILO	55	13,875	8	11,540	13	113	120
	1980/FAO	--	16,852	43	--	--	--	--
	1981/YLS	55	11,291	3	9,132	5		
Sri Lanka	1980/ILO	53	2,912	29	2,546	24	102	111
	1985/YLS	48	2,438	34	2,684	27		
Indonesia	1980/ILO	57	32,180	30	24,072	33	97	98
	1985/YLS	55	34,198	35	27,613	37		
Philippines	1971/FAO	--	11,954	30	--	--	--	--
	1987/YLS	47	9,858	25	10,936	46		
	1980/ILO	52	9,076	24	8,457	43	103	92
Yemen*	1980/ILO	66	2,225	10	1,205	16	n.a.	n.a.
	1977-83/FAO	--	1,759	48	--	--	106	--
Egypt	1980/ILO	46	5,158	4	6,139	13	103	106
	1984/YLS	40	4,719	21	7,116	16		

LF = Labor Force

* Democratic People's Republic of Yemen and Arab Republic of Yemen are combined in the ILO estimates for 1980. FAO agricultural census conducted only in the Arab Republic of Yemen.

Table 2. Characteristics of Agricultural and Nonagricultural Labor Force, Rural and Urban Sex Ratios, Asia and the Near East (cont.)

Country	(1)	(2)	(3)		(4)		(5)	
	Date & Source	Agricultural LF as percent of total LF	<u>Agricultural LF</u> total (000)	percent female	<u>Nonagricultural LF</u> total (000)	percent female	<u>♂/♀ Sex ratios</u> (age 10+) Rural Urban	
Middle-income industrializing economies								
Thailand	1980/ILO	71	16,717	49	6,864	42	98	94
	1984/YLS	70	18,195	48	7,799	43		
Morocco	1980/ILO	46	2,595	14	3,093	22	98	100
	1982/YLS	43	2,380	16	3,167	23		
Tunisia	1980/ILO	35	668	20	1,240	22	103	102
	1984/YLS	28	475	20	1,216	23		
Jordan	1979/YLS	10	46	1	360	8		
	1980/ILO	10	66	2	579	9	107	108
	1985/FAO	--	133	34	--	--		
Oman	1980/ILO	50	140	3	141	11	98	94

LF = Labor Force

Sources:

1. Date and source: ILO 1980 estimates from International Labor Office (1986), Table 3. YLS figures from censuses or labor force surveys as reported in International Labour Office, *Yearbook of Labour Statistics*, various years, Table 2. FAO figures are enumerations of household and hired workers employed on agricultural holdings in national censuses of agriculture, as reported in U.N. Food and Agricultural Organization (1971, 1981), various census bulletins.
2. Sex ratios (males per 100 females age 10 and over) calculated from United Nations (1988), Table 7.

the ILO estimates for Bangladesh, India, and Pakistan, while they are somewhat higher for Sri Lanka, Indonesia, and most notably Egypt. Disparities are more marked where agricultural censuses conducted under the auspices of FAO have enumerated the number of persons--both household members and hired workers--employed on farm holdings. The 1980 agricultural census of Pakistan, for example, counted far more agricultural workers (permanent workers only) than did the population censuses. Almost all of them were holders and unpaid members of the holder's family, of whom 43% were female. In the Arab Republic of Yemen, the agricultural census of 1977-1983 found that 48% of all family workers on agricultural holdings were female (hired workers were not classified by sex). In Jordan too, the 1985 agricultural census enumerated twice as many farm workers (permanent workers only, household and hired) than did the census and ILO estimates, 34% of whom were female. The ANE strategy statement suggests that as agricultural productivity increases and industries develop, there is a trend toward male outmigration resulting in a greater proportion of women within the agricultural labor force. While this may occur within some countries over time, it does not hold true for the ANE countries considered at a single point in time. Indeed, there is a strong negative correlation between ILO estimates of the female share of the farm labor force and the value of agricultural production per worker shown in Table 1 ($r = -0.81$). In this analysis, countries with the lowest productivity tend to have the highest proportions of female agricultural workers.

It is helpful to place women's agricultural employment in the context of their access to jobs in industrial and service sectors (whether rural or urban, formal or informal). According to Table 2, women's share of nonagricultural jobs in the region varies from about 10% in Bangladesh, Pakistan, Egypt, Jordan and Oman to 40% or more in the Philippines and Thailand. In some countries, women are more visible in the industrial and service sectors than in agriculture (e.g. the Philippines, Morocco) whereas in others the reverse is true (Nepal, India).

The last columns of Table 2 show the ratio of males per 100 females age 10 and over in rural and urban areas. Men outnumber women in both urban and rural areas (i.e. ratios exceed 100) in 8 countries, whereas women outnumber men in both areas in 5 countries. Urban sex ratios substantially exceed rural ratios in Pakistan, India, Bangladesh, Sri Lanka and Nepal, due largely to male-dominant rural-to-urban migration throughout South Asia. The remainder of the countries show only slight differences between rural and urban areas, however, or else evidence of female-dominant migration (Philippines, Thailand). As one would expect, there is a negative correlation between the ratio of rural men to women and the female share of agricultural labor ($r = -0.42$, based on ILO labor force estimates). That is, women are generally less visible in the farm labor force where there

is a surplus of men in rural areas. There is virtually no relationship between the rural sex ratios and the productivity of agriculture as measured ($r = 0.16$).

The aggregate statistics reveal nothing about how agricultural work is organized, however, and whether men and women perform very different tasks or share a common labor burden. The Southeast Asian countries and much of South Asia are dominated by wet rice cultivation (with or without irrigation), in which the traditional gender division of labor is fairly rigid. Women's tasks in crop production generally include seed selection, weeding, transplanting, preparation of organic fertilizer and post-harvest processing, while men are involved mostly with land preparation and activities involving modern techniques or inputs. Tasks such as harvesting, planting and seedbed preparation are shared or done solely by women in less restrictive societies. Women also tend to be responsible for cultivation of fruits, vegetables and pulses, as well as livestock and poultry maintenance. A notable exception to the pattern of highly gender-differentiated tasks is Thailand, where women and men both participate in almost every stage of production. Thailand is also unique among these regions in that it does not suffer from the same degree of land scarcity as does most of Indonesia, India, the Philippines, and Bangladesh.

The Indian case provides an example of how a variation in the rice farming system, irrigated vs. rainfed, interacts with cultural differences to create divergent patterns of women's labor participation. In the highly productive irrigated areas of the South (excluding Kerala) which use labor-intensive HYVs, agricultural participation rates for women are over double those found in the Eastern states, where rice cultivation is predominantly rainfed. Harvesting is also done jointly between women and men in the South, but it falls entirely within men's domain in the East, while other tasks which are often performed exclusively by women in the South (e.g. planting, carrying mud for bunds), are never carried out by them in the East. Correspondingly, orthodox Hindu values which foster female confinement within the household are much weaker in the South than in the East. In neighboring Bangladesh, the institution of purdah is even stronger because of dominant Islamic mores, and women's work has traditionally been confined entirely to the household. Women's participation in agriculture is only slightly lower in Bangladesh than in the East Indian state of West Bengal; the two are very similar with respect to agro-ecological and economic conditions, but are divergent in their religious traditions.

Similarly, in the irrigated Terai region of southern Nepal, where Muslims as well as Hindus have settled, women participate far less in every facet of crop production and related decisions than

women in the predominantly rainfed systems of the mid-hills. This finding applies to wheat, maize and vegetable production as well as rice, and is due to the economic and cultural differences between the two regions. Within Indonesia, Javanese women do not engage in land preparation or terrace construction, but in Central Kalimantan they have been found to participate in all stages of rice cultivation. Throughout the Philippines, women's traditional tasks are transplanting, weeding, post-harvest processing and storage, while harvesting and seedling removal are done jointly with men. In Thailand, however, land preparation is the only task to which women do not contribute, transplanting, harvesting and processing are shared equally by men and women, and only in planting and weeding do women provide somewhat more labor than men.

Women appear to play a less visible role in highly productive irrigated systems where wheat or maize is the primary crop. For example, in 1983 female agricultural participation rates (age 10+) in the North Indian states of Punjab and Haryana, which have experienced the greatest productivity gains since 1960, stood at 4% and 16%, respectively, compared to a national average of 24%. Not surprisingly, participation in the Pakistani Punjab is close to the same level. Women's tasks in these systems include seed preparation, collecting manure for fertilizer, and post-harvest processing operations. They sometimes contribute to weeding, harvesting, threshing, binding wheat and husking maize, but field preparation, (chemical) fertilizer application and grain transport are solely male responsibilities. Similarly, women in Upper Egypt, which has a long history of flood-based irrigation and a conservative social structure, participate significantly less in all crop production activities than women in the more cosmopolitan Nile delta. Women in Tunisia and Morocco are all but invisible in field operations for wheat production. In areas which grow coarse grains (millet, sorghum) that cannot be irrigated, women's participation is far greater than in neighboring areas that share similar cultural traditions but are of higher productivity: participation is high in Yemen compared to Egypt or Jordan; it is higher in those parts of India and Pakistan that are not irrigated than in areas that are; women in the hill areas of Nepal are more involved in field production than Terai women.

Given these general patterns, some rough classification of agricultural systems can be made on the basis of primary crop(s), use of irrigation, and the degree of cultural restrictions on female mobility. Obviously, these characteristics did not emerge completely independent of one another. Over centuries, cultural value systems gradually adapted to economic requirements as production systems evolved, and in most cases a delicate equilibrium was achieved that balanced the need for women's work with constraints on their visibility such that subsistence production could more or less be maintained. External events and conditions such as wars, natural disasters, colonization, and

improved health conditions (which accelerate population growth) have continually impinged upon these precariously self-sufficient systems. They consequently re-adapted and modified to their new circumstances. In recent times, however, changes have been especially rapid and complex. These have included the introduction of modern technologies, the commercialization of agriculture and the integration into the global economy of some of the remotest areas.

LB. Dynamics of Agricultural Transformation and its Gender-Differentiated Effects

I.B.1. Middle-Income Industrializing Economies

The four countries designated as middle income industrializing countries are Thailand, Tunisia, Jordan and Oman. As noted in the introduction, Morocco has been included in this group because of the economic changes it has undergone since 1985.

According to the A.I.D. strategy paper,

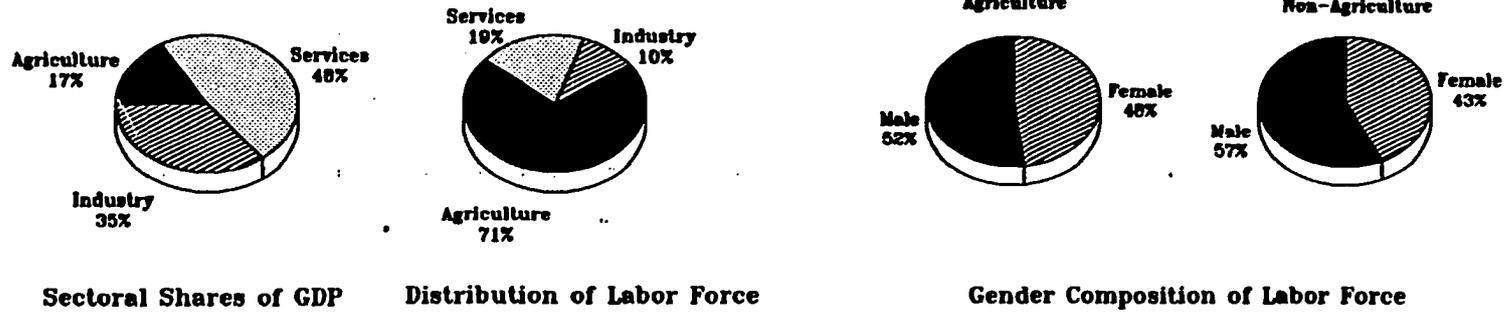
As countries advance from low income and transitional agricultural economies, there is a clear trend toward out-migration of male labor from agricultural production. This changes the composition of the rural labor force towards higher female participation, as managers as well as laborers.

The report adds that women's participation in activities outside the household also increases as countries move into the third stage of development. Are these generalizations valid for the five industrializing countries considered in the strategy? The evidence presented in Tables 1 and 2, as well as associated evidence on employment trends, suggests that actual conditions are far more diverse than the linear development model would imply. The following descriptions reveal this divergence more clearly.

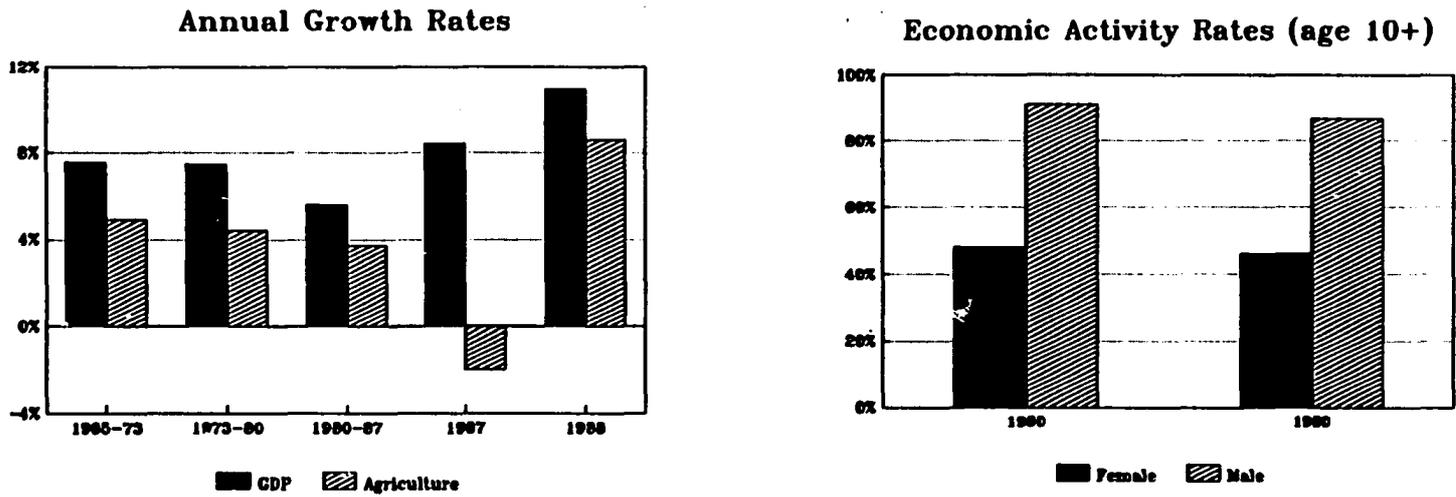
THAILAND

Despite the fact that over one-third of Thailand's GDP was derived from industry in 1988, it remains an agricultural economy insofar as over two-thirds of the labor force is employed in agriculture (Fig. 1). Although both male and female agricultural activity rates are declining, the farm labor force continues to grow in absolute terms, and the female share has remained about 50% since 1960. The female share of industrial and service employment has risen from about 37% to 43% in 1980, which reflects the predominance of women in urban-bound migration. Seasonal migration between rural areas is not dominated by men or women, except migration for employment in large-scale agricultural processing enterprises, in which women comprise the majority of migrants. Thailand is also unusual in that there is no large differential between male and female labor shifts out of agriculture. If anything, women are leaving somewhat more rapidly than men. This phenomenon is partly explained by the absence of strong cultural taboos which restrict women's mobility, and their

THAILAND



13



Sources: World Bank, 1989, 1990; ILO Yearbook of Labor Statistics, various years (see table 2); Sivard, 1985.

Figure 1

willingness to enter low-paying jobs in the urban informal sector.

Agricultural production in Thailand has not undergone the kind of transformation expected in middle-income industrializing countries. Farming is still done using traditional techniques. Only 20% of cultivable land that is irrigated can support HYVs; only 4% allows for a dry season crop. Fertilizer use per unit of cultivated area is among the lowest in Asia, and with only one-quarter of farmers applying chemical pesticides or herbicides to crops, and high annual losses (17%) are estimated due to rats and disease. Thailand is able to maintain high production and export levels (especially of rice) because of the relative abundance of arable land, not because of modern technologies. In fact, yields are among the lowest of major rice producers, and as indicated in Table 1, labor productivity is only slightly higher than that in India or Bangladesh.

Seasonal migration between rural areas is widespread. Most migrants originate from the Northeast, the poorest and most densely populated region. The irrigated parts of the North and the Central flood plain absorb the most migrant labor, and labor demand in these regions is high throughout the year, since a variety of crops with different cultivation patterns are grown. Peak migration occurs during the slack seasons for rice, after transplanting and after harvesting. Women sometimes migrate to work in agricultural processing. A survey in the Northern region of Chiang Mai found that women often spent three to four months away from their homes to work in tobacco factories, where returns from wages were over a third higher than other non-farm activities and more than one and a half times those of agricultural activities in the area (RRNA, 1989). Women participate equally in migration between rural areas. Since 1983, women have been the majority of rural-to-urban migrants (Tonguthai, 1988).

The rate of rural-urban migration for women is undoubtedly much higher than that for men; one study of migration to Bangkok found that among those ages 10-19, twice as many women than men were leaving rural areas. Among these women, about three-quarters migrated independently, and nearly all are unmarried. Unemployment is lower among migrant women than non-migrants, probably due to greater economic necessity; 70% of migrants in Bangkok work in low-paying, low-status jobs in the informal sector, including domestic work, waitressing, factory assembly and prostitution. The average length of stay is two years, and rarely do migrants move into the formal sector in that time. It is usually unfeasible for them to seek any training which would allow them to assume higher-paying jobs, while employers are unwilling to invest in upgrading migrants' skills because of the short duration of employment, nor to increase wages since migrants are expected to

leave their jobs as soon as they have saved a certain amount of money. Since other cash sources are limited, remittances go toward meeting the family's basic consumption requirements and they may represent up to half of household income (RRNA, 1989). Because family landholdings are usually small, unirrigated and of poor soil quality, remittances are usually not used for agricultural investment even if income is sufficient (Tonguthai, 1988).

Apart from the informal service sector, women are the majority of workers in several major industries, including textiles, clothing and electronics. Since 1960, employment growth in the manufacturing sector has been significantly higher for women than for men, and in commerce, female employment has grown at almost twice the rate for men. The share of the female labor force working in industry more than tripled during 1971-1986. In clothing and footwear, women comprise 80% of the labor force; in manufacturing, 40%; in wholesale and retail trade, 37%.

Much of the recent expansion of rice production as well as women's employment opportunities in manufacturing has been the result of liberal trade and monetary policies initiated in the early 1980s. Import tariffs were reduced and rationalized in 1982, thus "reducing the overall variability of [protection] rates and reducing the average nominal rates on finished consumer goods slightly while increasing them on most other goods." (A.I.D., 1989) By 1984, the Baht had been devalued and additional steps were taken which further reduced protection levels and their variability. In 1985, however, several of these actions were reversed and the effective rate of protection was increased by 5%, because of the decline in government revenues brought about by earlier reforms. The export sector, however, continued to enjoy such benefits as reduced duties on inputs, or even complete exemptions, preferential credit, and decreased export duties on several agricultural commodities, including the rice premium which was halved from 5% to 2.5% in 1984. The replacement of the elaborate rice price control system with a simpler paddy mortgage scheme was also critical for expanding production of that crop, while sugar exports have actually received subsidies in recent years (RRNA, 1989).

One of the most apparent effects these policies have had on women, apart from the general increases in household income through agricultural exports, is the growth of the textile and agro-processing industries. Textiles and clothing are the single largest source of foreign exchange and are dominated by female entrepreneurs and labor. As the government continues to encourage export expansion, it can be expected that more women will benefit from the growing opportunities in this industry, but this should not overshadow the poor working conditions, extremely long hours and low

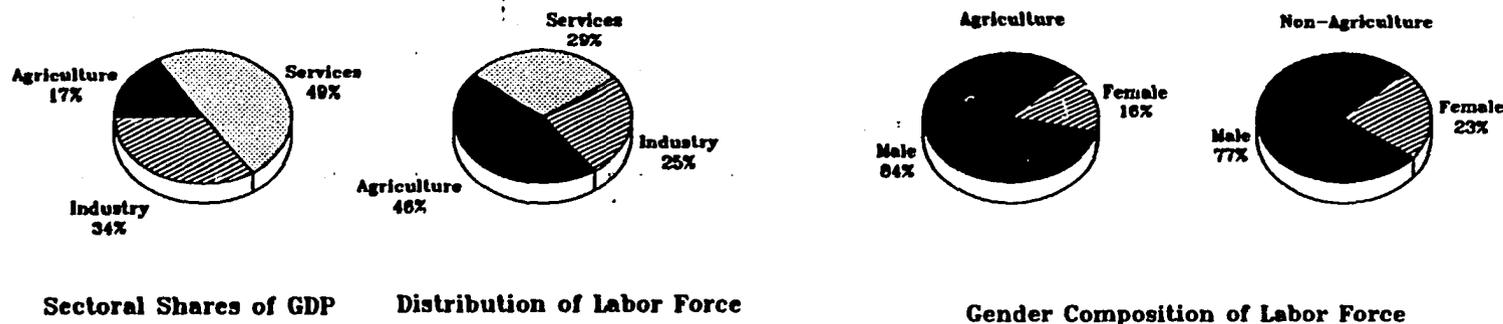
wages which characterize these jobs. Those women who own or manage export enterprises can be expected to benefit greatly from liberal economic policies. Women have also benefitted from policies aimed at expanding local dairy production, such as duty-free import of cows and equipment and a floor price for milk. Anecdotal evidence suggests that women entrepreneurs are rapidly moving into dairy operations (but this may be partly offset by the high cost of soybean feed, which is protected). In addition, steps such as eligibility of small- and medium-scale agricultural enterprises for special privileges from the Board of Industry, and tax exemptions for firms that locate in rural areas, have also contributed to improving employment and income-earning opportunities for rural women. Production of broiler chickens, artificial flowers and other cottage industries are being taken up by women in several areas (A.I.D., 1989).

MOROCCO AND TUNISIA; JORDAN AND OMAN

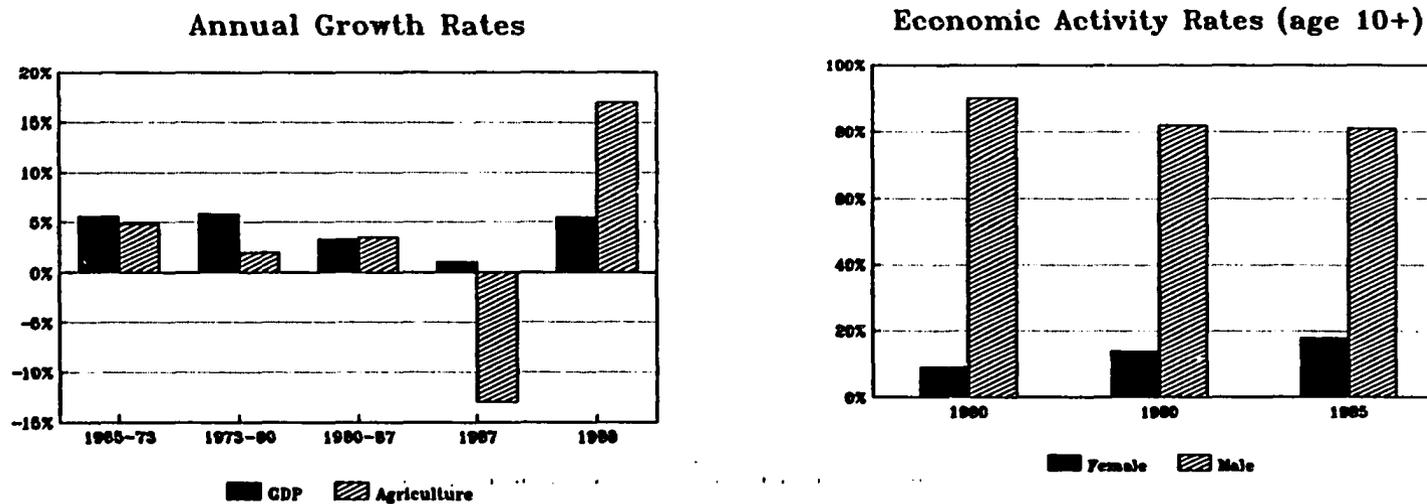
Morocco and Tunisia share several economic characteristics despite Tunisia's significantly higher GNP per capita (Table 1; Figs. 2,3). Employment patterns are also quite similar. In both countries, the share of the workforce in agriculture is shrinking, but the absolute number of agricultural workers continues to grow. Declining rates of male agricultural activity, often due to out-migration of working-age males, combined with low but rising rates of female activity, result in a growing share of farm work in both countries being done by women (from about 10% in 1960 to 16% in Morocco and 20% in Tunisia by 1980)*. Because coastal areas tend to support more productive (irrigated) agriculture and attract foreign investment in industry and services, men from smaller and less productive inland farms have been the ones to migrate to the coast, and among Moroccan men, also to Saudi Arabia, the Gulf states and Europe. Although women's share of the farm labor force has been increasing somewhat, their participation in agriculture is constrained by time availability and cultural norms. These factors, together with the high costs of remaining male labor, forced the withdrawal of some lands from cultivation. In more recent years, however, there seems to have been a large-scale (permanent) return of male migrants, with a corresponding decrease in women's labor force participation and increase in unemployment among women and men. Many rural women have also returned to "economically inactive" status. The female shares of non-farm jobs have been rising

* At least one early census of Morocco (1952) counted women as 37% of all farm workers and in Tunisia (1956) as 38%. These disparities result from the adoption of a restrictive definition of economic activity in recent censuses that has specifically excluded most "female family helpers" in agriculture. Thus it may be that approximately one-third of the farm labor force in Morocco and Tunisia is female rather than 15-20% reported here, especially if post-harvest processing of wheat and barley is included along with women's work in more intensive horticultural activities.

MOROCCO



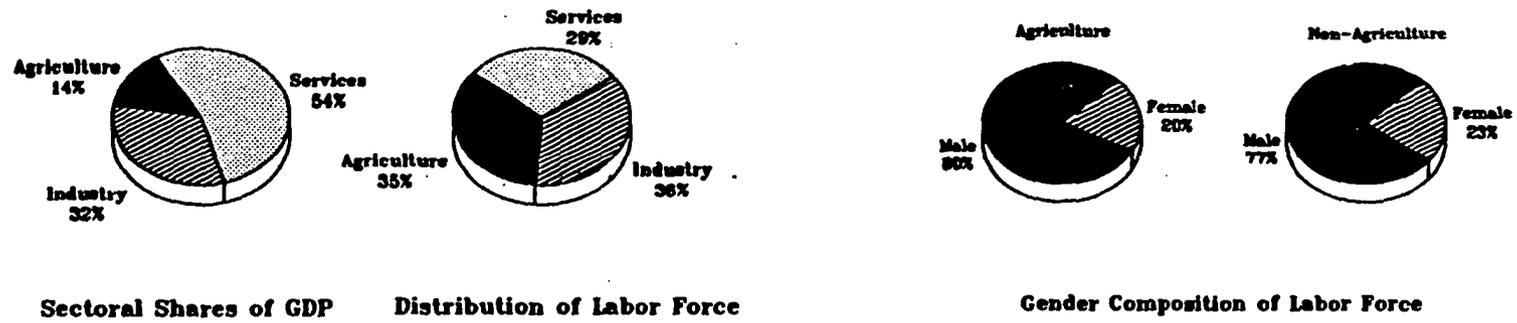
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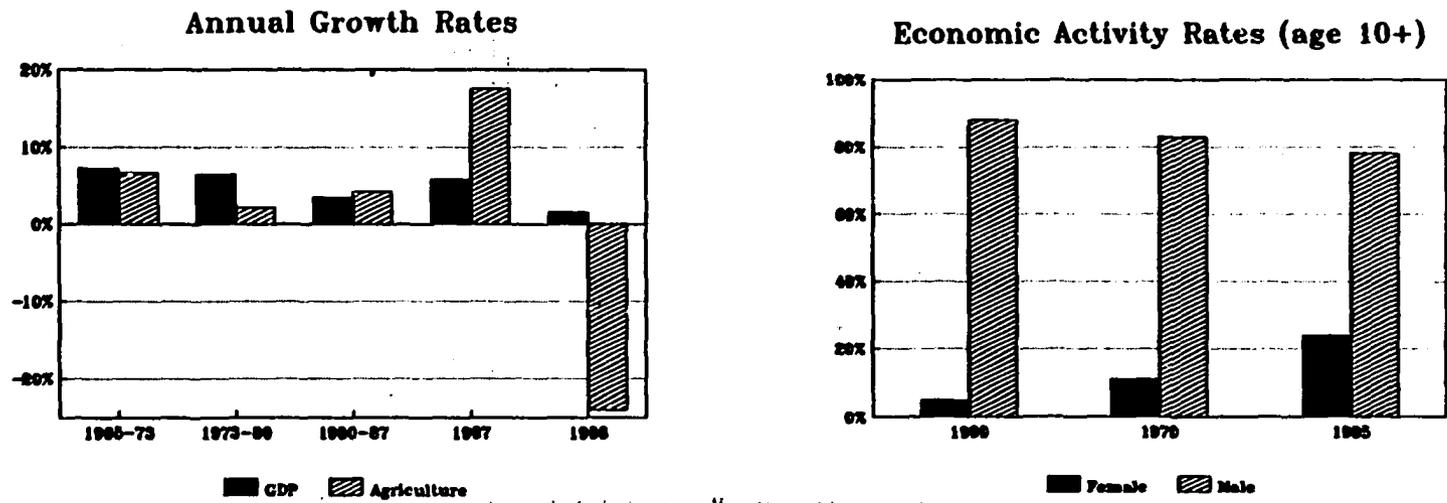
Sources: World Bank, 1989, 1990; ILO Yearbook of Labour Statistics, various years (see table 2); United Nations, 1989.

Figure 2

TUNISIA



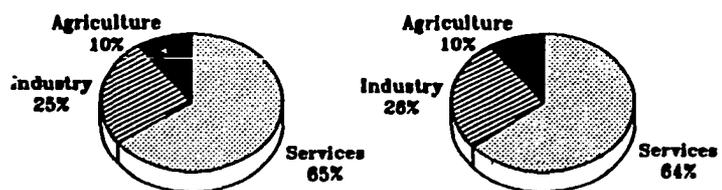
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Sources: World Bank, 1989, 1990; ILO Yearbook of Labour Statistics, various years (see table 2); United Nations, 1989.

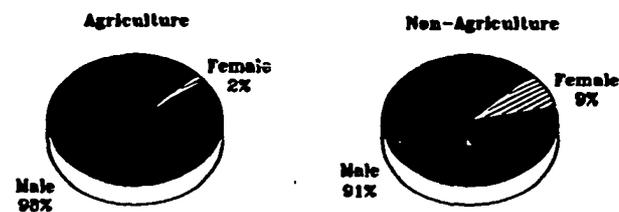
Figure 3

JORDAN



Sectoral Shares of GDP

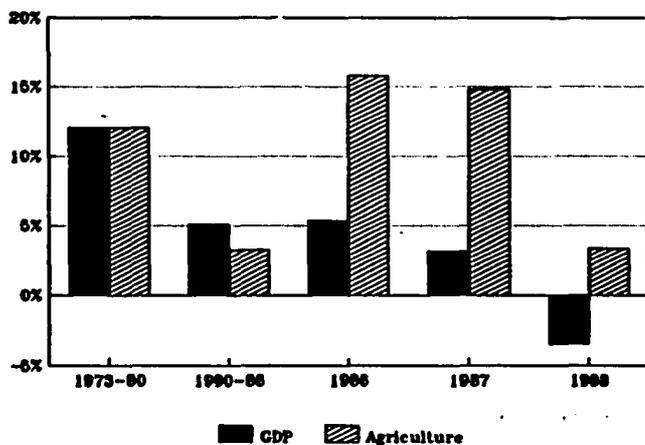
Distribution of Labor Force



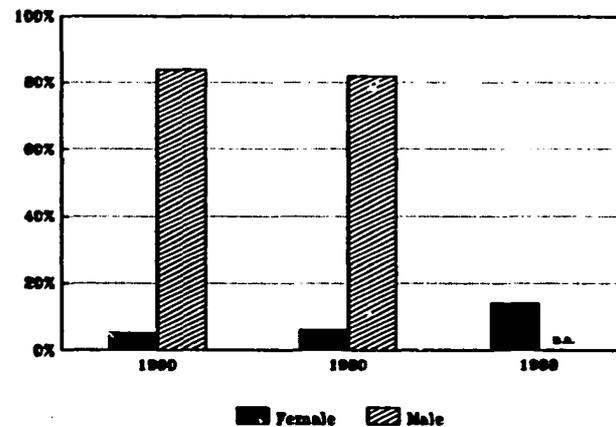
Gender Composition of Labor Force

19

Annual Growth Rates



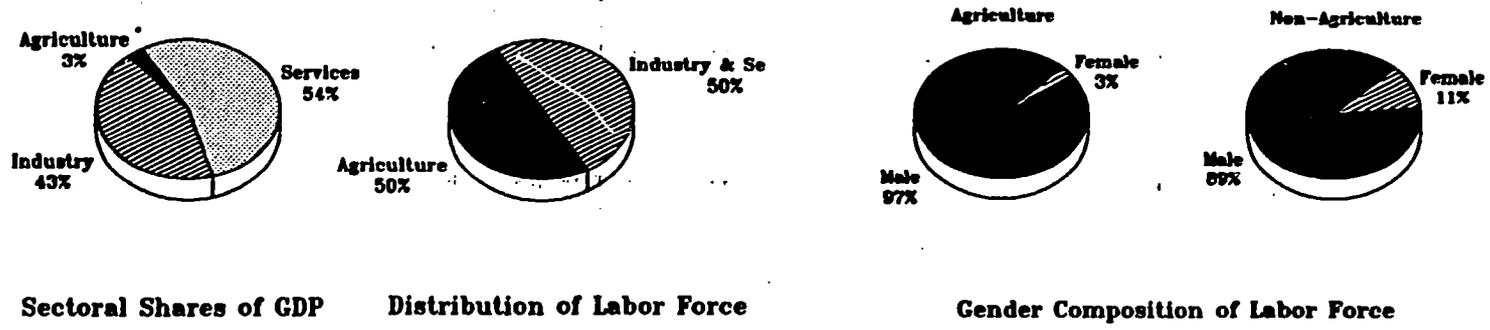
Economic Activity Rates (age 10+)



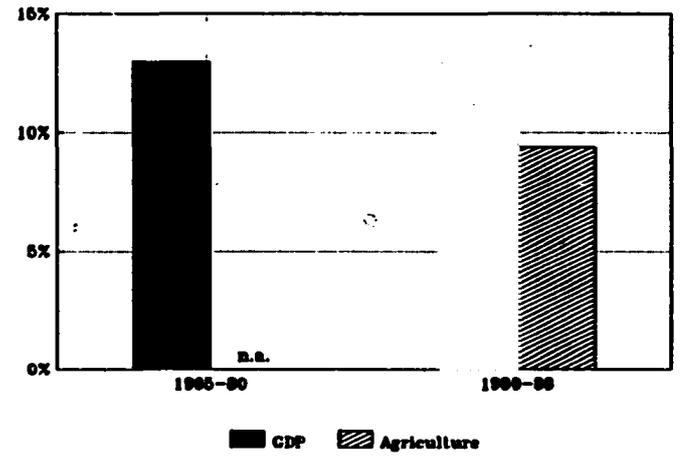
Sources: World Bank 1989, 1990; International Labour Office, 1986; Sivard, 1985; El Said, 1989.

Figure 4

OMAN



Annual Growth Rates



Sources: World Bank, 1990; ILO, 1986

Figure 5

since 1960, as women's participation rates in industry and services climb slowly.

Jordan is unique with a rapidly shrinking agricultural labor force in both absolute and relative terms combined with very high value of agricultural production per worker (Table 1). With a declining male activity rate and a very low female rate reported in official statistics, the female share of farming remains constant at less than 5%. According to the 1985 Agricultural Census, however, women make up 34% of the permanent agricultural labor force, 57% of self-employed and unpaid family farm workers, but only 9% of hired farm laborers. Oman is also unusual: with half its total labor force in agriculture (including fisheries) in 1980, the sector accounted for only 3% of total GDP in 1988. Women make up a minute portion of agricultural workers but their share of the non-farm labor force has risen (from 6% to 11%), and growth in Jordan has been similar. Male migration from Jordan and within Oman has been much greater than in Morocco and Tunisia. The 1985 Jordanian agricultural census found that among land-holding households, the ratio of men to women (ages 15 and over) was only 0.92, with the fewest men found on the smallest holdings from which male migration was most intense. Especially in Oman, the effect of male migration on agriculture has been dramatic. During 1965-85, cultivated area decreased by three-quarters, mostly for labor-intensive wheat production, because large numbers of rural men migrated to the oil fields. As in Morocco and Tunisia, women have been entering the nonagricultural labor force in larger numbers, but their share of such jobs has grown from only 6% to 9% since 1960. Again, most female industrial workers are in textiles, clothing and leather. They comprise over half the industry's workforce, but two-thirds of them are unskilled informal workers.

In Morocco and Tunisia, cereals production grew by only 2% and 1%, respectively, during the period 1963-79, although they occupy about one-half and one-third of cultivable area. Although yields for wheat (the primary cereal) rose considerably in the 1970s, they were still much lower than those in India, China and Mexico, where HYVs were being exploited more widely. The two governments did, however, make large investments in irrigation, mechanization, and other infrastructure beginning in the 1960s. Tractors were especially important in allowing expansion of cultivated area in the 1970s, but they also displaced labor (contributing to unemployment) and accelerated erosion and desertification. Their labor-displacing effects have been somewhat offset by increased opportunities in urban areas or oil-producing neighbors, and large-scale male migration has taken place from rural areas in all four countries.

With steady increases in women's labor force participation (LFP) and some female migration

to urban areas, a large portion of new entrants are drawn into the manufacturing sector, as indicated by its growing share of the female labor force in all four countries. In Tunisia, the textile and leather industry has traditionally been an important source of female employment; between 1975 and 1984, nearly half of all new jobs for women were in textiles and leather (compared to 21% in agriculture). Although women made up 87% of the workforce, only one-quarter of them were salaried employees. The situation is similar in Jordan, where women are nearly half of the industry's workforce, but two-thirds of them are unskilled, having received no vocational training. Most jobs are in the informal sector, where women work at home on a piecework basis. While in Tunisia the industry grew by an average of 8% per annum during 1975-84, this figure fell to 4% during 1984-89 (although textiles were still 30% of exports), and thousands of women lost their jobs as a result (IFID, 1990). This drastic fluctuation reveals the industry's vulnerability to worsening international market conditions which appeared in the 1980s.

The decline of textiles and leather in Tunisia was at least partially the result of the broader adjustment program undertaken since 1985, which has adversely affected an estimated five hundred (formal sector) enterprises that employ about 20,000 people (Roe et al., 1989). Men and women in informal sector activities also suffer greatly from the effects of structural adjustment, namely the disadvantaged position of the non-tradeable sector combined with the increased cost of living and depression of real wages. Structural adjustment has successfully stimulated expansion of export industries, and those who are able to gain employment in these enterprises are among its beneficiaries. Women do appear to be benefitting, as their share of employment growth in manufacturing (excluding textiles and leather) has almost tripled from 6% (1975-84) to 17% (1984-1989). The proportion of women is increasing rapidly in the agroprocessing, chemical and electrical industries (IFID, 1990). Their numbers are still small in relation to those in rural areas who have become unemployed or withdrawn from the workforce over the last five years, but current trends reveal a gradual improvement in women's economic participation. Although data for Jordan and Morocco are more limited, it is likely that women's activities have followed similar patterns in these countries since their adjustment programs were launched.

I.B.2. Middle-Income Transitional Economies

As the ANE strategy describes,

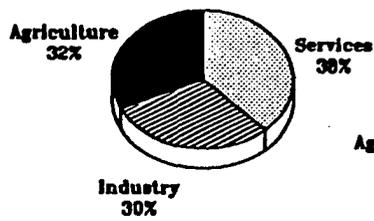
These economies have experienced limited success in their development efforts. applied agricultural research and dissemination of high-yielding rice and wheat varieties has paid off, production has increased, per capita consumption is up, and the shift into the industrial and service sectors of the economy has begun. Within agriculture, diversification away from an emphasis on cereals is underway. Gains in agriculture are reflected in overall increases in per capita income, adjustments in food demand, the growing importance of the service and industrial sectors, and the increasing economic role of women outside the household.

Although these are very general trends, it cannot be expected that they appear identically manifested in all seven of the middle-income transitional economies under consideration. With per capita GNP ranging from \$340 to \$660 and industry providing 23% to 36% of GDP (1988), the countries in this category vary enormously in the structure of their economies, the types of changes within the agricultural sector and in the economy as a whole that have taken place over the past few decades, and the role that women's labor has played in those changes. There are some broad similarities between countries in the same geographic region. The share of GDP in agriculture varies from 21% in Egypt to 32% in India, and when ranked by this measure, the South Asian countries (India, Pakistan, Sri Lanka) are on the high end of the spectrum, the Southeast Asian countries (Indonesia, Philippines) fall in the middle, while the Near Eastern states (Yemen, Egypt) have the lowest share of GDP in agriculture. The following analyses examine these three groups of countries in terms of: (i) women's and men's participation in agriculture and other sectors; (ii) how their agricultural work has changed with modernization and other structural transformations; (iii) the extent and nature of migration that has taken place within or from each country; (iv) and what, if any, changes appear to have taken place involving women in agroprocessing activities.

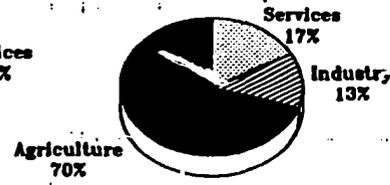
INDIA, PAKISTAN, SRI LANKA

These three countries show rather similar characteristics, as seen in Table 1, with the exception of the export share and orientation of agricultural production: 50% of Sri Lanka's exports are agricultural (primarily tea and rubber) compared with 30% of Pakistan's (rice, cotton) and only 18% of India's, where engineering products and textiles and clothing dominate exports. The portion of agricultural production that is exported is also highest for Sri Lanka (32%), followed by Pakistan (8%), and lowest in India (1%). The agricultural labor force continues to grow in size, but is

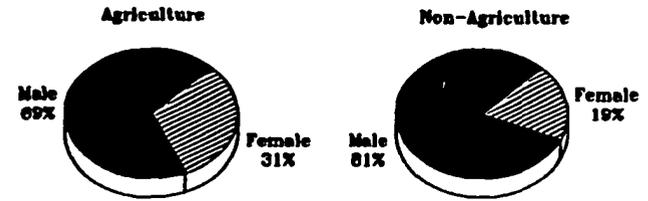
INDIA



Sectoral Shares of GDP



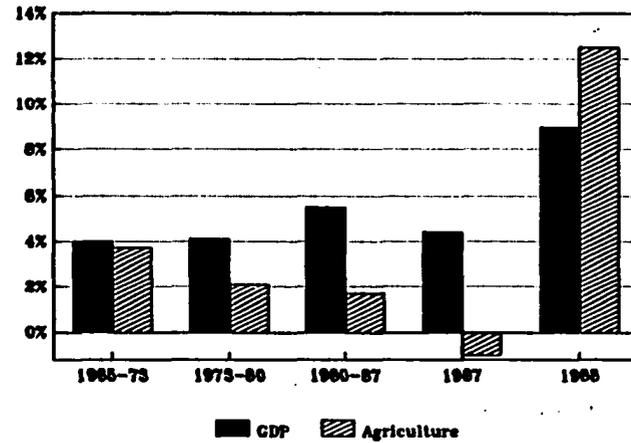
Distribution of Labor Force



Gender Composition of Labor Force

24

Annual Growth Rates

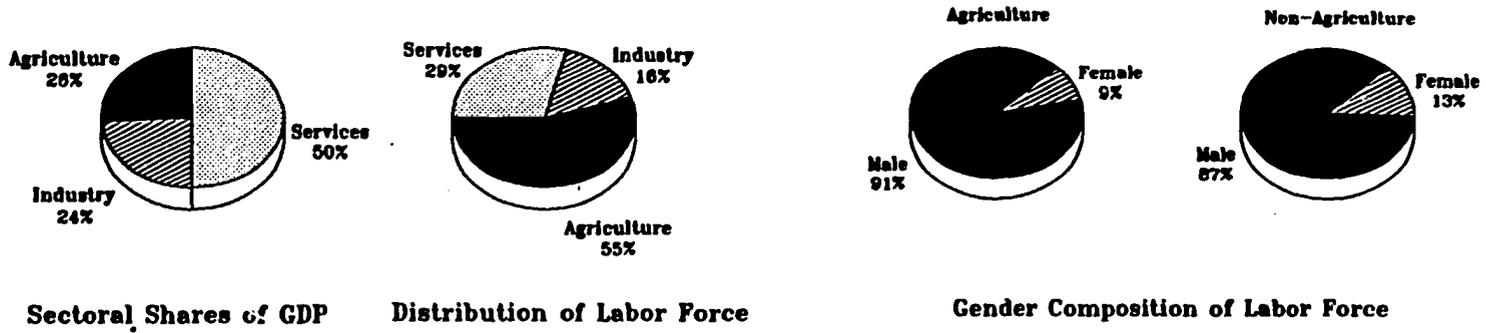


Economic Activity Rates (age 10+)

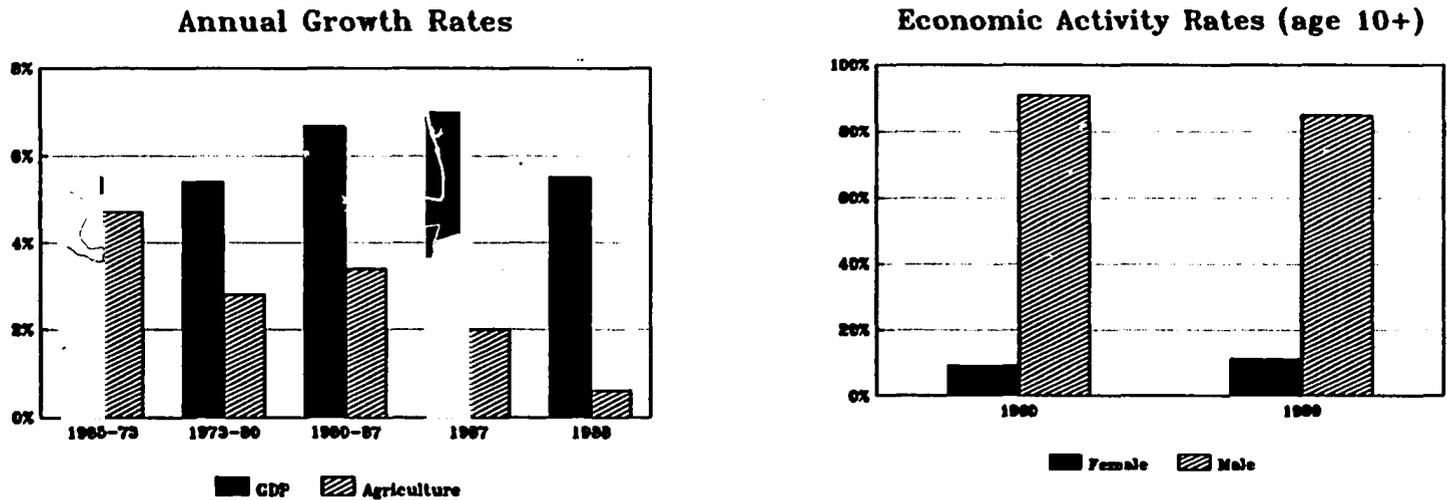


Sources: World Bank, 1989, 1990; ILO, 1986; Sivard (1985)

PAKISTAN



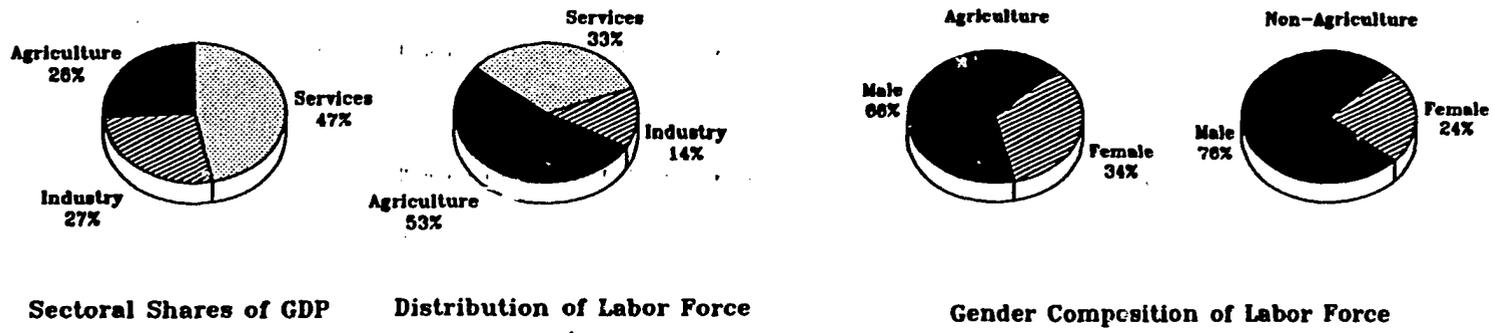
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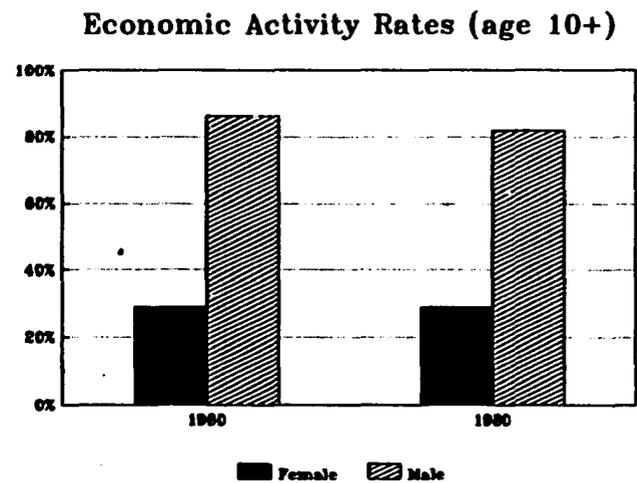
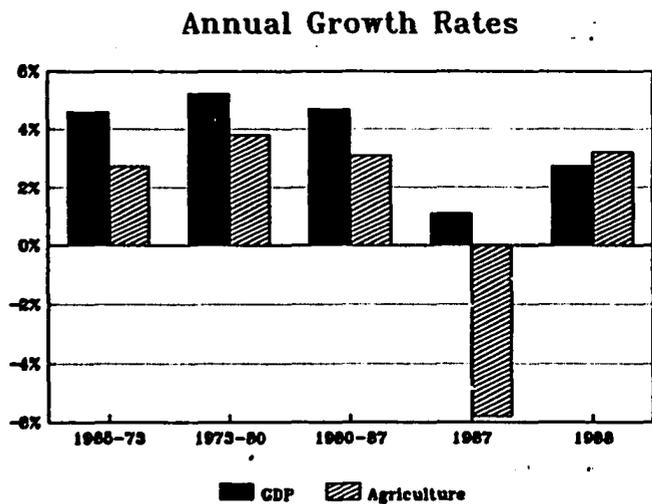
Sources: World Bank, 1989, 1990; ILO, 1988; Sivard, 1988.

Figure 7

SRI LANKA



26



Sources: World Bank, 1989, 1990; ILO Yearbook of Labour Statistics, 1985; Sivard, 1985.

Figure 13

gradually decreasing as a fraction of the total labor force in all three countries as male participation rates remain constant or decline. During 1981-88, the total agricultural labor force grew by 1.5% annually in India, 2% in Pakistan, and 1.3% in Sri Lanka. India and Pakistan have experienced considerable agricultural growth since the 1960s (see Figs. 6-8). India has been self-sufficient in foodgrains since the 1970s, while Pakistan is currently a major rice exporter.

Unlike India and Pakistan, food production in Sri Lanka stagnated during the 1980s, with per capita production in 1986-88 falling by over 20% from 1979-81 levels (World Bank, 1990). This sharp drop in production--the largest of any of the 14 ANE countries--occurred despite persistent efforts on the part of the government to encourage domestic agricultural production through price supports and import restrictions. Although cereal imports declined between 1974 and 1988, food aid in cereals rose. The value of agricultural exports per worker in 1988 was the highest of all middle-income transitional economies in the ANE region, but Table 1 reveals that the total value of agricultural production per worker was lower than in several countries, including Pakistan, Indonesia, and Yemen. Correspondingly, many smallholder families cannot support themselves solely on their farm incomes. Among those owning less than 1 hectare, fewer than half report agriculture as their primary occupation, compared to 80% of holders with 1-4 hectares. Thus, although agriculture is heavily export-oriented in Sri Lanka, it is characterized by low productivity and is an inadequate base for supplying domestic markets, absorbing excess rural labor or generating sufficient foreign exchange to meet food needs.

The percentage increase in the numbers of agricultural laborers has been consistently higher among women than men in India and Pakistan. This variance is largely explained by male migration and increased landlessness, which forces greater numbers of women to abandon status considerations and enter the labor force to meet subsistence needs. In India, rural women are twice as likely as men to depend on agricultural wage labor as their main source of income (Chen, 1989). Greater use of male and female labor with modern cultivation techniques has also been a factor in some areas, and several studies conclude that the increase in women's labor use with technological change has actually been greater than that for men's labor. Women constitute about 30% of all farm workers in India and Sri Lanka and about 10% in Pakistan, although precise levels and trends are uncertain because of data disparities.* Trends in female participation in industry and services are also uncertain in

* Pakistan represents a vivid example of underestimated female farm contributions derived from population censuses and ILO estimates as compared with censuses of agriculture (Table 2). The population census of 1981 enumerated 11.3 million people in the agricultural labor force, of whom only 3% were female (and 2% among hired hands). However, the 1980

India and Pakistan, ranging between 12% and 20% of the nonagricultural labor force in India and between 6% and 13% in Pakistan, depending on the source of data. Trends are clearer in Sri Lanka, where rising rates of female economic activity outside agriculture have resulted in a growing female share of nonfarm jobs (from about 15% in 1960 to about 25% or more in the 1980s). As noted earlier, there is marked evidence of male-dominated seasonal migration to the cities in all three countries, although adult males still appear to outnumber females in the countryside as well in urban areas.

In considering the changes pertaining to male or female labor force participation and agricultural roles in the South Asian countries, as well as broader economic transformations, the vast regional variations that exist cannot be ignored. India contains at least three distinct agro-ecological zones in which modernization has taken place to differing degrees and socio-cultural barriers to female mobility and employment vary in their intensity. Much of Pakistan resembles the northwestern portion of India, in which modern technologies predominate, agriculture is highly productive, and high social value is attached to female seclusion. By the same token, much of Sri Lanka resembles parts of Southern India, where estate or plantation production plays an important role in the economy, irrigation is widespread but usually not accompanied by the use of HYVs, and women move about more freely and enjoy higher status and autonomy than in the northern regions. Within a single region, the level of female participation in most agricultural activities also varies considerably with farm size, tenurial status and caste. The Arian and Jat ethnic groups of Pakistan, who represent the traditional farming communities, show the highest female participation in all provinces. Syeds, Rajputs and Pakhtuns in the Northwest Frontier Province (NWFP) show the lowest levels, although one survey in five NWFP districts found that 82% of women participated in agricultural work and devoted 45% of their collective time to it (World Bank, 1989). Women were

Census of Agriculture enumerated 16.9 million permanent workers in agriculture (that is, excluding casual workers), almost all of them holders and members of the holder's household, of whom 43% were female. Over half of adult females (54%) worked primarily on the family holding and an additional 3% were employed off the holding. Even these figures may be underestimated, however, because the agricultural census excluded women for whom farming is an important secondary activity but whose main activity involved handicrafts and other cottage industries. In addition, the one-third of rural households that are landless are not included in the agricultural census unless they raise cattle. Women and men from this group form the bulk of the permanent or casual agricultural laborers in the fields of wheat, rice, sugar, and cotton, but their gender is not identified in the farm census. Women from landless households generally show a higher level of participation, and contribute a greater share of family income, than women from the higher-income "agricultural" households.

Other studies estimate that women in Pakistan contribute 25-40% of household income, including the value of tasks performed as unpaid labor. Their contribution to total labor is probably closer to 50% (World Bank, 1989). Women generally work fifteen to sixteen hours per day, a much longer period than the average man's work day (Hashmi, 1988). Although conventional labor force participation statistics in both Pakistan and India place women's economic activity at absurdly low rates, it is clear that the majority of women work in agriculture as either wage laborers or unpaid family workers.

responsible for 25% of major crop production, including 30% of food production (Shah and Jabeen, 1988). Similarly in Sri Lanka, women comprise over half the workers on tea, rubber and coconut plantations, but they are predominantly Tamils who reside on the estates, while only a small number come from the Sinhalese households in neighboring communities. The latter group are usually driven to wage employment as a consequence of male outmigration (Kurian, 1982).

The adoption of HYVs has had somewhat varying effects on female labor, but some general patterns do emerge. In a study of three Indian states conducted by Agarwal (1984), it was found that HYV rice required greater labor inputs (per cultivated area) than traditional varieties. New labor was provided mostly by male and female casual hired labor rather than family labor or permanently hired labor). Female family labor increased or decreased depending on the rise in family income with greater farm output. If a family could afford to hire labor to carry out women's tasks, family labor was withdrawn to improve status. Although the demand for both male and female hired labor increased, real wages actually declined between 1965 and 1975, the period when area under HYV rice expanded immensely. This drop was at least partly due to increased landlessness, and hence a larger supply of wage labor. In both India and Pakistan, but particularly in irrigated wheat-growing regions, higher land productivity associated with HYVs and mechanization led many landowners to evict tenants and shift to a more profitable arrangement by hiring wage labor to cultivate (Agarwal, 1984; Hashmi, 1988). A two-village study in Pakistan concluded that landlessness also increase in areas with high levels of male migration (Palmer, 1985). The net result is a larger surplus of labor, especially female labor, and in many landless households real earnings from agricultural labor probably decreased.

As elsewhere, mechanization of agricultural processing operations has had highly adverse consequences for landless women throughout much of Pakistan and in parts of India. A study of Madhya Pradesh state found that displacement of women workers in threshing, rice hulling, flour milling and oil extraction had taken place regardless of major crop(s) grown (wheat, rice and/or cotton), and that virtually no off-farm employment opportunities existed to replace lost income (Bagchi, 1982). In Pakistan too, mechanization of threshing and harvesting operations has been the main cause of female labor displacement.

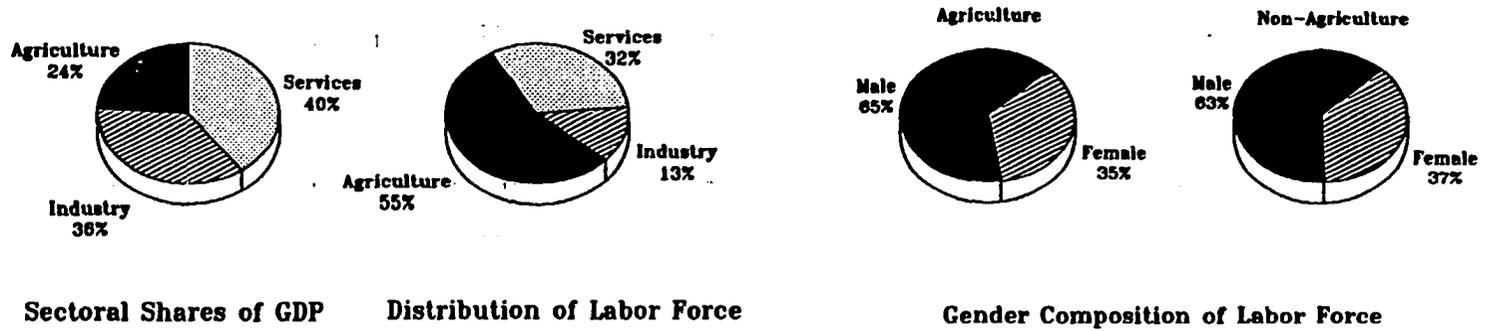
Close to 10% of Indian women work in non-agricultural occupations, and of this group, over two-thirds are in the informal sector. A smaller percentage of Pakistani women are engaged in non-agricultural work, and they are even more heavily concentrated in the informal sector. Although

industry has grown rapidly, especially in the 1980s, it has generally failed to create significant employment for growing labor forces, and women appear to be bypassed by the few opportunities that do appear. Industrialization has indeed reduced some income-earning opportunities that were once available to women. Mechanization of spinning and weaving and the growth of textile factories in Pakistan have eliminated income from home-spun thread and handloom production; large-scale poultry production has replaced village-level trade traditionally carried out by women. More capital-intensive methods for processing nuts, oils and coffee have displaced large numbers of Indian women; increased urban demand for snacks, beverages, etc. has only partially compensated for lost female employment. In the Indian manufacturing sector, and particularly textiles, women are being absorbed into non-traditional sub-sectors in greater numbers than men, but they usually remain within the informal sector: whereas half the men in the urban manufacturing sector are regular wage workers, only a fifth of the women are. Women tend to be hired under a "putting out" system, where they are contracted on a piece-rate basis and work at home. One-quarter of women employed in the urban sector of Pakistan are home-based pieceworkers, another quarter belong to the formal sector, while the majority work in informal services and microenterprise (World Bank, 1990b).

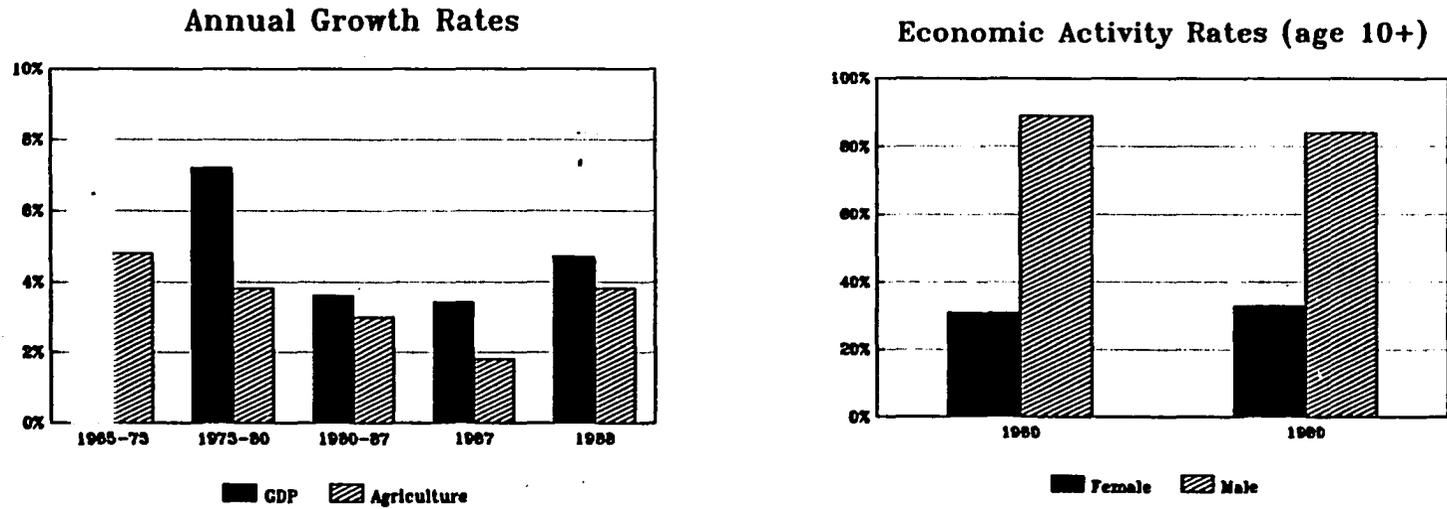
INDONESIA AND THE PHILIPPINES

Indonesia and the Philippines have slightly higher per capita incomes and industrial shares of GDP. Although economic growth has been considerably slower in the Philippines than in Indonesia, the two have experienced similar transformations in their agricultural sectors over the last three decades. The major factor behind Indonesia's outstanding growth in the 1970s was large petroleum exports, while in the Philippines, industry and services, supported by massive foreign investment, were the main driving forces. With high oil prices and interest rates, the Philippines experienced declining growth rates in the early 1980s. Indonesia's economy suffered mainly because of the collapse of oil prices soon thereafter. Agriculture's share of GDP remained fairly constant in the Philippines (at approximately one-fourth), but its share of Indonesian GDP has dropped from over one-half in 1965 to slightly less than one-fourth in 1988. Agriculture accounts for about a quarter of all exports in both countries, primarily rubber, coffee, and tea in Indonesia and coconut and sugar in the Philippines, but their share of total agricultural production is negligible in Indonesia and only 10% in the Philippines. Rice is the primary crop in both countries, and remarkable gains have been made towards self-sufficiency: Indonesia became a rice exporter in 1985, and the Philippines reached near self-sufficiency close to the same time. These achievements followed

INDONESIA



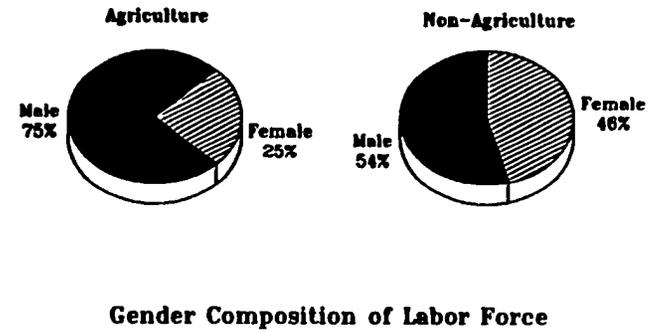
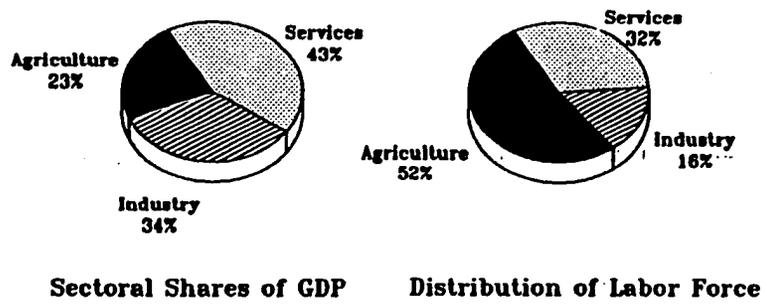
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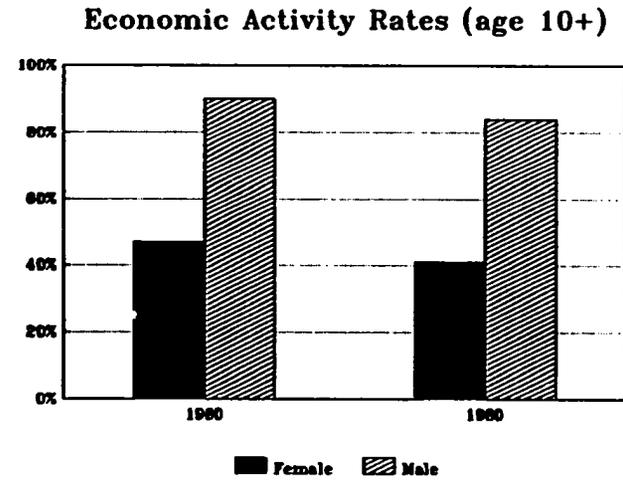
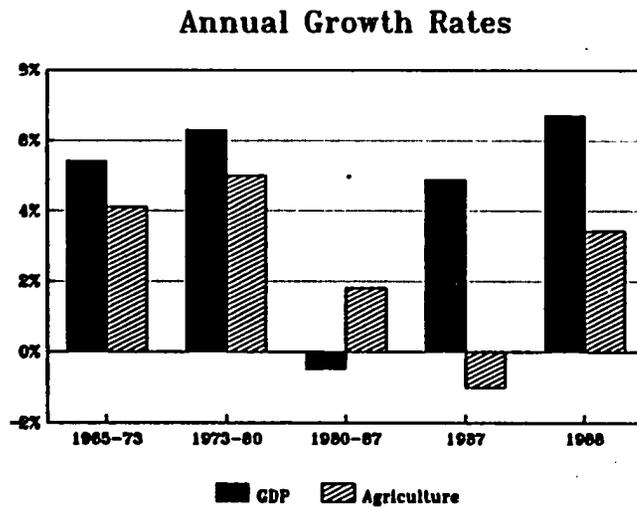
Sources: World Bank, 1989, 1990; ILO Yearbook of Labour Statistics, 1985; Sivard, 1985.

Figure 9

PHILIPPINES



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Sources: World Bank, 1989, 1990; ILO Yearbook of Labour Statistics, 1987; Sivard, 1985.

Figure 10

decades of large rice imports despite rapid adoption of HYVs and irrigation, as well as chemical fertilizers and pesticides in the case of Indonesia. Agricultural production systems do vary tremendously between the densely populated inner islands in which intensive wet-rice cultivation predominates (e.g. Java and Luzon), and the labor-scarce outer islands where slash and burn systems are utilized. The degree of technological change and land scarcity also varies correspondingly. Especially in Indonesia, the sparsely populated outer islands will absorb most new entrants in the agricultural sector, including those brought in by transmigration programs.

Women are highly visible in the farm and nonfarm sectors in both countries. In Indonesia, women have withdrawn from agriculture more slowly than men and have entered the nonagricultural labor force more rapidly, resulting in rising female shares of employment in both sectors. The fast decline in the percentage of the female labor force employed in agriculture is especially striking: whereas in 1971 the figure was 63%, by 1980 it dropped to 54%. In contrast, women in the Philippines have held a constant share of about 25% of farm jobs, including 26% of family workers (self-employed and unpaid) and about 20% of hired hands. Female labor force participation in the Philippines has been decreasing over the last three decades, more pronouncedly in rural areas where female unemployment is twice that for males, despite steady female migration to towns and cities (Castillo, 1976). Female labor force participation has not changed as much in Indonesia, and rural-to-urban migration is not common among women. More than half the female labor force is underemployed, spending less than 35 hours per week "working" because of their multiple productive and reproductive tasks (World Bank, 1989). The comparable figure for men is 30%. There are also wide regional variations in female labor force participation. In Yogyakarta (central Java) for example, the 1980 census reported 51% female labor force participation, while in South Sulawesi, it was only 17% (UNICEF 1984). Although the formal labor force participation rate seems high among women in Indonesia, an even larger percentage of the female population is categorized as unpaid family labor.

Although the major source of employment for rural Filipinos is farm production, only a minority own the land they till. Most are either tenants on marginal land, or landless or near-landless agricultural workers, and women's participation in agricultural production thus depends largely on the household's access to land and on the type of crops grown. Paddy production in some areas offers opportunities for women's wage work, especially in transplanting and harvesting operations, while coconut growing offers the least. Women have also comprised nearly half of all workers in industry and services in the Philippines since 1960, when large-scale female rural-to-urban migration was beginning. Although there is an excess of males over females in the rural Philippines (and a

corresponding excess of females in urban areas), the sex composition of the farm labor force has held steady in the face of disproportionately female outmigration. In contrast, women outnumber men in both rural and urban areas in Indonesia. In Java, seasonal male rural-to-urban migration is the predominant pattern. Men leave villages for up to six months at a time to take up wage employment in urban areas, usually in the informal sector. Remittances from migrant earnings comprise an important and growing source of income for women and children remaining in rural households, and may contribute significantly to improving their standard of living.

Despite the tremendous growth in the industrial and service sectors over the past decades, agriculture is still the key sector in Indonesia (see Fig.9). The growth in agricultural production since 1970 has been based on the expansion of irrigation, use of high-yielding seed varieties (HYVs) and subsidized fertilizers and pesticides. Accompanying technological change has tended to be labor-saving, resulting in a decline in the proportion of the labor force engaged in agriculture. A large percentage of this displaced labor, if not the majority, has been female (Sajogyo et al. 1979). The disproportionate affect on women is the result of the traditional gender-specific division of labor in agriculture combined with modern technologies which reduce labor requirements in rice harvesting and processing activities, where women have traditionally been employed.

The most striking consequence of agricultural modernization on women's work has been that of mechanization, particularly of post-harvest processing operations. As HYVs became widely adopted in Indonesia, harvesting shifted from the female to the male domain. The reason for this change was that traditional varieties, which mature unevenly, were cut by women using light, hand-held knives, while evenly maturing modern varieties were more efficiently harvested with heavy steel sickles, which required greater upper body strength. (Collier et al. 1973) The labor requirement was thereby reduced from two hundred female labor-days to seventy male labor-days. In the Philippines, women continued harvesting after the sickle was introduced, but much less than with the traditional technology. Similarly, the adoption of rotary weeders in Java converted weeding inputs from twenty female days to eight male days (Pyle 1985), and with the mechanization of rice husking, hullers substituted for 125 million labor-days for women, which had provided an estimated \$55 million in income for about one million women in 1983 alone. The introduction of the mechanical mini-thresher in the Philippines substantially reduced women's share of labor in that operation. Furthermore, in upland and rainfed areas, HYVs have allowed direct planting, thereby eliminating the transplanting stage carried out by women. In one such village, the contribution of hired female

labor to total labor inputs* decreased by 18%, while male wage labor inputs more than doubled (Banzon et al. 1987). In areas which still adhere to the less risky method of transplanting, the use of tractors has freed up male family labor from plowing, labor which was then used instead of hired female help in transplanting. In addition to increased male inputs in planting and seedbed preparation (due to double cropping), the extension of the harvesting season over a longer time period has allowed surplus male labor to partially substitute for women's labor in traditionally female operations in many parts of the Philippines (Res, 1986).

The consequence of large-scale female labor displacement has been reduced productivity of women workers, and that they more or their time must be devoted to meeting subsistence needs. Former rice-pounders in Java subsist by subdividing available jobs, thereby increasing the labor intensity and further reducing wages. In central Luzon, displaced women workers end up in marginal agricultural operations such as catching hay during mechanical threshing. Traditional self-employment opportunities in petty trade, vegetable production, food processing and pig raising, are open only to women from upper-income groups, unless others are able to obtain credit from relatives.

The impact of HYVs in outer islands of Indonesia and the Philippines has been minimal because of unsuitable soil and water conditions. Where double cropping with modern seeds has been tried, women's labor did increase, but returns are low due to the lack of pest control and other environmental problems. These experiences are evidence of the need for adapting new techniques to specific microenvironments. Women in Kalimantan interviewed by Watson (1985) also felt that hand-pounding of rice was overly tedious and time consuming, and that the 10% tariff for mechanical milling was worth the labor saved. Clearly, the impacts of a specific technology vary according to the conditions within which it is applied.

The female share of the manufacturing labor force has grown rapidly in both countries since the 1970s. They now represent almost half the workers in the manufacturing sectors, but they tend to be concentrated in textiles and garments, and manufacturing industries still absorb less than 10% of the total labor force. The abundance of cheap female labor in both countries has attracted some multinational firms in the electronics industries who employ thousands of young women at very low wages, just as in Malaysia and to a lesser extent, Thailand (Eviota, 1986). In the Philippines, a large number of women are also employed in the food processing industry: women are about half the

* for the wet-season crop

workforce in poultry processing, and in some fruit and vegetable packing/processing facilities, they are up to 70% of employees and outgrowers (E&Y, 1990). It is the service sector, however, that provides the most important source of employment after agriculture. In fact, the declining share of agricultural employment over the past decade is roughly matched by the expansion of service sector employment. Women predominate in the urban informal sector as domestics and self-employed or unpaid family workers in petty commerce, such as hawking and street vending. Working long hours for low returns, most have little education and no other means of survival.

Indonesian women are less likely than their Filipina counterparts to be absorbed into the industrial sector, which is growing rapidly but accounts for only 20% of all employment in Indonesia. Women's participation in trade, and to a lesser extent services, has increased over the past two decades, but has been largely confined to the rural informal sector and their productivity and income have decreased with the forced shift out of agriculture. Women also engage in semi-wage labor through the "putting out" system, where they do piece work in the home for extremely low remuneration (Collier et al., 1973). There are also greater numbers of women involved in trading (an estimated 40% of Indonesian women can be classified as small traders). Market activities which women typically engage in include food and drink preparation and preservation, brown sugar production, coconut oil extraction, and herbal medicine preparation. It is clear that income-earning opportunities are highly limited for most Indonesian women, and there is indeed an oversupply of women traders in some markets.

Government policies in place during the '60s and '70s directly or indirectly contributed to some of the changes discussed above. In Indonesia, subsidized interest rates made capital investment more attractive and thereby encouraged the use of rice hullers, and to some extent rotary weeders. This policy accelerated female labor displacement. The small-scale mills that became popular were the most economically efficient (Timmer, 1971), and their use created more labor than the larger, capital-intensive integrated mills (which perform mechanical drying in addition to husking), but jobs in the mills were given almost exclusively to men. Both countries also invested vast amounts in programs to provide HYV seeds to farmers and expand irrigation facilities, but women were generally overlooked by extension agents and planners.

Indonesia has undertaken two stabilization programs since 1982, which have included financial sector reforms, the elimination of import restrictions and tariff reductions, a major devaluation of the Rupiah, and the relaxation of foreign investment regulation. These steps have helped increase overall

economic growth, but especially in export-oriented manufacturing where increases in women's employment have been enormous. In the Philippines, manufacturing has grown more slowly because of continued restrictions and tariffs on imported inputs and an overvalued exchange rate, among other things. These policies have also inhibited growth of non-traditional agricultural exports, where promising income-earning opportunities exist for women. It is expected that in the packaging and processing operations, women will receive a larger share of new jobs than will men.

EGYPT AND YEMEN A.R.*

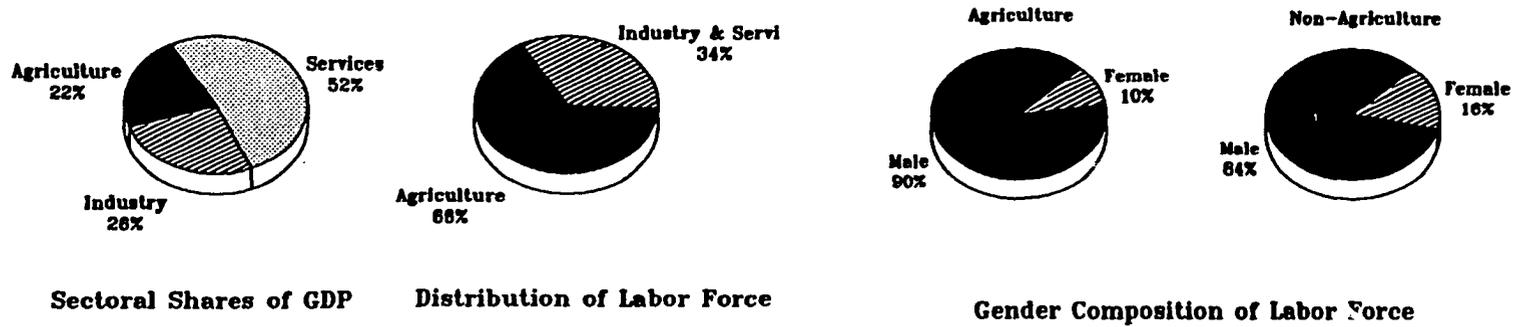
Egypt and Yemen A.R. constitute the final group of middle-income transitional economies as defined by the ANE strategy criteria. The key difference between these countries and the others in the same category is that agricultural exports constitute an extremely low proportion of all exports (2% and 10% respectively in 1988). Both countries are petroleum exporters, with the value of cotton and rice exports in Egypt and qat[‡], coffee, cotton and hides in Yemen piling in comparison. They both experienced rapid growth in the 1970s, led by large infusions of foreign exchange from worker remittances and foreign aid, and in Egypt's case revenues from petroleum and the Suez Canal were also significant. Lower oil prices and smaller remittances of the 1980s had grave economic impacts. Egypt maintained high growth levels at the expense of its balance of payments and debt situations. Yemen's economy slowed down in the early 1980s also, but the end of a severe drought and start of gas and oil production triggered another round of growth in 1986. Remittances to both Egypt and Yemen continue to drop while unemployment increases with the return of migrant workers. Only 3% of Egypt's land is arable, therefore population densities in rural areas are comparable to Indonesia and Bangladesh, but unlike those countries, nearly half of the Egyptian population resides in cities. Yemen is still predominantly rural, with less than a quarter of the population in urban areas.

Egypt and Yemen also share a pattern of low female visibility in the labor force, although the statistics are rather suspect. With declining rates of male agricultural activity in Egypt, for example, the already low female rates may have dropped or increased, with the resulting female share of farm employment either remaining constant at about 4% (ILO) or rising to 20% (recent labor force

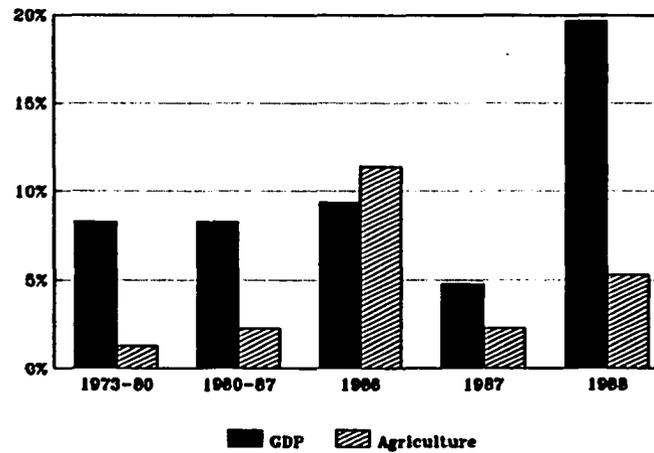
* Although the discussion so far has considered the two Yemens as one country, the review in this section is based on information specific to the Arab Republic of Yemen.

‡ a lucrative cash crop whose leaves are chewed like tobacco.

YEMEN A.R.



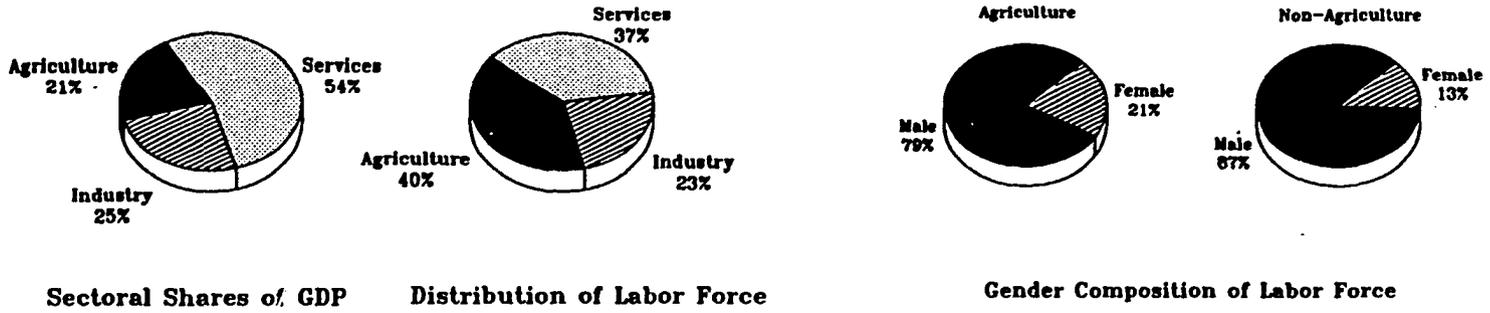
Annual Growth Rates



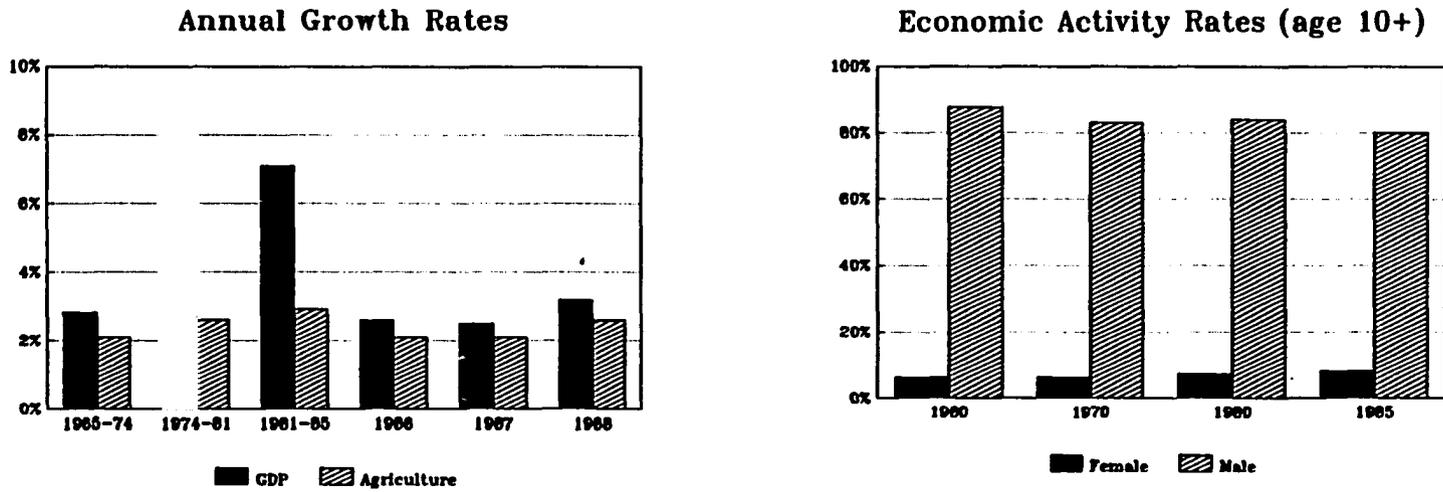
Sources: World Bank, 1989, 1990; ILO, 1986.

Figure 11

EGYPT



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Sources: World Bank, 1989, 1990; ILO Yearbook of Labour Statistics, 1984; United Nations, 1989.

Figure 12

surveys), or perhaps steady at 20% all along*. While the agricultural sector may or may not be absorbing more female labor in Egypt, the low but rising rate of female participation in industry and services appears to have raised women's share of these jobs from about 8% to 16% since 1960. The service sector absorbed 65% of the growth in female employment during 1960-70, but it was nearly all in the informal sector. The reason behind the Egyptian service sector's prominence in absorbing female labor is two-fold: it is the largest of the three sectors and contributes the greatest share of GDP, and it also offers a fairly wide variety of employment, unlike the manufacturing sector which only attracts a small segment of the workforce. Women comprised 8% of manufacturing workers in 1983, but over half were found in textiles, clothing and leather. The pattern in Yemen is somewhat similar, with female shares of agricultural employment apparently rising from about 5% to 10% between 1960 and 1980 (although the Census of Agriculture conducted between 1977 and 1983 found that half of all labor from landholding families was female), largely as a result of male outmigration to oil-producing states (Howe, 1985). The majority of economically active women work as unpaid family labor in agriculture, and female labor force participation is at least five times higher in rural than urban areas (more so if seasonal agricultural workers are included) (Hashem, 1990). The female share of nonagricultural jobs rose from about 3% to 15% during 1960-80; in 1986, the single largest employer of women in the formal sector in Yemen is the government, followed by a Chinese-owned textile factory in Sana'a; most women workers in this factory are household heads as a result of divorce, widowhood or migration (Hamman, 1986). Higher status urban jobs tend to be filled by expatriate workers, both men and women, who possess better educational qualifications than most Yemenis (Howe, 1985).

Migration in Yemen has been higher from rainfed subsistence areas where land preparation,

* There is good reason to suspect that at least one-fifth to one-quarter of the farm labor force is female despite the lower estimates of 2-5% derived from censuses of 1960 to 1980. First, the female share of all agricultural employment reported in national Labor Force Surveys of 1983 and 1984 has been 17% and 21%, respectively. Secondly, the Agricultural Census of 1960-61 counted a farm labor force of 6.6 million persons, 20% of them female (compared with the 1960 population census of 3.7 million of whom only 5% were female). Among hired workers, 14% of permanent workers and 31% of casual laborers were women. Third, a national Labor Record Survey of 1964-65 found that one-quarter of all productive work in farm households was done by women, concluding that about one-quarter of working age rural women should be classified as unpaid family workers in agriculture, 4% as farm wage workers, and another 4% as economically active outside of agriculture (Hansen, 1969). Women are significantly more visible among farm workers in the Delta region than in the more culturally conservative regions of Upper Egypt. On family farms, women (and children) specialize in post-harvest processing and the care of poultry and livestock within the household compound. They also tend to be underreported in labor force statistics because census takers and even women themselves often consider them housework rather than economic activities in their own right. Fourth, a survey of villages in three different cropping systems of the Delta done in the early 1980s found that women constituted from 28% to 38% of family farm labor, depending on farm size, and from one-fifth to one-third of hired labor (Richards and Martin, 1983).

especially terrace and stone wall construction, require large male labor inputs. The increased cost of male labor in these regions, coupled with higher incomes, has led to the removal of large amounts of land from cultivation, and consequently reduced women's work burden. In some parts of the highlands, tube well irrigation has been introduced, and marginal or uncultivated lands have been converted to cash crop production by women (RRNA, 1989). In more fertile areas, expansion of qat has increased women's agricultural work even where migration is only moderate. The gender division of labor has also weakened with the male labor shortage, as women laborers are hired to work in irrigation. In one village, women from 15% of households participated in wage labor, while the majority (75%) worked on their own fields and enjoyed a reduced workload because of mechanization of threshing and grinding and installation of gas stoves, which eliminated the need for fuelwood (Palmer, 1985). Egypt is also a major exporter of male labor to wealthier oil-producing states, but the impact of male migration on agriculture appears to be less significant. A much larger supply of male wage labor, highly productive irrigated cultivation systems, and migration mainly from extended families all work to prevent major labor shortages. It has also been observed that migrant nuclear families break away from their extended families, and in those cases remittances may be used for productive investments such as livestock or tractors. Sometimes the nuclear family will sell its land and abandon agriculture altogether, in which case women frequently use remittances for capital to start up a microenterprise (Palmer, 1985).

In Egypt, a few critical government policies have encouraged the shifts out of agriculture by both male and female labor. Agricultural productivity has not been able to keep up with population growth, and per capita food production declined during 1960-80 (Adams, 1985). By 1985, food imports were costing \$4 billion. Stagnating yields are blamed on the government's neglect of the agricultural sector; Egypt is endowed with extremely fertile soils and favorable climatic conditions. Apart from a seed subsidy, the government's efforts at promoting agricultural development have been limited to meager investments in research and extension. Although many observers agree that there is a labor surplus in most of rural Egypt, government policy in the 1980s promoted farm mechanization as a means of raising productivity and incomes despite its potential effects of labor-displacement and accelerated urbanization. Recently, area allotments and delivery quotas at low prices have been eliminated for most crops, thus raising prices received by producers. The government is also encouraging private sector marketing and processing of agricultural products, and the removal of several import and export restrictions has also allowed proper price incentives to be transmitted to farmers.

Government interventions into the Yemeni economy are limited, but macroeconomic and investment policies are tightly managed. When worker remittances declined and agriculture suffered due to severe drought in the early 1980s, the government responded by launching a major stabilization program. It consisted mainly of successive devaluations, cuts in public expenditure, a government wage freeze, and import restrictions. One outcome of this increase in import prices (including food), together with normal rainfall and the return of male migrants, was a sharp increase in agricultural production. In 1986 agriculture grew by 11%, compared with 1.3% p.a. during 1980-85. Since there is no evidence of labor-saving technologies being widely introduced, it is likely that large increases in both male and female labor inputs on expanded cultivated area were responsible for this boom. Furthermore, imported inputs such as fertilizers, chicken feed, and livestock vaccines became more readily available. Until financial and monetary reforms are implemented, however, neither credit nor savings will be available to make necessary investments, and agricultural productivity will remain low.

I.B.3. Low-Income Agricultural Economies

Bangladesh and Nepal suffer from a combination of circumstances that hamper their ability to achieve rapid growth. Limited natural resources, high population growth, weak infrastructure and a largely unskilled labor force are major obstacles to development. External assistance plays a large role in both economies. They both depend on agriculture for about half of GDP and as the primary source of employment (Figs.13, 14). Exports of rice, jute and other agricultural products from Nepal* and jute, tea and leather from Bangladesh account for about 30% of their respective export earnings.

Despite their similarities, two distinct patterns of female labor force participation are represented by these countries. Bangladesh shows low female participation in both agriculture and non-agriculture. Official statistics for Bangladesh appear to ignore most women working in agriculture as unpaid family helpers or hired hands, however. Whereas the 1984-85 Labor Force Survey enumerated only 8% of all women as economically active, for example, a recent UNDP/UNIFEM survey estimated total female participation at 45%. Official figures for Nepal are

* Although rice has historically been the most important agricultural export in Nepal, data for 1987 and 1988 indicate that rice exports are far smaller than exports of vegetable oil and oil crops, feed products, vegetables, fruits and nuts and live animals (USDA, 1990).

probably more realistic, revealing a pattern of high female participation in agriculture and lower participation in other sectors. Nepal and Bangladesh both display the common South Asian pattern of a surplus of men in both rural and urban areas, combined with predominantly male migration to cities.

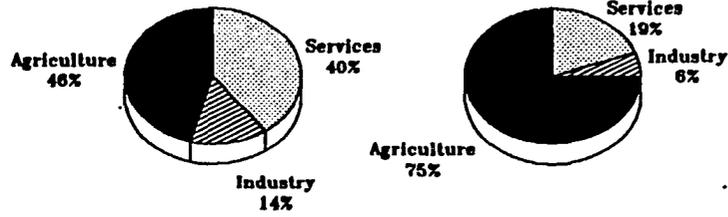
BANGLADESH

Geographically and culturally, Bangladesh is fairly homogeneous apart from the hilly southeastern region where tribal communities reside. Even though soil and rainfall conditions are highly favorable, agricultural production fails to meet the country's food needs, given that rural population density is the highest in the world. Landholdings are highly fragmented and average holding size is small. Rice and jute occupy most cultivated area.

Only 16% of cropped land uses any modern inputs, i.e. high-yielding varieties of seeds (HYV's), chemical fertilizers and pesticides, and mechanical irrigation (Abdullah, 1985). In areas where HYV's are used, small farmers and sharecroppers are found to have adopted the new strains to at least the same degree as large surplus farmers, if not more so. One explanation offered for this pattern is the accessible location of irrigation facilities, which have been supported by the government; because farm holdings are generally fragmented and scattered randomly, it is unlikely that an irrigation pump could be located anywhere that access would be restricted to only a few farmers (Hossain, 1988).

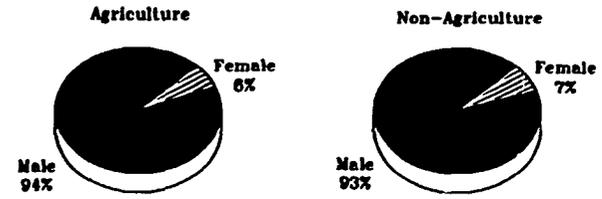
The mechanization of rice husking and polishing in Bangladesh and the resulting displacement of female labor have been well documented. Although most rice has traditionally been husked by unpaid family workers, a significant portion of output is still husked by hired female laborers who come from the poorest 5% of households (Scott & Carr, 1985). Income earned from husking has been found to contribute over half these women's annual incomes and up to 15% of their families' incomes (Begum & Greeley, 1980; Scott & Carr, 1985). With the arrival of subsidized electricity to the countryside, investment in mechanized rice-husking mills soared. In one area, for example, the number of mills jumped from 4 to 18 within a year after connection to the electricity grid, and it is estimated that 40% of the national rice output is now processed in mills (Scott & Carr, 1985). The attraction of utilizing mills is that they can husk and polish rice more cheaply and in less time than traditional methods, so owners are able to charge low prices and still make substantial profits.

BANGLADESH



Sectoral Shares of GDP

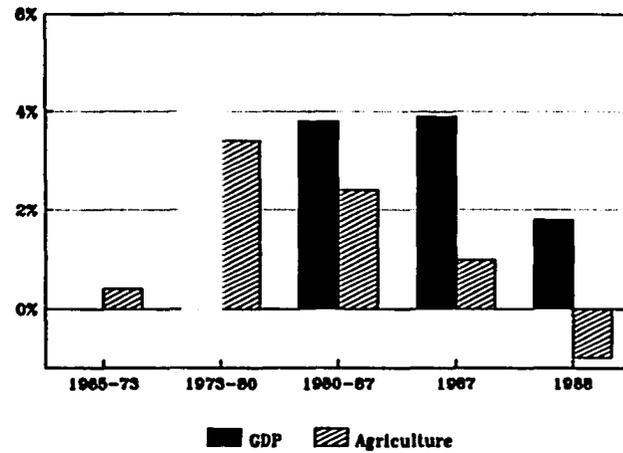
Distribution of Labor Force



Gender Composition of Labor Force

44

Annual Growth Rates



Economic Activity Rates (age 10+)



Sources: World Bank, 1989, 1990; ILO, 1986; Sivard, 1985.

Figure 11

Farmers who are most likely to use the mills are those who have traditionally relied on hired female labor to carry out most of their husking. Begum and Greeley's (1980) study determined that close to three-quarters of all farmers who used rice mills had previously employed female labor for husking, and had together comprised two-thirds of employers to those women.

Although mills are not yet the predominant method of husking, there were approximately 10,000 mills in place in 1985, which had resulted in the loss of part-time employment for 1.4 to 2 million women. It has been estimated that new mills will appear at the rate of 700 per year, resulting in the displacement of up to 140,000 women annually (Scott & Carr, 1985). Most studies focus on the magnitude and extent of this displacement, not the consequences of unemployment for these women.

Apart from requiring commercial inputs, HYV rice cultivation demands much more labor for weeding and irrigation. Small farmers' usual response to the problem is to work harder and longer in the fields, and to demand the same of their sons (Ahmed, 1987). As Whyte and Whyte (1981) point out however, "the labor exigencies of high-yielding crop varieties, particularly the concentration of activities at peak time, are believed to have caused more women to abandon seclusion to work on the family plot." Women working in the fields alongside their husbands and sons is a radical departure from the norms that have traditionally dictated labor segregation. Combined with the considerable time-savings in processing activities (HYV's require less time per unit output for drying, parboiling, husking and winnowing than traditional rice varieties), HYV's have dramatically altered women's roles in rice production where planted. Once family incomes increase beyond a certain level, however, either due to higher wages or larger crop yields, the household may choose to withdraw women and children from wage labor and other productive activities (Hossain, 1988).

Manufacturing contributes only 7% of GDP, and women represent one quarter of its labor force. Their shares of employment have risen dramatically in a few major industries, particularly textiles and clothing, where most of the urban female workforce is found. Women also make up a large share of workers in shrimp processing and tea industries, both export-oriented. Four-fifths of industrial workers in Bangladesh are employed in small-scale industry, e.g. weaving, handicrafts, and oil pressing, where the average enterprise size is less than four persons. Women make up over a third of the workers in such enterprises, and the majority are unpaid family workers. They are also concentrated in those activities with the lowest returns to labor, such as in the production of lime, coir rope and fishing nets. A recent study of the handloom industry found that women's share of em-

ployment is increasing there, but only in firms operating pit-looms; where semi-automatic looms are used, the percentage of women is declining. It was also shown that the larger the enterprise as measured by number of operating looms, the greater the tendency to hire full-time male workers (World Bank, 1990b).

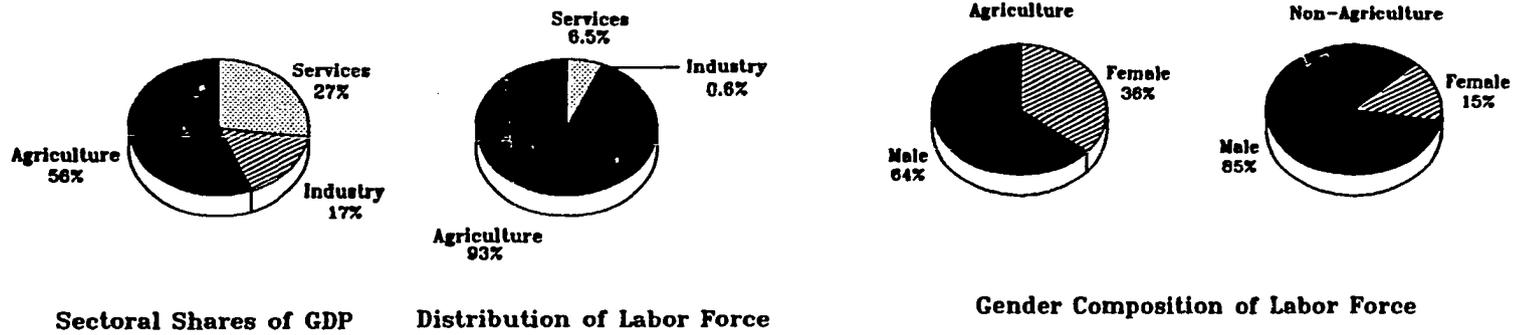
Government programs in agricultural research, extension and irrigation have yet to fully take into account the contributions women make to agriculture or the impacts of agricultural transformation upon them. Subsidized electricity has encouraged mechanization of agricultural processing operations, which is both economically inefficient and displaces female labor. Trade policies which restrict and tax both imported inputs and exported outputs, together with an obstructive regulatory framework, discourage expansion of export-oriented industry that could potentially employ large numbers of women. There is some uncertainty, however, regarding the stability of such employment, as revealed by the severe effects of U.S. and EEC quotas on the garment industry in 1986.

NEPAL

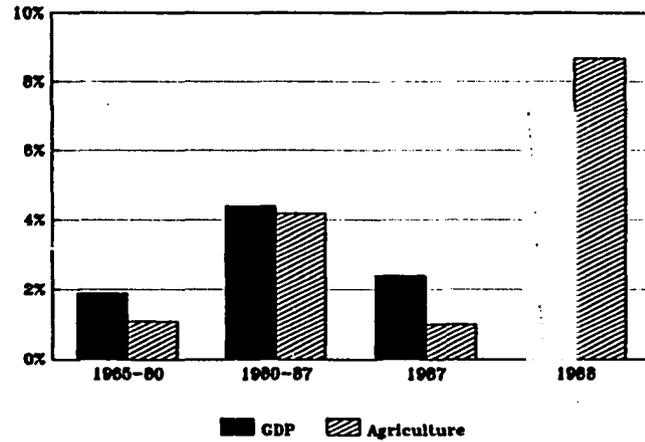
Nepal is a predominantly subsistence economy, with 93% of the population engaged in agriculture. Even among relatively well-off households, a large proportion of income is generated from within the household, which is characteristic of most foodgrains-based agricultural economies (Acharya and Bennet, 1982). Nepal's primary source of foreign exchange is tourism, followed by manufacturing, mainly carpets and clothing, which still contributes less than 5% of GDP. Women comprise about 20% of the workforce in both industries. Manufacturing still contributes less than 5% of GDP. The country has three distinct ecological zones which each run across the country from east to west. The southern strip near the Indian border is fertile flatland (terai); the central zone is hill area; the northern region is mountainous. Rice is the single most important crop, particularly in the terai, and it is also the primary staple in many other areas.

The Terai is heavily reliant on irrigation and HYVs for high productivity, unlike the central hill areas which are characterized by a production system in which output is a direct product of labor input. Cropped area increased tremendously in the hills between 1975 and 1983: total area under paddy cultivation expanded by 30%, wheat by 50%, and maize by 10%. Corresponding yields declined during this period, by over 20% for both paddy and maize (Kumar and Hotchkiss, 1988). The causes behind these trends lie in increasing population pressure, which forces expansion of cultivated area

NEPAL



Annual Growth Rates



Economic Activity Rates (age 10+)



Sources: World Bank, 1989, 1990; ILO, 1986; Sivard, 1985.

Figure 14

to ensure that minimum consumption needs are met, which in turn requires greater labor inputs that are only partially met by the growing labor force. Thus, land productivity in the hills actually decreased.

Of the three sectors of the village economy, family farm production (including processing and domestic activities), local market activities (wage labor, trade, manufacturing), and migrant labor activities (requiring at least one night outside the village), women's participation is highest in the first. In the eight communities surveyed by Pradhan, 67% of time devoted to family farm production was contributed by women, compared with 40% of local market activities and 19% of migrant labor time. In a separate eight-village study, Acharya and Bennet (1982) found that women comprised over one-third of all those who had taken employment outside the home. The proportion of women's time devoted to each of the three sectors varies between regions. In the semi-arid hills where the main crops (barley, wheat, and buckwheat) require irrigation, water was a constraint preventing agricultural expansion. With a short growing season and low yields, these areas required all family members to seek outside employment in order to meet subsistence needs. In non-irrigated terrace areas, rice cultivation is impossible and the primary crops are corn, barley and wheat, and in places also potatoes. The scarcity of water, together with deteriorating environmental conditions, have similarly prevented expansion in these regions. In one community, half the population did not own enough land to meet subsistence needs, while another third were producing just barely enough for subsistence. In contrast, demand for labor in the rice-growing Terai rises during June-September, when labor migrates in from the central and northern hill areas.

There appears to be some correlation between the level of female exclusion from non-household activities and religious conservatism. In communities where orthodox Hindu traditions are dominant, women's participation in the local market economy accounted for 25-30% of their time, whereas in communities far less influenced by Hindu orthodoxy, the share was 40-69%. More strikingly, the respective shares of women's time spent in employment outside the village was 3-7% and 34-46%*. Women from less conservative communities were found to be more entrepreneurial, earning cash through beer brewing, trading, providing lodging, and clothing and carpet production. Although the degree of social conservatism is an important variable in determining female participation in market activities (as are caste and ethnicity), the overriding factor is local agricultural

* Women who migrate from employment tend to belong only to the lower castes; Davenport et al. (1986) found that in some hill areas, over half the lower-caste women are migrant laborers.

productivity (Davenport et al., 1986). It so happens that those areas where productivity is lowest, i.e. the high hills, are where orthodox Hinduism has had the least influence, in large part due to their geographic remoteness. The areas where the male-female labor dichotomy was the sharpest were those with richer soils, greater water availability, and in which rice is the main crop. Furthermore, it has been found that greater participation in market activities, not agricultural production or household work, improves women's control over household resources (Acharya and Bennet, 1982).

Mechanization and improved seed varieties have had limited effect on Nepalese agriculture and have been confined to the Terai. Studies show that except for land preparation, labor requirements increase with the use of high-yielding varieties, especially for weeding, harvesting and threshing. Therefore, women's workload rises substantially with HYV adoption, particularly since they require more careful and timely weeding throughout the growing season. Where chemical fertilizer has been adopted, however, the task of fertilizer application has shifted from the women's to the men's domain, because extension services have neglected traditional labor patterns and focused solely on male farmers. As a result, women's economic contribution has actually been reduced, which in turn has had adverse effects for household income and agricultural productivity.

Kumar (1988) shows that agricultural productivity in hill areas is reduced by deforestation, which causes women to spend more time fetching fuelwood and fodder and less time in agricultural production. Because women's ability to further increase their workload is limited, and because substitution between male and female labor is minimal, a female labor bottleneck arises. In highly deforested areas*, women were found to spend 50-60% more time in fuel collection than in low deforestation areas, which on average took 1.5 hours of female labor away from agriculture per day. Since output in these areas directly depends on labor inputs, this reduction is reflected in a lower volume of production. There was some increase in (male) wage labor use in high deforestation areas, but it was not sufficient to compensate for the loss of female labor (deforestation was not a significant determinant of the degree of wage labor use). Although male out-migration can exacerbate the productivity declines brought on by deforestation, high deforestation areas had fewer permanent and seasonal migrants. Deforestation also leads to increased erosion on non-cultivated lands, since fodder shortages encourage grazing of livestock over stall-feeding. Consequences were most severe in the dry season, when fuel and fodder needs are the greatest and when crops (wheat, maize and mustard) required the most female labor. For wet-season crops (rice, millet), male labor

* Deforestation being defined as a 1% increase in time required for collection of one unit of fuelwood.

availability was as important or a greater constraint to productivity.

I.C. Growth Strategies and the Movement of Labor Out of Agriculture

As described in one of the background papers to the ANE strategy (HIID, 1988), the structural transformation model involves both rapid agricultural growth and a declining contribution of agriculture to national output. There are at least four stages in this linear model:

- I. Agricultural productivity increases, raising rural incomes and generating an economic surplus in the sector.
- II. The surplus is then tapped to develop the non-agricultural sectors, which begin to draw a growing share of the labor force.
- III. Resources move out of agriculture as rural and urban factor and product markets become integrated (through infrastructure and marketing linkages). By this stage, attention to the sustainability of agricultural production must be addressed if it has been so far neglected.
- IV. Agriculture is completely integrated into the economy and contributes a fairly small portion of GDP.

Although many of the countries have not strictly adhered to this sequence, the ANE strategy considers a country's stage of development in identifying priority areas for investment. Therefore, the low-income countries (Bangladesh and Nepal) which are clearly in the earliest stage of transformation require emphasis on expanding cereal production, and on laying the foundation for agricultural diversification and labor shifts into industry and services. Among the middle-income transitional economies, the degree of transformation (based on agriculture's share of GDP) roughly corresponds to geographic groupings. The South Asian countries (India, Pakistan, Sri Lanka) are either in the process of generating an agricultural surplus or beginning its transferral; Indonesia and the Philippines are beginning to integrate rural and urban markets; Egypt and Yemen lead the group with slightly lower shares of GDP in agriculture, but this has been due to large oil revenues and remittances. Agricultural diversification and greater food security are among the main objectives for the transitional economies. The middle-income industrializing countries are all at a stage where rural and urban markets are yet to be fully integrated, with Thailand and Morocco showing the same reliance on agriculture, and the remaining countries (Tunisia, Jordan, Oman) being furthest along in the transformation, having benefitted the most from the regional oil boom.

Each country's position along the spectrum of structural transformation, together with

characteristics such as natural resource endowments, educational level of the workforce, and the degree of infrastructural development, will determine where emphasis should be placed within a coherent national development strategy. Depending on these strategic priorities, certain aspects of women's roles in agriculture and overall development must be understood in order to maximize their contributions to growth and facilitate the transformation process while minimizing the adverse impacts of economic adjustment. Variations across and within countries in the patterns of women's economic activities as described in the preceding sections, and in the changing division of labor in agriculture, are highly relevant to the achievement of A.I.D.'s food systems strategy for growth in the 1990s. The movement of workers out of agriculture (in relative if not absolute terms) and into industry and services is a dynamic indicator of the gender-differentiated demand for (and supply of) labor in each sector. Because the process takes quite different forms in different settings, the key differences are summarized here as they relate to the growth strategies identified for the three groups of countries in the ANE region.

I.C.1. Low-Income Agricultural Economies

For these countries, the ANE strategy emphasizes increasing basic agricultural productivity (especially of cereal crops) and improving the efficiency of support services such as irrigation, transportation, and seed and fertilizer supplies, and technical assistance. Small, targeted programs are suggested for producing and processing selected high-value agricultural exports. How are gender differences in the movement of labor important to achieving these objectives?

Women are responsible for several critical steps in cereal production and processing. In Bangladesh, where there is still great scope for HYV adoption, evidence suggests that the strict gender division of labor may in fact be modified as labor requirements grow with the spread of modern seed varieties. Where women are already responsible for the bulk of processing activities and more women are expected to be performing field work (as family and hired labor), research and extension efforts should include them if productivity is to be maximized. At the same time, landless and near landless women who are increasingly displaced from processing work because of mechanized rice threshing and hulling need to be incorporated into productive employment in rural areas, either on or off the farm. Migration to cities is not an option for most rural women (except widows or those divorced or abandoned by their husbands) because most rural women marry early, have limited education and skills, and the demand for their labor in cities is generally low. There is a crucial need

for rural women to find income-generating employment in small, agro-based industries close to home. Landless women are prime candidates for employment in the production of silk fibers, fruits, nuts, vegetables, and livestock and poultry products, once urban or export markets have been clearly identified.

In Nepal, rice production in the Terai has already experienced gains from HYVs and irrigation, but rice and maize yields in the central hill areas have been declining since the 1970s. Therefore, it appears that the hills would be target areas for increasing productivity, though not necessarily of cereals. Agro-ecological conditions in some hill regions, compounded by the lack of irrigation, may make cereals less suitable than coarse grains or tree crops. In the long run, perhaps a strategy of regional diversification would be appropriate for Nepal, where cereal production would be limited mainly to the Terai. Experiments with export crops grown in the hills, such as apples, can provide an important source of income for women if they are processed, dried and packed on site rather than being carried out in bulk form which poses major difficulties of transportation and storage. Reaching female farmers directly with inputs and marketing assistance rather than through male "household heads" is key to a successful growth strategy in Nepal. Until the necessary infrastructure is in place, however, complete integration of the two regions will be impossible. In the meantime, some resources must be devoted to increasing cereal production in the hills. With high rates of seasonal male outmigration, women carry major responsibility for subsistence cultivation in the increasingly deforested hill areas. A strategy of raising cereal yields and protecting natural resources must clearly be aimed at improving the flow of support services and incomes directly to women. As one study concludes, women's time constraints present a bottleneck in these labor-scarce systems (Kumar, 1988). Irrigation schemes may be infeasible or too costly a means to increasing productivity, but agro-forestry programs or simple household technologies offer options for partially freeing women's time from fuelwood collection or domestic tasks.

In both countries, investments in infrastructure development will improve access to markets for small-scale rural enterprises and lay the groundwork for future diversification out of cereals. Rural works projects in Bangladesh have been shown to produce highly positive income effects (Ravallion, 1987), and can be a significant source of employment for landless women. In those areas of Nepal and Bangladesh where agricultural incomes are rising or urban and export markets are already accessible, small-scale agro-processing enterprises should be promoted, as described below for the South Asian transitional economies.

I.C.2. Middle-Income Transitional Economies

The role of agroprocessing is heavily emphasized in the strategy's objectives for middle-income transitional economies. While growth in agricultural productivity must be maintained, substantial new employment opportunities emerge from the rising demand for meats, fruits and vegetables, dairy products, bakery items and other processed foods resulting from higher average incomes. Currently, agriculture is the major employer of women in all countries, followed variously by manufacturing (India and Sri Lanka), marketing (Indonesia and the Philippines), or professional and clerical occupations (Egypt). (Recent occupational breakdowns are not available for Pakistan or Yemen.)

Among this group, the South Asian countries have undergone the least transformation. Sri Lanka is well ahead of India and Pakistan, having taken a strong export orientation in agriculture since 1978. Although there has been an observed decline in agriculture's share of the labor force in India and Pakistan, it has been the "push" of fewer opportunities in agriculture rather than any "pull" factors which lead men to seek employment in other sectors. In regions of India and Pakistan that have not benefitted from Green Revolution technologies, priorities ought to be the same as those in low-income countries with similar agro-ecological conditions and labor availability. Again, women's roles in cereal production and processing are critical to achieving growth in such areas. In the more prosperous rural areas small-scale agro-enterprises that are generally operated by landless women can be further promoted. Infrastructural development must also be emphasized in order to link rural areas to urban and export markets for high-value crops, particularly in India where vast distances have historically prevented integration. Access to markets can provide opportunities outside agriculture to landless women in the poorest areas. Programs aimed at promoting livestock, vegetables and other high-value agricultural products will clearly have to ensure that inputs and credit go directly to women, given that women are often responsible for secondary farm activities. Women's labor will indeed be vital to agricultural diversification, which can be seen as an intermediate step between the decline of income-earning opportunities in cereal production and the permanent exit out of agriculture (HIID, 1988).

Indonesia and the Philippines are somewhat further along in the transformation process. Except for some of the outer islands, cereal productivity need not be the overriding concern for agricultural growth. Neither country has been successful, however, in raising rural incomes to the point where labor and resources are "pulled" away from agriculture. Like India and Pakistan, declining shares of the labor force in agriculture are mainly a result of fewer opportunities. Unlike

South Asia, it is particularly so for women, who are forced into low-wage or low-profit informal sector activities. In Indonesia, a large proportion of rural women engage in rural microenterprise, making them central to the expansion of agro-processing activities. Further development of infrastructure and marketing systems may be necessary to completely integrate these women traders into the national and international markets. In the Philippines, rice price stabilization and removal of industrial protection policies are likely to be necessary components of a viable growth strategy. If implemented together with policies aimed at agricultural diversification and export promotion, the flow of women leaving rural areas for the urban services sector could be stemmed. High-value crops are frequently labor-intensive, and since there is no strict division of labor between men and women in the Philippines, diversification is likely to keep more women in the countryside and improve their incomes.

Egypt and Yemen differ from the South and Southeast Asian countries in that growth in their agricultural sectors has lagged behind the rest of the economy, and they are heavily dependent on imports of food staples. The challenge to these countries is to channel resources into agriculture while petroleum revenues and remittances are secure. To achieve greater food security, investments are needed in research and extension, particularly related to processing activities in the case of Egypt. Women are likely to be heavily involved in agroprocessing at the household and microenterprise levels. In Yemen, further irrigation may be required for major yield increases, and if large numbers of men are absent, women must be trained in system use and maintenance. Labor shortages also make mechanization a possible option, although potential environmental impacts must be considered. As in other labor-scarce systems, women carry out several important field tasks despite strong Islamic traditions; they are also responsible for livestock and poultry maintenance. Their responsibilities have also been found to increase enormously with male outmigration. An agricultural strategy must acknowledge these traditional roles if it is to succeed in increasing output.

In most of the middle-income transitional economies, natural resource degradation poses a serious threat to maintaining current levels of agricultural productivity. Deforestation, erosion and watershed degradation are severe in several countries (Sri Lanka, India, Indonesia and the Philippines), while some also suffer problems from overirrigation (Pakistan, India, Egypt) and dependency on chemical fertilizers and pesticides. The need to address women's roles in rectifying these problems is discussed in Section II.

I.C.3. Middle-Income Industrializing Economies

Having greatly reduced their reliance on agriculture, these countries are managing the transition to an economy in which agriculture is completely integrated. As the ANE strategy points out, they do not possess the infrastructural and market linkages which allow this final stage of transformation to take place, and environmental problems are also bringing agricultural sustainability into question. Therefore, institutional development and environmental protection are identified as priority areas.

In Thailand, there is a clear need for agriculture to become integrated with the rest of the economy: its contribution to GDP is a mere 17% but it absorbs 70% of the labor force*. Rice yields are low, and some investment will be necessary to increase them as land becomes increasingly scarce. Agricultural diversification has been fairly successful and should be further encouraged, but until a major shift away from capital-intensive industrialization takes place, most of the work force will not be allowed to move out of agriculture. Women play a central role in the production of rice and non-traditional crops, in agroprocessing industries, and in the use and management of land, forest and water resources. Efforts to improve or expand these activities must recognize that women's labor contributions are at least equal to those of men, and in some cases will be far greater. In areas where productivity improvement and natural resource management are priorities (e.g. the Northeast), programs that do not include women in training and extension efforts are unlikely to succeed. Neither cultural constraints nor a division of labor by gender provide a basis for targeting only men in such efforts; if anywhere, women in Thailand can receive the same services. Furthermore, as industry becomes more labor-intensive, women will continue to be absorbed in greater numbers than men. Industrial training efforts must reflect this female majority.

The experience in the Near Eastern industrializing countries sharply contrasts that in Thailand. With little comparative advantage in cereals production, and easy access to domestic and regional markets for high-value foods, agriculture has diversified significantly in Morocco, Tunisia Jordan and Oman. For these countries, further shifts into higher value processed foods should be encouraged, given that reliance on imported cereals is inescapable, and oil revenues and remittances

* See HIID (1988) for a complete discussion of the significance of the ratio (share of GDP in agriculture/share of labor force in agriculture). As stated there, "[t]he ultimate objective of any agricultural sector . . . is to produce incomes for those employed in the sector that are comparable to opportunities in other sectors or activities." Thailand's extremely low ratio indicates that labor productivity is far lower in agriculture than in industry and services, and thus opportunities in the former are also clearly less attractive.

are not always stable sources of foreign exchange. Although women are not highly visible in agriculture, they do make crucial contributions to cereals, livestock and horticultural production and processing. Efforts in improving these activities will have to reach rural women, particularly since male outmigration is so prevalent. Female labor is also likely to be important in agribusiness expansion, as their proportion of the workforce is increasing rapidly. At first their participation may be mostly in the informal sector, as is the dominant pattern in textiles and leather. The growing number of women in formal sector manufacturing, chemical and electrical industries reveals that their participation can increase slowly, despite the high social value placed on female seclusion. Indeed, agriculture is no longer the major employer of women in Morocco, Tunisia or Jordan; instead, manufacturing employs more women in Morocco and Tunisia, and professional and clerical occupations followed by services and manufacturing in Jordan. To the extent that norms regarding appropriate roles for women can be accommodated (e.g. in training programs or work environments), it will bring about greater economic benefits to women and accelerate their contribution to economic growth. Part of such an approach will involve recruitment of women professionals into research, extension and planning institutions. As the ANE strategy explains, "As economies expand and more women are drawn into the labor force (both on and off-farm), countries have an even greater need and opportunity to directly and effectively address gender and broader social equity issues."

II. THE IMPORTANCE OF GENDER IN ACHIEVING AGRICULTURAL STRATEGY OBJECTIVES

According to the ANE Food Systems Strategy for Growth in the 1990s, the major development objectives for the low-income agricultural economies are to increase basic cereals production and improve the efficiency and effectiveness of the required support services. For middle-income transitional economies, key objectives are to maintain sustained growth in cereals production and to expand the industrial sector, especially through the development of agro-processing as an additional source of rural income and employment growth. For middle-income industrializing economies, the Strategy objectives are to assist domestic institutions in the agricultural sector to be self-sustaining and linked with domestic and international research networks.

The Strategy describes seven "program emphases," or "primary investment opportunities," for attaining the agricultural development objectives of the 14 ANE countries:

- Agribusiness Development
- Natural Resources Management
- Agricultural Planning and Analysis
- Infrastructure Management
- Agricultural Technology Development and Management
- Trade and Market Development
- Institutional and Human Capital Development

The selection of priorities from among this list and the way they are conceptualized is expected to differ for countries within the agricultural, transitional, and industrializing groups and for individual countries within these groups, depending on the unique circumstances of each country. The following review examines the implications of gender analysis for the implementation of the agricultural strategy in the first five of these program emphases. Elements of the remaining two (trade and markets, and institutional and human capital development) have been incorporated into the five that are highlighted here. Three major points are stressed:

Knowledge of the varied and changing patterns of the gender division of labor within the agricultural (and nonagricultural) sectors is essential to understanding the nature of resource use and of agricultural production, processing, and marketing in each country, including the constraints to

improved productivity;

Strategic interventions are not gender-neutral in their impact; rather, they almost always affect the productivity and returns to labor of men and women differently, depending on how labor is organized by gender (as well as by class, caste, and geographic location);

Choosing investment opportunities that strengthen women's as well as men's productivity, employment, and earnings can move an agricultural strategy more quickly on the way to achieving its objectives. This point is consistent with a review of 20 A.I.D.-funded agricultural projects which concluded that objectives were much more likely to be achieved when women's participation in the project was high, that is, where substantial numbers of women received training, credit, extension, and other services as part of the investment package (Carloni, 1987).

II.A. Agribusiness Development

As discussed in Section I.C., there is tremendous scope for agribusiness development in most of the ANE countries. An agribusiness policy would presumably promote investment in both backward and forward linkages to crops and livestock production, and to fisheries and forestry. Backward linkages include manufactured inputs such as organic fertilizers, animal and poultry feed, farm tools and equipment, transport and packing materials, and other needed inputs. They also include service industries offering inputs such as on-farm delivery of seeds and fertilizers, assistance with credit applications, and so on. Forward linkages include enterprises specializing in the post-harvest processing of cereal crops, fruits and vegetables, other bush or tree crops (e.g., coffee, tea, cocoa), seeds and nuts, medicinal plants, oils, fibre crops such as cotton and jute, fish, forestry products such as lumber, fuel wood, sawdust and leaf mulch, and the processing of poultry, milk and other dairy products, meat, and animal wool and hides. Post-harvest service enterprises can also be developed for collecting and storing produce, for transport and wholesale/retail marketing. Manufacturing enterprises that consume agricultural products include producers of fruit drinks, dried fruit or cereal snacks, bread and other bakery items, canned or frozen vegetables, cheese and other dairy products, dried or frozen fish or meats, condiments and spices, medicines, natural fibre cloth and clothing or carpets, leather goods, handicrafts, building materials and furniture, and so on. Planning for these connections clearly requires collaboration between ministries of agriculture and agencies responsible for small industry development.

The purpose of developing agroprocessing enterprises is to meet growing domestic demand, promote the export of processed goods where feasible, and to add value to primary products at their point of origin. Adding value is a key ingredient of the Indonesian government's policy preventing the export of timber, for example, which places high export tariffs even on the export of processed lumber, which could instead supply manufacturers of furniture for domestic and export markets. Decentralized production and processing holds considerable promise for increasing employment and incomes in rural areas if the investment strategy favors small- and medium-scale enterprises with an appropriate labor to capital ratio. Interventions can also support micro-enterprises in the nonformal sector by providing inputs of technical assistance and credit based on minimal collateral requirements (e.g., group loans). Because women engage in processing activities in all areas--especially where they are constrained from doing fieldwork and even more so where cereal crop production carries substantial post-harvest labor requirements--the expansion and upgrading of such activities into economically viable rural industries will provide important opportunities for female employment,

whether as hired hands or workers on their own account. In areas of Bangladesh, for example, landless women have been provided with group loans to purchase semi-automated rice and oil mills so that they can maintain control over this crucial income source. Successful export promotion will also depend on women's involvement. Among the fastest growing agricultural exports*, fruits, vegetables and nuts comprise nearly half of traded value (Islam, 1988), and women typically play critical roles in their production and processing.

The ANE strategy proposes increased A.I.D. support for agroprocessing and related industries to raise employment and incomes, especially in those transitional economies where demand for higher protein foods and processed commodities is growing. Given the previous discussion of the rising female presence in manufacturing within many ANE countries, the enhancement of appropriate agribusiness enterprises represents an excellent opportunity for employing female labor and raising their productivity and household incomes.

In the low-income agricultural economies of Nepal and Bangladesh, key agroprocessing opportunities that add value to primary products include the processing of rice, millet and other grains, the manufacture of rice snacks and flours, and the processing and manufacture of foodstuffs derived from other crops (e.g., maize, fruits, oils, sugar) and finished goods derived from wool (Nepal) or jute and leather (Bangladesh). The female labor-displacing aspects of introducing automated rice hullers in Bangladesh have been discussed at length (see Section I); on the other hand, the export-oriented shrimp packing industry employs large numbers of women. Micro-enterprises engaged in activities such as drying or preserving fresh vegetables, fruit, or fish can help to alleviate problems of post-harvest wastage and low seasonal prices while meeting domestic demand. The extent to which women are incorporated as wage earners into the new processing businesses or have access to technical and financial supports for their own micro-enterprises is a critical issue if the new enterprises are to have a genuine development impact.

The middle-income transitional economies are all well-positioned to advance their agroprocessing activities to serve growing urban markets with rising incomes. As indicated in the Strategy, much of the initial growth in agribusiness will be in the informal sector, where women usually predominate. The expansion of the dairy industry in India is one example of this phenomenon

* Fast-growing agricultural exports are defined as those which have grown at a rate faster than the overall rate of growth of total world agricultural exports, that is 9.2% during 1972-85 and 7.0% during 1976-85, of which items with traded value of less than \$100 million are expected to experience the highest growth (Islam, 1988).

in which women have played a significant role as participants and income earners at the primary level (milking) because production is small-scale, decentralized, and based on women's task of caring for cattle tethered in the family compound. Women with some assets raise small animals and poultry in all of the transitional economies considered here. Appropriately organized around consistent technical assistance, credit, and standardized production methods and markets, these micro-enterprises can be upgraded in scale, quality, and returns to labor.

In the middle-income industrializing economies as well, there are sectors of agribusiness in which women play a key role as hired labor, such as the intensive commercial production, grading, and packing of fruits and vegetables for export in Morocco and Tunisia. With appropriate education, training, and business support, women could be encouraged to start their own businesses in these areas and to move into activities with higher direct returns.

Several issues arise in relation to agribusiness expansion and women's roles therein that must be addressed in every country's strategy. These include enterprise scale, labor arrangements, policy environment and entrepreneurial development, involvement of local organizations, and privatization.

ENTERPRISE SCALE

Large-scale agribusiness enterprises are frequently criticized on the grounds that they exploit cheap female labor and subject their employees to inhuman working conditions while offering few benefits and virtually no job security. Plantations and estates are often singled out for their integration of entire families into the workforce, whose aggregate wages are just barely enough for subsistence. Decentralized production, involving large numbers of small-scale growers, will usually be more efficient than plantation systems in terms of land and input use, and will certainly contribute more to rural incomes (especially where large-scale operations utilize machinery for otherwise manual operations). Centralized processing and packaging facilities, however, may frequently offer enormous economies of scale as well as greater product standardization and quality control. Therefore, large-scale agribusiness expansion should in most cases be confined to these later stages of the production process.

As in manufacturing, women in large-scale agro-processing enterprises usually represent a substantial portion of unskilled or semi-skilled labor, and in several industries (in the Southeast Asian

countries and Sri Lanka), they are in fact the majority. Rarely do these women possess any formal training, and the skills they pick up on the job are generally non-transferable. There is usually little or no prospect of upward mobility for women or men working in the lower echelons. Job security is dependent upon a stable demand for outputs, and enterprises which produce for export typically face unpredictable and volatile market conditions. Poor working conditions are the norm, including shifts that may extend to fourteen hours. An agribusiness strategy must recognize these weaknesses and design cost-effective interventions to address them.

Large-scale centralized industry and services cannot be overlooked as a source of women's employment, but they do not by themselves provide the route to sustainable development. As a group, small-scale enterprises have been found to utilize capital (typically the scarcest factor) more efficiently than large-scale enterprises (Fisseha, 1985). In other words, a country need not make trade-offs between employment creation and growth by promoting smaller enterprises. Thus, increased attention is now being directed to encouraging medium- and small-scale enterprises and family- or individually-operated micro-enterprises, which each require a somewhat different package of incentives and support measures if they are to germinate and thrive.

The nonformal sector of small-scale food processing, transport and marketing forms a significant segment of agribusiness in virtually all ANE countries. Small-scale, decentralized enterprises that provide goods and services for local or urban markets use mostly local materials and skills, with minimal reliance on foreign exchange, capital, electricity, water and other expensive inputs. In general, the smaller and less formal is the enterprise, the less restrictive are entry requirements in terms of capital or equipment and education or skills, and the easier it is for women to become entrepreneurs. Ensuring the economic viability of very small enterprises will require a systematic overall plan within each subsector to coordinate production, technical assistance and marketing, to take advantage of economies of scale (e.g. lower prices on purchased inputs), and to raise incomes by reducing competition among service providers or vendors.

LABOR ARRANGEMENTS

Further information needs to be gathered about the overall profitability of various configurations of investment by industry, type of investor (foreign or local) and labor arrangements. Over the past decade or so, reliance on full-time wage and salary workers has been declining (in favor

of casual, temporary, part-time and subcontracting arrangements, which offer much less income and security and fewer fringe benefits), and women have been disproportionately affected by this trend (Standing, 1989). There is an urgent need to find ways of linking the working situation of female workers to the returns from their labor. It may be discovered that, contrary to beliefs held by many firms, those that provide fixed wages, decent working conditions and job security are just as profitable, if not more so, than firms which are more exploitative in their practices. An A.I.D. study of critical factors affecting productivity of women workers in the agro-processing industry in Guatemala has already been designed. Among those variables to be examined are wage levels and allowances, job stability and security, actual and potential advancement, job safety and availability of worker services. This study could serve as a model for similar research in ANE countries.

POLICY ENVIRONMENT AND ENTREPRENEURIAL DEVELOPMENT

A key ingredient in successful agribusiness development is the promotion of indigenous entrepreneurship and favorable operating environments in both formal and nonformal sectors. Steps towards accomplishing these objectives include (UNCTAD, 1989):

- Reducing or removing price subsidies and altering other policies such as preferential interest rates or export promotion schemes that favor large enterprises and disadvantage smaller ones;
- Lowering import duties or other restrictions on imports that block the flow of necessary equipment or other goods to local enterprises, and eliminating export tariffs or other restrictions which discourage production for foreign markets;
- Simplifying or eliminating regulations concerning permits, location, pricing, investment, reporting, and certain labor policies;
- Emphasizing vocational, technical, and management skills training in the formal educational system, adapting adult literacy classes (where relevant) to the needs of entrepreneurs, and eliminating discrimination against girls and women;
- Strengthening small business advisory and extension services, especially in rural areas, and stimulating the flow of information between firms in market networks;
- Fostering "sites and services" programs for small enterprises and analyzing the demand for basic goods and services in the context of the availability of local materials and skills to meet such demand.

Each of these approaches requires that (i) differential effects on women and men be understood, and

(ii) obstacles that prevent benefits from reaching women entrepreneurs be identified and overcome through innovative programs and policies.

INVOLVEMENT OF LOCAL ORGANIZATIONS

Local organizations can be a tremendous resource in agribusiness promotion efforts, and particularly for incorporating women. For example, under projects conducted by A.I.D. and NGOs in Nepal, women's producer groups are becoming more involved in growing various cash crops (A.I.D., 1990). NGOs exist in almost every ANE country that have organized rural women's groups that carry out some economic and/or social functions, such as savings management and credit provision, or literacy training and nutrition education. Qualified NGOs could serve as intermediaries in reaching women who are potential suppliers of processed or high-value agricultural products, since A.I.D. agribusiness projects often aim to provide producer's groups with services such as market studies, export promotion, technology assessments and skills training. Especially with regard to credit, NGOs may be the most effective channels to reach women with this essential input. "No diversified market economy can function without working capital; an efficient rural credit system accessible to traders and small-scale entrepreneurs is probably more important than credit programs for small farmers." (HIID, 1988). In nearly all of the low-income and middle-income transitional economies, credit will play an important role in stimulating the movement out of agriculture, and where women are involved in rural trade and enterprise, reaching them will be central to the process. However, it must be kept in mind that credit will have limited impact unless accessible markets for women's goods have been identified.

PRIVATIZATION

Privatization is an area that warrants closer investigation than it has so far received. Privatization schemes rarely consider vulnerable workers who lose the relative security of public sector employment, and a large share of them tend to be women. "With few exceptions, public sector enterprises have a better record than the private sector in responding to the special needs of women workers." (Ibrahim, 1989). Evidence suggests that women may form a large portion or even the

majority of employees in public/parastatal agro-processing enterprises in several countries.* Governments could explore incentives to private owners to limit or gradually phase in reductions in wages and services, and maintain working conditions and services after they take over state enterprises. Alternatively, retraining or job placement programs for displaced workers may ease their transition to new employment.

* For a discussion of the Philippines situation, see E&Y, 1990.

II.B. Natural Resources Management

The focus of the ANE strategy is not on preserving natural resources per se, but on preventing environmentally destructive agricultural practices and restoring and ensuring the long-term productivity of agricultural lands. The ANE Environmental and Natural Resources Management Strategy identifies several areas where action can be taken to promote agricultural sustainability in ANE countries. Included are:

- Policy Review and Reform
- Restoration of Degraded Uplands
- Greater Use of Integrated Pest and Soil Fertility Management

To ensure the success of such interventions, gender-related dimensions of underlying production and management systems must be understood and taken into account.

II.B.1. Policy Review and Reform

An analysis of gender roles in agriculture and natural resources management can inform both policy and practice. A review of agricultural policies at the national level, might identify negative environmental impacts from policies such as subsidizing chemical fertilizers or pesticides; promoting large-scale monocropping without sufficient fallow or crop rotation for domestic markets or export; subsidizing mechanical equipment such as tractors which accelerate erosion; or perpetuating inequitable land tenure systems in which cultivators have no incentive to invest in conservation efforts or in which large portions of the rural population remain landless and are forced to exploit natural resources for their survival. Each of these policies has a gender component:

- In most farming systems in Asia and the Near East, women (and children) collect and spread organic fertilizers and manage pests by hand, whereas men are more likely to spread or spray chemicals with mechanical equipment. If chemical fertilizer or pesticide subsidies were removed, how might this policy affect the gender division of labor? Would women be drawn back into their traditional task, or might fertilizer use simply decline, along with soil productivity? What is the best approach to ensuring an adequate labor supply for meeting both productivity and sustainability requirements?
- Where cultural norms permit, women in cultivator households often contribute substantial amounts of field labor to diversified cropping systems, while men (and hired workers, male or female) are more likely to work in single cash crops. How would the encouragement of inter-planting or crop rotation affect the use of male and female labor, family and hired? Might it produce labor shortages in some settings? How could these be overcome?

- Women tend to engage in hand operations such as weeding, hoeing, or hand harvesting, but only men--with few exceptions--drive tractors or handle other mechanized operations. Altering the terms of trade that currently favor imported machinery in many countries could help to preserve more sustainable and less environmentally damaging agricultural practices, but maintaining agricultural productivity then depends on the availability of rural labor, much of which is female. Can additional labor requirements be met easily? What steps will assure that they can without placing enormous labor burdens on men and women cultivators?
- Most ANE countries can be characterized by heavy population pressure on arable lands and a preponderance of privately owned and operated holdings of moderate size (under 10 ha irrigated or 25 ha unirrigated), with much smaller average size holdings.* Women are not only disproportionately concentrated among landless and near-landless households in most countries (due in part to male outmigration and in part to women's more limited access to resources of all kinds), but even within landowning or tenant households, women rarely have independent rights of land use or ownership.

With the majority of rural households in most countries headed by landless workers, tenants, or marginal cultivators, the remainder consists of small and medium-size cultivators and larger commercial holders or plantations. Communal holdings among tropical long-fallow cultivators are still found in some areas of South and Southeast Asia, as well as pastoral systems in North Africa and the Middle East. Each of these land use systems poses different environmental threats as landholders and the landless--both women and men--try to balance their immediate interests in survival, security and profit with their long-term interests in preserving natural resource endowments. Correcting major class and gender inequalities in the distribution of land ownership and the rights to its products--although politically difficult in most countries--could provide a larger share of the rural population with land security and thus with greater incentive to invest in long-term improvements. What policies are then needed to ensure that both women and men can acquire joint or individual title to land?

These questions about the possible impact of policy reform are speculative, of course. A review of actual policies and practices within a given country focuses these arguments more clearly.

II.B.2. Restoration of Degraded Uplands

Reforestation and agroforestry are central elements of upland land rehabilitation. Innovative efforts to replant depleted forests and to introduce new sources of wood for fuel, fodder, building materials and other uses have been conducted in a number of ANE countries, increasingly with the active participation of local populations. If women are to have an incentive to participate in schemes that require additional labor inputs (planting and tending new trees, for example), they must have a clear sense of how the results will benefit them, at least in the long run, and the degree of control

* In Egypt, Indonesia, and Sri Lanka, for example, about 90% of all significant holdings (over one hectare) are less than 5 hectares; about 80% in Bangladesh, India, Pakistan and the Philippines; about 70% in Nepal, Thailand, and Morocco; about 50% in Tunisia and Jordan.

they will exercise in decision-making and over products (Molnar, 1988). Benefits include income-earning potential or more convenient sources of fuel and fodder. Among the more promising areas of intervention are programs that:

- involve women in choosing locations and species that best meet their needs, within the household and for small-scale manufacturing;
- provide the means (including secure land rights) and incentives for rural women's groups to plant, maintain and supervise community woodlots of fast-growing trees for controlled harvesting;
- promote intercropping of woodlots in the early years with vegetables, forage plants or other crops to diversity land use and generate immediate income;
- provide women with tree seedlings (especially for fruits and nuts) to plant in or near their compounds or on communally leased land with long-term security of tenure;
- encourage women to raise fast-growing fodder crops on unused wasteland, for their own use or for sale, while encouraging stall feeding of animals (where appropriate) to protect soils from overgrazing;
- experiment with alternative energy sources such as solar ovens and crop by-products with improved, energy-efficient simple technologies for cooking. Active involvement of local women in the design and implementation of such projects is essential to their success.

The fuelwood crisis is extremely severe in some upland settings. As community resources are exhausted, women spend longer hours each day searching for wood, which in some cases directly reduces agricultural productivity. A 1983 study of several hill communities in western Nepal found that women in badly deforested areas spent on average one more hour each day collecting fuel and fodder than women in less deforested areas. Because women's workloads were already extremely heavy, the additional time was taken away from field labor (Kumar, 1988). In other settings, fuelwood shortages result in a loss of women's income. For example, silk making in Northeast Thailand has declined as prime fuelwood that allows controlled temperatures becomes unavailable (Clarke, 1987). Scarcity and rising costs of fuel can also detrimentally alter farming and cooking practices. For example, in some areas, animal dung which was previously used as fertilizer is diverted to substitute for fuelwood, thus reducing soil productivity. In other areas, women prepare fewer cooked meals or select fast-cooking food of lower nutritional value to save fuel.

Many programs are underway to identify new sources of household energy to substitute for

fuelwood and to create establish social forestry programs or community woodlots that provide local, sustainable sources for fuel, building and crafts supplies, fertilizers and animal feed. Social forestry schemes are prominent in nearly all the Asian countries; some have included specific components to train women as paid or volunteer forest or woodlot managers and staff. However, most social forestry projects fail to meet the needs of poor women. For example:

An evaluation of cookstoves and social forestry programmes in Gujarat, India, showed that the wood produced under these programmes is being taken by dealers to the cities, where it is used for construction or sold to townspeople as fuel. Nothing is left to relieve the scarcity of wood in the villages. Yet the Gujarat programme is considered to be a pioneer case of social forestry because of its high production levels (Dankelman & Davison, 1988).

In addition to fuelwood supplies, manufacturing is another area where women's needs can be addressed through forestry programs. Forest-based industry is an important source of rural income and employment for both men and women. Typically, 15-40% of all small-scale enterprises (rural and urban) utilize forest products as primary raw materials (e.g. carpentry, cane and bamboo works, basket and mat making). Women comprise 31% and 21%, of labor in such operations in Egypt and Bangladesh, respectively; in Egypt they also make up 65% of owners, in Thailand, 14% (Fisseha, 1985). Depletion of forest resources is a rapidly growing constraint to production in many areas. Efforts should focus on improving and sustaining women's small-scale forest industries rather than simply planting new stands that do not yield marketable products.

Agroforestry, as distinct from forestry or communal woodlots, combines trees or woody bushes with herbaceous crops and animals in the same land management system. It encompasses a variety of land use systems ranging from intensive farming to extensive grazing, such as bush fallow farming, managing fodder trees in private or communal grazing lands, planting trees and shrubs as fences on farm boundaries, intercropping tree cash crops with other crops, and other mixtures of trees, annual crops, and animals (Rocheleau, 1988a). Tied more specifically to agricultural practices than the previous examples, well-planned agroforestry schemes can conserve soils, and they may also provide a range of products for multiple household and market uses such as fuel, food, oils, fodder, fibers and building materials. In many settings, women from landless families earn a major component of their livelihoods from agroforestry systems; as such, they constitute an important resource for planning and controlled harvesting. A successful program in Indonesia's Upper Solo Valley has allowed women to earn up to 60% of their incomes from tree products grown in their own home gardens.

Home gardens, animal corrals and communal lots are especially promising targets for women's

agroforestry programs:

- Limited plot size of home gardens encourage multistoried systems, women's control over their area and their relative permanence make investment in tree crops and site improvement less risky, they can easily provide residues for feeding smaller animals or supplemental fodder for larger ones, and they are cost-effective sites for application of manure from livestock maintained nearby.
- Among semi-nomadic pastoralists, women maintain milk animals in small corrals near the home, which are ideal sites for fodder-based agroforestry systems.
- Public commons (such as Panchayat forests in India, Nepal and Pakistan) often have the advantages of being close to markets, water sources and other central points, containing riverbanks and special soil types or vegetation that are not available on the farm, allowing labor sharing arrangements, and minimum size for certain ecosystems (Rocheleau, 1988b).

Again, agroforestry schemes are not always desirable in and of themselves. For example, new alley-cropping systems which slow erosion may also displace shrubs or weeds that provide vegetables of high nutritional value. In other cases where women's legal rights are limited, their control over programs may be threatened once they achieve some success, as illustrated by a Ford Foundation pilot project in Andhra Pradesh, India. After women had converted previously abandoned wasteland into a productive fodder plantation, local men began making claims to the land (Molnar, 1988).

The case studies of ANE countries in Section I demonstrate that in many areas women are taking on increasing responsibility for agricultural production and for the maintenance of terraces, canals, and other irrigation facilities. In some areas these are the traditional responsibilities of women; in others, women's work has intensified with male outmigration. In the state of Uttar Pradesh in northern India, for example, where the Himalayan ecosystem is threatened by overgrazing, bad land use, and the depletion of forest cover, women in the hill areas participate in all farm operations except plowing, while most able-bodied men migrate to the plains in search of work. A major program in effective watershed management has to reach women with the appropriate resources and support if it is to result in significant improvements in land use practices (Hooper, 1988). In other types of ecosystems, providing local incentives and supplies for women as well as men to plant and maintain trees on the boundaries of fields, on slopes and in unused spaces to reduce soil erosion and wind damage to crops can carry important benefits. For projects involving landless workers or seasonally unemployed cultivators, hiring women on an equal basis with men (or in special women's teams) to rebuild irrigation channels, plant stabilizing grass on sand dunes, raise and transplant tree seedlings, or reconstruct and restock inland fishponds serves the dual purpose of providing employment for women from low-income rural households and promoting conservation efforts.

II.B.3. Integrated Pest Management (IPM) and Integrated Soil Fertility Management (IFM)

IPM and IFM offer alternatives to overreliance on chemical pesticides and fertilizers. The main features of these management systems are (A.I.D., 1990):

- IPM:**
- (i) Maintaining pest populations at tolerable levels, rather than complete eradication.
 - (ii) Combinations of interventions that make maximum use of natural controls, such as biological predators, resistant crop varieties, and cultivation practices that reduce infestation risks.
 - (iii) Use of chemical pesticides only when absolutely necessary and in such a manner that minimizes impact on natural predators, the surrounding ecosystem, and human health.
- IFM:**
- (i) Combining use of organic and inorganic fertilizers with composting to reduce nitrate runoff.
 - (ii) Improving fertilizer application and timing to increase efficiency and to reduce off-site runoff.
 - (iii) Rotating crops and intercropping to regenerate soil organic matter, quality, and fertility.
 - (iv) Using nitrogen-fixing cover crops or green manure to improve soil structure and moisture, especially on drylands with erodible soils and low organic matter.
 - (v) Using vegetation to reduce soil losses from wind and water erosion.

Wherever women are responsible for removal of pests by non-chemical methods, or preparation and application of organic fertilizers, IPM and IFM will have to involve their labor and should tap their traditional knowledge in these areas. In Egypt, for example, women and children are hired to pick pests off cotton by hand. Therefore, women are more likely to recognize early signs of pest infestation or plant disease than are men. Early diagnosis and treatment thus depends in many cases on women's knowledge and skills. IFM programs which include changes in cultivation patterns obviously cannot exclude women, especially where interventions directly alter the nature of production tasks carried out by them, even if these tasks are sometimes shared with men. Two examples illustrate this point:

- In the Northeast Rainfed Agricultural Development project in Thailand, the incorrect assumption that men were the "principal farmers" and thus the appropriate recipients of training resulted in the failure to plant an important nitrogen-fixing crop which was intended to fertilize the rice. Many of the men selected for training were frequently away from their farms for outside work; the wives had not been trained (Carloni, 1987).
- The use of legumes (green manure) for soil enrichment in the Hyderabad region of Southern India was abandoned because growers preferred pulse crops and disliked the additional work required. Whether women's work was involved was not noted in this observation, but it is

likely that much of the additional work was done by women (IRRI, 1985).

II.C. Agricultural Planning and Analysis

Planning and analysis are essential components of an agricultural strategy which is responsive to changing internal and external conditions. The ANE Strategy identifies strengthened analytic capacity as the main objective of A.I.D. involvement in the area. Three focus areas are emphasized: strengthening data collection, research and planning capabilities associated with cereal production; strengthening links between agencies which focus on micro- and macro-level analysis and planning, and strengthening the position of analysis units vis à vis production units within Ministries of agriculture. Several sub-components of these focus areas are directly related to gender issues and are discussed briefly here.

II.C.1. Identify Production and Marketing Systems with a Dynamic Comparative Advantage

The growing body of new "gender-conscious" research on women's work in various farming systems reveals how resistant previous "gender-blind" research has been to acknowledging the importance of women's labor and decision-making roles to agricultural production and household consumption. In identifying production and marketing systems that have a comparative advantage, it is essential that planners:

- include in their assessment the full range of crops, livestock and productive activities in which women specialize in each setting, many of which may have a comparative advantage that is not immediately visible to researchers nor generally acknowledged;
- ensure that "favored" systems identified as having a comparative advantage can incorporate women fully as participants and earners;
- ensure that increasing the amount of land and other resources allocated to such favored systems -- for example, to export crops or even to cereals for domestic markets -- does not threaten the production of other essential food crops that may compete for time and space, or add disproportionately to women's labors without increasing their returns;
- determine whether added requirements of female labor can easily be met (by family or hired workers), or if potential bottlenecks exist that will need to be solved by addressing women's time constraints, rather than bypassing women altogether (e.g. through mechanization which employs only men).

II.C.2. Track and analyze the changing characteristics of the rural labor force

As noted in Section I of this paper, the gender composition of the rural labor force has remained quite stable in some countries while in others it has changed significantly over the past ten or twenty years. Outmigration from rural areas is not always disproportionately male. In Thailand and the Philippines, for example, more women than men seek work in the towns and cities, and migration patterns are shifting in other countries as rural women are increasingly driven to urban labor markets by their poverty (e.g., in Bangladesh, as destitute women seek domestic service in towns) or by the lure of higher paying clerical or manufacturing jobs (e.g. in Egypt).

National level figures conceal important variations within countries which affect the supply of agricultural labor in major ways. Moreover, patterns of gender differentiation interact with patterns of class, caste, or ethnic differentiation to produce complex and sometimes countervailing outcomes. In some areas of India, for example, the withdrawal of female labor from fieldwork among newly prosperous landholding households resulting from successful adoption of HYVs has coincided with the marginalization of landless and poor tenant households whose women have been increasingly pushed by their poverty (or by male outmigration) into rural labor markets (Sen, 1982). As the family labor force becomes increasingly male, the hired labor force becomes increasingly female. The composition of the rural labor force thus needs to be tracked not only by gender but also by landowning status, work status (permanent as compared with occasional hired workers, for example, and unpaid family helpers as compared with employers or own-account workers), age, educational and skill level, caste or ethnicity, and other characteristics that form the basis of labor force segmentation. Moreover, distinctions need to be made between changing size and composition resulting from supply factors (e.g., birth rates, children's school attendance, entry into or withdrawal of women from the labor force for economic or social reasons, rural-urban migration or shifts of workers into rural industry or services), and demand factors (e.g., the size distribution of landholdings, labor requirements of different cropping and livestock systems, mechanization, wage rates, and other factors). Similar tracking of employment in the agribusiness sector should also take place. The first step is already being taken under the A.I.D. Agribusiness Sector Assistance Program in the Philippines, where women's and men's employment in new and expanding enterprises will be monitored.

In most ANE countries, seasonality also affects the size and composition of the farm labor

force in dramatic ways, with the female (and child) share of the total rising during the busy season and falling during the slack season. Seasonal labor shortages may be mitigated by pulling in migrant workers (e.g., in Egypt, many of whom are women and children), local hired workers, or family members who normally do not engage in agricultural work. Seasonal labor shortages or surpluses affect various groups differently. Declining wage rates and rising unemployment in the slack seasons almost invariably displace more women than men from the wage labor force, for example, as among casual agricultural laborers in rural West Bengal. The implications of this selective displacement are that rural women, especially those who are landless, may be far more in need of seasonal employment in agro-based rural industries than are rural men; in many countries such women form a core group of unemployed and underemployed workers who are nevertheless in desperate need of a regular income.

II.C.3. Assess Impacts of Policy Interventions on Specific Segments of the Rural Population

Analysis is needed to determine the impacts of macro-policies upon production, farm income and employment, disaggregated by gender as well as by class and other relevant criteria. Examples of questions which would need to be addressed are:

- What have been (or will be) the differential impacts on men and women among different landholding groups of reduction or removal of subsidies on agricultural inputs such as fertilizers, machinery, or credit?
- Are women--and in particular, female heads of rural households--more or less disadvantaged than men as a result of higher input prices? How could these impacts best be assessed?
- To what extent do measures such as these which are intended to "rationalize" production create costs and benefits that are unequally distributed across specific farm groups, and between women and men?
- Which groups are selectively harmed in each area, and which groups benefit?
- How do stabilization or adjustment policies, such as devaluation and removal of export restrictions, that favor production of tradables (i.e. goods that are exported or imported) over non-tradables affect women's small-scale enterprises?
- What are the gender-related constraints to expanded agricultural production or diversification, even where price signals are rationalized?

The analysis of differential effects of Structural Adjust Programs (SAPs) offers one example.

SAPs have a direct impact on food supplies, food distribution and effective demand, affecting women both as consumers and producers. SAPs aim at improving the balance of payments by (among other means) stimulating agricultural production for export or for import substitution. Incentives directed toward export production could draw additional female labor into fiber crops (cotton, jute) or non-essential food crops (coffee, tea, sugar, coconut), thus improving their employment opportunities, but these gains might be incurred at the cost of labor lost to basic food crops upon which subsistence depends. SAPs also aim to reduce national domestic expenditures by (among other means) removing food subsidies which can form a significant share of total government outlays (e.g., almost 6% in Bangladesh in 1980). The removal of price controls may augment the flow of returns to producers, many of whom are female, thus raising the incomes of a significant segment of the rural population. On the other hand, constraints that prevent production expansion, such as lack of access to technology or credit, or limited labor availability, may affect women more severely than men. Thus, poor women (and men) could be left behind by such policies, while having to pay higher food prices.

II.C.4. Strengthen the analytical capacity of planning agencies

The ANE strategy proposes to monitor the analytical output of planning units in industry, finance, central banks, etc. with regard to their impact on farm level production, income, and employment; to strengthen the links between agencies which focus on micro- and macro-level analysis and planning (e.g., between agricultural production and the exchange rate or trade and tax policies); and to strengthen the relative position of analysis units vis à vis production units within Ministries of agriculture. In each of these capacities, A.I.D. can support staff training (short-term and long-term) in incorporating gender (as well as income and landholding group) into data collection, analysis and planning, and assist in establishing data collection and management systems. Most importantly, A.I.D. Missions can themselves demonstrate the crucial ways in which gender analysis assists in achieving policy objectives and in minimizing negative outcomes of policy decisions.

II.C.5. Achieving food security

The Strategy addresses food security--that is, reduced reliance on food aid or imports--as a planning objective only for low-income countries. Cereal production in particular is to be emphasized. In this context, program emphasis needs to be placed on understanding how farm level

decisions are made, how uncertain flows of inputs affect costs and production decisions, and how output markets are structured. Understanding women's role in farm management decisions and how women's labor use is affected by uncertain or costly inputs is crucial to identifying constraints on expanded cereal production in these countries.

A second component of food security is also relevant here, however. Whereas the first component is ensuring an adequate national food supply by raising domestic production, the second is providing an adequate food supply to households that face chronic food shortages by raising their incomes and employment opportunities, that is, their effective demand for food (Reutlinger and Pellekaan, 1986). Thailand provides a striking example of a situation where national food security is unquestionable, but large numbers of households still precariously rest on the edge of subsistence. Because women are almost always overrepresented among impoverished groups, and because it has been established that women devote a greater portion of their income to household nutritional needs than men, a food security policy should target women, and especially women heads of households, with employment opportunities and (where necessary) emergency food assistance in order to achieve its objectives.

A.I.D. can also play a role in promoting greater food security in those middle-income countries where oil revenues and remittances have allowed for large food imports that may not be possible to sustain on a long-term basis. Domestic grain production may not efficiently meet demand in these countries, however, they do need to further diversify their export bases, including agricultural exports. Depending on the types of products most suitable for export (e.g., fruits and vegetables in Jordan, Morocco and Tunisia), women's labor will be required to differing degrees for export production and processing.

II.D. Infrastructure Management

The ANE agricultural strategy identifies improvements in transportation and public irrigation systems as primary investment opportunities for supporting cereal production, transport, agroprocessing, and marketing. The planning and management aspects of such systems rather than their construction and financing are to be given priority, with some attention to innovative and experimental programs. This emphasis provides an ideal context in which to identify constraints to production and distribution--or the causes of pre- or post-harvest losses--that are based on women's lack of access to the key resources and services they need: water, secure storage, transportation, and markets.

Given the division of labor in agriculture, women in most settings may be less likely than men to depend on infrastructure facilities for producing or marketing cereal crops such as rice, wheat, sorghum or millet which are destined for intermediate or distant markets, and more likely to use (or need) such infrastructures for raising and marketing fruits and vegetables, herbs and spices, eggs and other dairy products, and poultry and small animals destined for local markets. Women's access to infrastructure is also a central issue in promoting small-scale agribusiness. Where women's physical mobility is severely restricted, as in parts of South Asia and the Near East, a key requirement is to enable women producers to gain direct access to inputs, transport and markets. Where access is restricted, women must rely on intermediaries who may charge extremely high fees for services, resulting in low returns to women and disincentives to production.

II.D.1. Irrigation Systems

In most of the ANE countries, irrigation expansion will continue to take place, though it may be limited relative to earlier programs. The interface between gender roles and the functioning of irrigation systems is complex. In general, irrigation increases the demand for labor--whether hired or household--by expanding the amount of arable land, thereby permitting double or even triple cropping, adoption of certain high-yielding cereal varieties, and planting of more labor-intensive crops such as rice and vegetables. Unless it is accompanied by substantial mechanization, irrigation is likely to intensify the demand for female labor disproportionately in weeding, harvesting, processing and

storage*. In addition, women's (and children's) labor is often needed for the timely maintenance of irrigation channels or terrace walls as well as to carrying water for use elsewhere. Irrigation for primary crops is usually within men's domain of responsibility within ANE countries, but women also have a strong stake in ensuring that water is readily available for household use, animals and home gardens. Properly located, irrigation can reduce the claims on women's time if it cuts down on trips to distant water sources. Given their roles as household water suppliers and users, garden cultivators and livestock and poultry managers, women's involvement in irrigation system design, construction and maintenance is essential to maximize benefits. If women are expected to grow agroprocessing inputs or export crops once irrigation is made available, then their input is absolutely critical. The Aslong Irrigation Project in the Philippines is an example where women's roles as household fiscal managers compelled many of them to participate in the scheme, although they were initially disregarded altogether (Illo, 1988).

Planners are increasingly looking to community groups to manage and maintain new systems in part as a means of managing water supplies (e.g., groups of landless workers who manage the distribution of tubewell water in some areas of Bangladesh, in part as a means of protecting water supplies from expropriation by larger landowners). Given women's vested interest in water distribution, it makes good sense to select women as representatives of landed or landless households in water management schemes and in the planning and design of new irrigation facilities. Constraints to women's participation in irrigation management, (e.g. time limitations, socio-cultural restrictions, biases held by local organizers or extension agents), need to be identified and overcome. In some areas, the outmigration of males from rural areas, especially from smallholdings, increases the importance of involving women in irrigation programs to ensure they meet their objectives. In India, for example, A.I.D. has sponsored a sub-project for women in the Maharashtra Minor Irrigation Project to train farm women (including landless women working for wages) in four villages to schedule irrigation, recognize symptoms of water deficiency, maintain drainage systems and field channels, pay irrigation charges, and use other innovations associated with irrigated farming (Davies, 1988). Elsewhere, women have been trained in the maintenance of tubewells and other systems and appointed as paid or voluntary managers. The key issue is to ensure that these responsibilities are not simply added to women's current workload without significant adjustment or benefit.

* Some HYVs require less labor in processing per unit of output than traditional varieties. The added demand for labor created by irrigation may partly compensate for the displacement of female (and male) workers as mechanization inevitably proceeds, but it does not rationalize subsidized interest rates or other policies that encourage mechanization beyond efficient levels.

II.D.2. Rural roads and markets

The ANE strategy emphasizes the need for road maintenance and expansion to smooth the flow of inputs to farmers and of products to market. A key question is the extent to which women producers have access to these same roads. Are women free to move about and to take their products to market? What transportation can they use? Do women carry their products in headloads while men appropriate the ox-carts or lorries and buses? Just as women in most settings have restricted use rights to land and livestock, they frequently have restricted use rights to public roads, public and private transportation, and markets. Innovative experiments could be conducted in a number of ANE countries to facilitate women's direct access to markets for their goods. These include:

- supporting enterprises in which women collectively purchase and operate the means of transportation (e.g., animal-drawn carts or motorized vans) to carry their own goods to market;
- designing new local, urban or district markets or renovating existing ones to take into account women's needs for secure storage, a safe place to stay overnight (if necessary), child care, and other services such as credit, pricing and product advice, and banking facilities;
- supporting trade associations and marketing groups to represent traders' interests to governments;
- training and employing female market managers and technical and credit personnel.

Rural transportation and marketing systems are important determinants of returns to agricultural labor and of the efficiency of distribution. Removing impediments to women's access to and effective use of such systems forms a logical point of intervention.

In the low-income and lower middle-income ANE countries, the construction and maintenance of irrigation systems and rural roads is not only a priority area of investment but also a major source of employment for landless workers. A significant portion of the international food aid directed to Bangladesh is used to pay workers in Food-for-Work schemes, for example, many of whom are destitute women doing road construction or post-monsoon rehabilitation of roads and canals in order to support themselves and their children. Although such programs offer vital opportunities for earning income, the conditions of women's work in some schemes have been criticized because of low wages and the lack of child-care facilities, basic work equipment, sanitary facilities, living quarters, and protection from sexual harassment. Women's productivity naturally suffers. The role of women as hired laborers in public works projects such as these needs to be carefully monitored to ensure their productivity and safety.

II.E. Agricultural Technology Development and Management

In its review of the scope for increasing the productivity of cereals and other commodities in the ANE region, the agricultural strategy paper includes a statement that has particular relevance to the division of labor based on gender:

Regardless of the specific commodities in question, it is clear that development of new technologies will have to be sensitive to the changing composition of the rural labor force. Similarly, the adaptation and transfer of technologies will need to give increasing consideration to the audience, its characteristics and capabilities. Examination of farm management decision-making and rural labor allocation and constraints, with an emphasis on gender issues, should precede the design of specific productivity-enhancing technologies.

This observation gives rise to a number of questions about the impact of new technologies on women, and vice versa. For example:

- What are the potential consequences of adopting new cereal varieties for women and men engaged in agriculture, and how do these effects vary in different sociocultural, economic, and natural environments? What are the gender-disaggregated labor requirements associated with new technologies adopted in the region?
- What types of improved technologies, geared to the production of high-value exports, will generate employment and income for both women and men? How can technologies that assist in traditionally female tasks, such as weeding or post-harvest processing, be developed such that women's productive contribution is maintained through continued control over the technology and returns to labor?
- What effects do male and female educational levels have on the adoption and/or successful use of new inputs, equipment and techniques?

These are only a few of the many questions that arise in connection with the implications for women's productivity of the development and management of new agricultural technologies. The questions are perhaps most relevant to A.I.D.'s continued support of the International Agricultural Research Centers (IARCs) and the National Agricultural Research Systems (NARSs) in each country.

II.E.1. Support for International Agricultural Research Centers

Specializing in tasks such as the collection and maintenance of germplasms, basic genetic improvement, and information exchange, the IARCs have a long history of experience with specific

crops and cropping conditions (e.g., maize and wheat, potatoes, rice, livestock, tropical agriculture, semi-arid tropics, and dryland areas). Two centers are located in the ANE countries: the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), in India, and the International Rice Research Institute (IRRI) in the Philippines. Both have done significant work on gender issues. While ICRISAT has conducted research which incorporates gender in the analysis of labor use patterns, IRRI has made a substantial contribution by publishing the research papers of its 1983 conference on Women in Rice Farming (IRRI, 1985). The papers explore a number of dimensions of women's work in rice farming in Asian and African agriculture, including case studies of different countries and of technological innovations and the impact of HYVs. IRRI also has an ongoing project to further research the roles of women in rice farming systems.

Support for this kind of activity can clarify the connections between gender and class divisions in different locations, on the one hand, and agricultural productivity for home consumption and for sale, on the other. A review of the IARCs which assessed their gender-related impacts includes many examples of areas in which awareness of women's special knowledge or activities is critical to program success. These include the key role of home gardens in germplasm collection; the relation between seed characteristics and domestic post-harvest technologies; women's use of crop byproducts for home repairs, animal feed, crafts, fuel; the importance of non-cereal crops to women's self-provisioning and local and long-distance trading; the need for gender-disaggregated data in farming systems research and experimental field trials; and the role of female decision-making in family farm management (Jiggins, 1986). The review also emphasizes the importance of linkages between research and extension services within countries, a topic most appropriate to A.I.D.'s support for NARSs in ANE countries.

II.E.2. Support for National Agricultural Research Systems

A.I.D.'s support for the NARSs stresses the need for accelerated human resource development in all countries, for more site-specific adaptive research and extension, and for research on more effective extension methods tailored to specific sites and audiences. These needs are reinforced by the consideration of sustainability as well as productivity. In general, stronger linkages are needed in all countries among producers (including small farmers and tenants, and landless laborers and their organizations) and formal agencies with respect to research and extension services for production, processing, and the end use of agricultural products. Each of these emphases could

help to overcome obstacles that depress women's productivity and earnings.

The traditional model of delivering extension services has been challenged for its gender-based as well as class-based biases. Despite women's traditional involvement in many aspects of farm production and the large-scale outmigration of male workers to urban and industrial areas in many ANE countries, extension service systems have continued to be directed to male farmers, thus holding back women's productivity. In general, male extension workers prefer to visit larger landholding households and to talk with men. Few countries employ female extension workers, and those women who are employed are often delegated to home economics instruction, not agriculture, and face other on-the-job difficulties such as lack of housing or transportation. As a consequence, women from landless or landholding households who are actively involved in various aspects of crop or livestock production, fish raising, processing, marketing, and other activities rarely receive the direct technical assistance and credit support they need.

Some ANE countries have successfully recruited female extension personnel. In Yemen, for example, the use of female extension workers has proved vital to reaching farm women who are increasingly responsible for food production as men migrate to the oil-producing countries, and a few women are being trained in India, Sri Lanka, and Bangladesh, among other countries (Duncan and Habib, 1988). A study of extension practices in three states of India, concluding that the training and visit approach in those areas had minimal impact on women involved in agricultural production, recommended a strengthened role for the women's component, including the training of female agricultural personnel and of male personnel to work with women (Hooper, 1988). The most successful examples are the Philippines, where about half of all extension workers are women, and Thailand, where one-quarter are women. Despite their numbers, however, employing women in extension positions does not necessarily result in the effective transmission of resources to female farmers unless special attempts are made to support female staff in their field operations and to allocate sufficient resources such as technical assistance, seeds, fertilizers, marketing advice, and credit to female clients for their own use.

The recommendation for more on-site adaptive research and extension (rather than laboratory or field-station testing) directly addresses women's needs. If research-extension linkages are mediated through services which have little contact with female farmers, researchers will receive limited or distorted information from the field and form a biased picture of agricultural realities (Jiggins, 1986). On-site experiments that take into account women's varied specializations in particular crops, animals,

tasks, or technologies--and of constraints on their productivity--can elicit important information about previously invisible aspects of the production and distribution process. The following are questions that should be raised in this process:

- Has basic agricultural research focused mainly on selected cash crops, for example, or has it also paid attention to the crops and other agricultural activities with which women are most involved? (Spens, 1986)
- In developing recommendations for extension purposes, is full use made of women's knowledge, about soils, crops, and processes with which they are familiar?
- Are women involved in the interpretation as well as the implementation of on-farm trials and experiments?
- How can the supply system for key inputs be designed to deliver necessary inputs (credit, training, equipment) to women most effectively?

The accelerated development of human resources connected with national agricultural research systems also directly involves women. A.I.D. has increasingly recognized the importance of sponsoring women for training: in Pakistan, A.I.D. is financing the construction of the Agricultural University in Peshawar which, in recognition of the cultural conservatism in the district, will have facilities reserved especially for women; in Indonesia, A.I.D. is funding scholarships for 60 women for MA degrees, primarily in the field of agriculture (Davies, 1988). Additional interventions could result from an analysis in each country of the trends in female enrollment in agricultural training courses and the employment of their graduates. Are there significant differences in educational enrollments, attainments, and quality, by gender, in the different countries?

Investments are clearly needed at lower levels as well, for example, in agricultural training at the primary and secondary school levels in those countries with a high proportion of the labor force employed in agriculture. Even the basic issue of literacy and numeracy skills is relevant to improving agricultural productivity and returns to labor (e.g., through more efficient marketing) in those countries with relatively low primary school enrollment rates, particularly for girls. It is also relevant to creating more favorable conditions for off-farm employment of the growing numbers of women and men for whom agriculture cannot provide a livelihood.

III. CONCLUSIONS AND RECOMMENDATIONS

A.I.D.'s food systems strategy for growth for Asia and the Near East offers an excellent opportunity for incorporating women as active decision-makers, participants and beneficiaries of sustainable agricultural growth and broad-based development. By most accounts, women constitute between 20% and 50% of the agricultural labor force in ANE countries, with the exception of Bangladesh and Oman, as well as from 15% to 45% of workers in manufacturing and service occupations. Women represent a tremendous resource for agricultural development in the region, one that is typically underutilized or altogether neglected. In many areas, however, women's agricultural productivity and incomes are depressed in both absolute terms and relative to men's because women are denied access to the vital resources and opportunities they need.

Agricultural and environmental interventions should offer a unique opportunity to promote women's participation by consciously addressing gender-specific constraints to their employment, productivity and income. These constraints include limited access to education at every level (again, in both absolute and relative terms), to training programs in agriculture marketing, management and research, to property ownership or independent land use rights, to capital and technology, to transportation and markets, to assistance with child care and other domestic burdens, and in some cases, even to the use of public space in their immediate environs. Constraints such as these not only place girls and women at a severe social and economic disadvantage, but they also impede agricultural and industrial development and contribute to environmental degradation. Yet with commitment and gender-conscious planning, many of these constraints could be overcome.

This review of the implications for A.I.D.'s strategic planning of the role of women in the agricultural economies of Asia and the Near East reaches three general conclusions:

- **knowledge of the varied and changing patterns of the gender-based division of labor within the agricultural and non-agricultural sectors of each country is essential to understanding the nature of resource use and of agricultural production, processing, and marketing, including constraints to increased productivity;**
- **policies that appear to be "gender-neutral" on their surface rarely turn out to be gender-neutral in their implementation or outcomes; rather, they almost always affect the employment opportunities, productivity, and labor inputs and returns of men and women differently, depending on how labor is organized by gender (and by class, caste, geographic location and other criteria);**

- **investing specifically in improving girls' and women's education and employment opportunities, productivity, and earnings is not only more likely to achieve food systems objectives, it can also produce more substantial effects than similar investments in boys and men. Research in a variety of settings suggests that women's earnings contribute more to the well-being of children than the same level of men's earnings, for example, because women generally spend a greater portion of their income on children's health, nutrition and education (Dwyer and Bruce, 1988).**

In addition to these general conclusions, the analysis also produces more specific conclusions.

GENDER DIFFERENCES IN AGRICULTURE IN ASIA AND THE NEAR EAST

1. **The classification of countries based on the degree of structural transformation provides a useful guide for identifying priority areas for investment. The range of economic, agricultural, and natural endowment characteristics is substantial across the 14 countries, however, and none has adhered strictly to the "normal" development sequence outlined in the strategy.**

2. **Analysis of trends and differentials in female labor force participation in the ANE region reveals that there is no linear evolution by which the structural transformation of low-income or transitional economies induces male migration out of agricultural production into the nonagricultural sector, resulting in higher female participation in the remaining farm workforce.**

(i) **The proportion of the total labor force engaged in agriculture around 1980 ranges from over 90% in Nepal to only 10% in Jordan. Although these proportions are declining in all 14 ANE countries, the absolute numbers of persons who depend on agriculture for their livelihoods continue to grow in all countries except Jordan. In most countries, the numbers of women and men employed (or seeking employment) in industrial and service occupations - - whether in the formal or non-formal sectors -- are growing even faster.**

(ii) **Discrepancies between different statistical sources in estimates of the size and gender composition of the agricultural and nonagricultural labor force at the national level make it difficult to draw firm conclusions about trends and variations for all countries in the region. Dramatic changes from one census or survey to the next often cast doubt on the validity of outcomes. It is also difficult to establish in some countries what proportion of women are working for wages, and contrasting patterns of female labor force participation can be**

identified within each group of countries.

- (iii) Within the low-income agricultural group, girls and women constitute a high proportion of all agricultural workers in Nepal but a very low proportion in Bangladesh, where cultural values tightly constrain women's work outside the household. The female share of agricultural jobs may be declining in both countries. Neither country yet offers significant opportunities for female employment outside agriculture, although prospects are improving slowly.
- (iv) In the seven countries of the middle-income transitional group, girls and women constitute a low to moderate proportion of all agricultural workers--generally well under one-third--while their opportunities in the non-agricultural sectors range from highly limited (Pakistan) to abundant (the Philippines). Women's share of farm jobs (both paid and unpaid) appears to be dropping in some countries (e.g. India, Pakistan) and rising in others (Yemen, possibly Egypt), while their share of jobs in industry and services is, on the whole, going up.
- (v) The five countries of the middle-income industrializing group reveal female shares of the farm labor force ranging from very low (Oman, and perhaps Jordan) to very high (Thailand), with declining female shares in farming in Jordan and rising shares in Morocco and Tunisia. In industry and services the female share is growing in all five countries, originating from initially low levels in Jordan and Oman and from already high levels in Thailand.
- (vi) Patterns of outmigration from rural areas do not conform to the model of intensified male migration with rising agricultural productivity. Instead, heavily male-dominant migration to cities prevails throughout the South Asian region (Nepal, Bangladesh, India Pakistan, Sri Lanka), that is, in those countries with the highest shares of GDP in agriculture and relatively low productivity. Female migrants outnumber males in the Philippines and Thailand. The remaining countries show only slight differences in the ratios of adult males to females in rural and urban areas, suggesting that men do not substantially outnumber women in rural-urban migration streams. A strong negative association between estimates of the female share of the farm workforce and the value of production per agriculture worker across the 14 countries implies that men are more likely to leave the least productive agricultural areas for work in town or abroad.
- (vii) National patterns conceal important variations within countries in migration patterns and

female shares of agricultural and nonagricultural jobs. Statistics reported at the national level do not necessarily reflect conditions in any particular region or among any particular group; rather, distinct patterns of migration and labor force participation can be identified in most countries on the basis of regional differences and differences in structures of opportunities based on class, caste, farm size, tenurial status, and other characteristics.

- (viii) Aggregated statistics also reveal nothing about how agricultural work is organized by gender. The division of labor or agricultural tasks throughout much of the region is quite rigid, with women often specializing in seed selection, weeding, transporting, preparing and applying organic fertilizers, post-harvest processing, and raising processing, and raising small animals and poultry, while men specialize in land preparation, planting and harvesting, care of large animals, and activities involving modern techniques or inputs. In some areas, however, men and women do the same work almost interchangeably. There are many variations in the ways agricultural work is organized around age, gender, and the use of family or hired workers.

3. Rather than representing a linear model, variations in female labor force participation in the agricultural and non agricultural sectors appear to be a function of interactions among (1) the degree of cultural restriction on female mobility; (2) the type of primary crops grown or animals raised; (3) the use of irrigation and mechanization; and (4) the nature of demand for male and female labor outside agriculture in both rural and urban areas, which may compete with agricultural work and induce seasonal or permanent migration flows.

- (i) Cultural constraints on female mobility are generally stronger in Muslim countries (except Indonesia) and in more orthodox Hindu areas of northern India and weaker in southern India, Sri Lanka, and throughout southeast Asia. Norms of female seclusion are manifested differently depending on class and caste identities. They are less likely to restrict girls and women in the poorest households (who must work out of economic necessity) or those with high levels of education (who may work in clerical fields or the professions). In most areas, cultural constraints on girls and women's mobility appear to be eroding due to economic pressure and increasing female education, among other factors.

- (ii) In general, cropping systems based on rice production, fruits or vegetables, and small animals or poultry draw on female labor more intensively than systems based on wheat production or free-ranging cattle. The cultivation of HYVs demands more female labor for weeding and

irrigation. Plantation systems using labor-intensive methods, such as the tea and rubber estates of Sri Lanka and Indonesia, employ large numbers of women. The effects of cropping systems on female labor depend in part on the existence of cultural constraints noted earlier. For example, women in Bangladesh (formerly East Bengal) rarely transplant or harvest rice whereas women in West Bengal (India) commonly work in the fields as family or hired labor.

- (iii) Irrigation and mechanization, although frequently found together, generally have opposite effects on female labor use in agriculture. Other things being equal, irrigation increases the demand for labor by permitting double-cropping and the use of high-yielding cereal varieties. In the absence of mechanization, female labor (household or hired) is generally preferred for labor-intensive hand operations. Mechanical equipment for tasks such as plowing, planting, fertilizing or spraying pesticides, harvesting, threshing, hulling, and oil extraction are generally appropriated by men, however, which may displace female hand labor or substitute for animal power, depending on the nature of the task and the cropping system.
- (iv) Female employment in the non-agricultural sector tends to be concentrated in particular subsectors that differ considerably across and within countries. On the whole, expanding agroprocessing industries and garment, textiles, and leather production for export have elicited high female participation, even in cultures that have traditionally discouraged female employment outside the home. Much of this employment is in the non-formal sector, frequently performed in the context of a "putting out" system with relatively low levels of skill and income and no opportunity for advancement. Where cultural values permit, young rural women with little schooling also migrate to cities in search of domestic or factory work, while older women engage in petty commerce such as street vending. In countries with higher educational levels, such as Egypt, Jordan and especially the Philippines, women have also captured a growing share of clerical and professional jobs in the formal sector.

One of the clearest points that emerges from the analysis of gender differences in agriculture in Asia and the Near East is the diversity of patterns both within and across countries. As a consequence,

- investment decisions, while influenced by the overall classification of countries as low-income agricultural economies, middle-income transitional economies, and middle-income industrializing economies must ultimately be tailored to the unique economic, social and environmental characteristics of each country;

- the need for country-specific solutions is particularly important in choosing investment priorities that will benefit women, or that will benefit from women's participation, because patterns of female labor force participation and of the gender-based division of labor in agricultural and nonagricultural occupations differ widely within the region;
- valid statistics are urgently needed at the national level to document precise trends and variations in the size and composition of the labor force by sector and employment status. A.I.D. can support efforts led by United Nations agencies to obtain better statistics while treating currently available measures for some countries with considerable caution.
- planners will also need better statistics on employment patterns and the gender based division of labor and incomes for particular geographical areas, population subgroups, or economic subsectors as a basis for making agricultural investment decisions with full knowledge of the nature of women's participation. A specific allocation of funds should be identified for this purpose;
- constraints to women's full participation need to be identified and analyzed within each setting in order to devise specific means for overcoming them. Both immediate and long-term time frames are relevant, especially with regard to investments in basic education and advanced training needed to equip girls and women for higher skilled employment in agro-processing industries and in agricultural management and marketing.

THE IMPORTANCE OF GENDER IN ACHIEVING STRATEGY OBJECTIVES

The ANE food systems strategy identifies seven "program emphases" or "primary investment opportunities" for attaining its development objectives. Where the emphasis should be placed in any given country depends on its process of structural transformation along with other characteristics such as its natural resource endowments, educational level of the workforce, and the degree of infrastructural development. Each of the seven program emphases carries important implications for women's roles and contributions. Depending on which strategic priorities are emphasized, certain aspects of women's roles in agriculture and overall development must be understood in order to maximize women's contributions to growth and facilitate the transformation process while minimizing the adverse impacts of economic adjustment.

Although specific recommendations should be tailored to the unique conditions of each country, a number of general points can be summarized here.

1. **The development of agribusiness enterprises through the creation of forward and backward**

linkages to the production process holds great promise for employing women workers and raising their productivity and incomes if it is carefully planned to achieve these objectives. A number of points concerning women's participation in agribusiness are worth stressing:

(i) Women and men are affected differently by and face different constraints in responding to policies such as reduction or removal of price subsidies, preferential interest rates, import duties and export tariffs.

(ii) Decentralized production holds considerable promise for increasing employment and incomes in rural areas if the investment strategy favors small- and medium-scale enterprises with an appropriate labor to capital ratio.

(iii) Because women engage in processing activities in all areas, the expansion and upgrading of such activities into economically viable rural industries will provide important opportunities for female employment.

(iv) Small-scale, decentralized production often utilizes land and other scarce inputs most efficiently, but centralized large-scale processing and packaging facilities may sometimes offer economies of scale as well as greater product standardization and quality control. Women typically represent a major portion of unskilled and semi-skilled labor in these enterprises, and generally possess no formal training, have virtually no prospects of promotion, and work under poor conditions and with tenuous job security.

(v) As reliance on full-time wage and salary workers declines in favor of casual, temporary, part-time and subcontracting arrangements, which offer less income and security and fewer fringe benefits, women have been disproportionately affected.

(vi) Women form a large share of labor in many public/parastatal agro-processing enterprises, and as such they are disproportionately affected by privatization schemes.

(vii) The nonformal sector of small-scale food processing, transport and marketing forms a significant segment of agribusiness in virtually all ANE countries. In general, the smaller and less formal is the enterprise, the fewer are the barriers to entry in terms of capital or equipment and education or skills, and the easier it is for women to become entrepreneurs.

(viii) Local organizations have been shown to be effective channels for reaching women entrepreneurs with technical and financial services.

In policy dialogue and program/project design, impacts on women and their potential participation must be determined early on. Missions could initiate such assessment by:

- analyzing closely the impacts of subsidy removal, lowered import duties and other agribusiness export promotion policies on women's income sources, and through policy dialogue, promoting those interventions that enhance women's opportunities, or at least do not diminish them;
- assessing women's anticipated participation and constraints to participation in export-oriented agro-processing enterprises as labor, input suppliers and entrepreneurs, and integrating such assessment into AMIS rapid appraisals and commodity feasibility studies, and other A.I.D.-commissioned analyses;
- promoting the development of sub-sectors in which evidence suggests that women's participation and benefits are foreseen to be substantial;
- including assessments of potential or actual impacts on women in Scopes of Work for all design and evaluation teams, particularly where a project or program may undermine traditional sources of women's income without providing alternatives.

Where large-scale processing facilities are promoted, A.I.D. Missions can pursue a number of interventions which address the disadvantages female employees generally face:

- training women for jobs at medium- and high-skill levels from which they might otherwise be excluded (e.g. quality control, product design, marketing) which also improves their future employment prospects;
- including women in long-term as well as short-term technical and management training programs. Despite the difficulties this may pose in many countries, innovative approaches can rectify women's virtual absence in long-term training programs--examples exist of donors successfully incorporating women by requiring that female candidates be presented before any trainees are allowed to begin the program;
- encouraging the adoption and enforcement of legislation which guarantees suitable working conditions and permits workers to organize;
- establishing child care facilities, dormitories and/or transportation services which allow larger numbers of women to work in enterprises away from their homes. In regions where economic necessity does not immediately lead women and their families to put aside cultural restrictions, female recruiters can serve as a mechanism for outreach and determining specific steps that will make women's employment feasible. Such a system has been successfully demonstrated under an A.I.D. project in Jordan;

- researching the links between workers' productivity and their wage levels and allowances, job stability and security, actual and potential advancement, job safety and availability of worker services.
- initiating programs to ease the effects on employees displaced by privatization of state-run agro-processing enterprises. Steps could include incentives to private owners to limit or gradually phase in reductions in wages and services, and maintain working conditions and services after they take over state enterprises; alternatively, retraining or job placement programs for displaced workers may ease their transition to new employment.

In promoting and upgrading **small-scale agribusiness enterprises**, specific constraints faced by female entrepreneurs must be recognized and overcome. Possible interventions include:

- providing technical assistance, credit and marketing services designed specifically for female clients, taking into account time constraints, literacy levels, and restrictions to mobility, and other factors faced by women entrepreneurs;
- seeking qualified NGOs to serve as intermediaries for service and credit provision. Such groups have often displayed the necessary creativity to overcome constraints to women's economic participation. For example, an NGO in Bangladesh has experimented with setting up women's markets, which allow female vendors to sell their goods directly to female buyers who no longer need to rely on husbands or sons to make purchases. Such an approach bypasses cultural taboos while giving women greater economic independence.

2. The success of natural resource management programs related to agriculture depends heavily on women's participation because of women's specific crop-tending responsibilities, their special roles in collecting fuel, water and animal fodder, and their reliance on forest products as a source of income. More specifically:

(i) In several of the ANE countries, women traditionally contribute a large portion of labor in field operations (e.g. in planting, transplanting, weeding and harvesting), and women also tend to be found to contribute more to diversified food cropping systems than cash monocrops. In nearly all the countries, women and girls are responsible for collection of fuelwood, fodder and water for domestic use.

(ii) With increasing male outmigration in some regions, particularly from marginal and degraded agricultural areas, women's farm responsibilities are increasing and they are often the sole land managers. In some countries, women have also become involved in irrigation management and other traditionally male tasks.

(iii) Women tend to engage in hand operations such as weeding, hoeing, or hand harvesting, but only men--with few exceptions--drive tractors or handle other mechanized operations, which are often environmentally destructive.

(iv) Highly skewed land distribution patterns, in which large segments of the population do not have security of ownership or tenancy, discourage investment in soil conservation and other long-term preservation of the natural resource base. Women are disproportionately represented among landless and near-landless households in most countries, and even within landowning or tenant households, women rarely have independent rights of land use or ownership.

(v) In various settings, fuelwood shortages have been found to reduce agricultural productivity if manure is used as fuel rather than fertilizer, harm nutritional intake if women cook fewer meals or switch to lower-value foods that require less cooking, or eliminate sources of income that require long periods of cooking or baking.

(vi) Where deforestation has increased the time women spend in collecting fuel and fodder, agricultural productivity may suffer if it depends directly on labor inputs and there is little substitution between male and female labor.

(vii) Women frequently earn a large part of their incomes from forest products, either directly through extraction and sale, or indirectly through small-scale manufacturing.

(viii) If women are to have an incentive to participate in forestry schemes that require additional labor inputs, they must have a clear sense of how the results will benefit them, at least in the long run, and the degree of control they will exercise in decision-making and products.

(ix) In most ANE countries, women are traditionally responsible for organic fertilizer application and removal of pests by non-chemical methods, while men are usually in charge of spreading or spraying chemical fertilizers and pesticides.

Following the ANE Environmental and Natural Resources Management Strategy, a few important areas for A.I.D. intervention include **Policy Review and Reform, Restoration of Degraded Uplands, and Integrated Pest and Soil Fertility Management**. The following list illustrates steps to improve the effectiveness of interventions through consideration of gender issues, and to address

women's needs and ensure they receive benefits:

- determining impacts of policies aimed to promote natural resource conservation, such as removal of subsidies on chemical fertilizer or farm machinery, on the demand for women's labor, since women traditionally apply organic fertilizer and perform hand operations;
- determining how women's labor will be used if more diversified cropping systems are to be promoted;
- promoting policies which provide greater security to tenants and sharecroppers, and which specifically ensure that women can acquire individual or joint title to land;
- improving and sustaining women's small-scale forest industries rather than simply planting new stands that do not yield marketable products;
- providing the means (including secure land rights) and incentives for rural women's groups to plant, maintain and supervise community woodlots for fast-growing trees for controlled harvesting;
- experimenting with women's agroforestry programs planting in home gardens, animal corrals and communal lots;
- sponsoring reforestation or grassland projects in which women are hired--or assume collective responsibility in exchange for use rights--to tend tree nurseries and transplant seedlings, select seeds, oversee harvesting or grazing rights, etc.;
- encouraging women to raise fast-growing fodder crops on unused wasteland, for their own use or for sale, while encouraging stall feeding of animals (where appropriate) to avoid overgrazing.
- ensuring that benefits of reforestation and agroforestry programs reach women directly and cannot be usurped by men;
- hiring women in reconstruction, planting, restocking of fishponds and other conservation works;
- involving women in the design and training components of integrated pest and soil fertility management programs, so as to tap their traditional knowledge and ensure that an additional labor burden is not placed on them.

Programs and policies relating to natural resource management will need to be tailored to the interests and skills of landless women as well as women in cultivator households. Both use environmental resources and have a vested interest in protecting long-term resource sustainability as long as their immediate needs for fuels and other materials can be satisfied.

3. Agricultural planning and analysis activities in ANE countries should clearly include gender

components that aim to understand the links between policy interventions and the productivity, security, and well-being of women in landless and cultivator households. A.I.D. Missions can support steps in this direction by:

- ensuring that identification of commodity production and marketing systems with comparative advantage includes analysis of the full range of crops, livestock, and other productive and marketing activities in which women specialize;
- encouraging investments in "advantaged" production and marketing systems that do not disrupt other systems which are essential to household consumption or to women's incomes;
- strengthening the analysis of the changing characteristics of the rural labor force as a guide to planning, centering on the changing gender composition according to geographical location, landholding status, age, and specific division of labor;
- ensuring that assessment of policy interventions on specific farm groups distinguishes between women and men within each sector, and includes considerations of employment opportunities, hours worked, productivity, incomes, control over earnings, and other conditions such as health and nutrition, reproductive behavior, schooling, and migration patterns;
- assisting agencies with development of data collection and management systems which provide clear information about women's and men's employment in agriculture and agro-processing;
- supporting training courses in gender analysis for staff of planning and analysis units, both short-term in-country (possibly in conjunction with training of Mission personnel) and broader, more intensive long-term programs for one or two staff members;
- conducting policy dialogues that emphasize both national and household-level food security, the latter requiring programs that specifically target poor women.

4. Investments in rural infrastructures such as roads, markets, and irrigation systems that take women's specialized needs into account can significantly improve women's access to such infrastructures, and thus, their productivity and incomes. The ANE agricultural strategy identifies improvements in transportation and public irrigation systems as primary investment opportunities for supporting cereal production, transport, agro-processing, and marketing. Women's access to these services is indeed critical:

- (i) Particularly where women's physical mobility is severely restricted, a key requirement for women producers is to gain direct access to inputs, transportation and markets.
- (ii) Although women may be less dependent on infrastructure for producing or marketing cereal

or cash crops destined for distant or intermediate markets, they are likely to rely on facilities for raising and marketing produce or small animals destined for local markets.

- (iii) Women's access to infrastructure is central to the promotion of small-scale agribusiness.
- (iv) As household water managers, women have a vested interest in its distribution, but there may be numerous barriers to their participation in irrigation design and management.
- (v) Irrigation tends to increase demands for female labor in production and processing.
- (vi) In some areas, male outmigration further increases the importance of involving women in irrigation programs to ensure that objectives are met.
- (vii) Women commonly do not have equal access to rural roads and public and private transportation necessary for marketing products.

It is thus essential that planning and management take explicit account of the ways in which women's access to vital infrastructures is currently constrained and how these obstacles can be overcome. For example:

- including women of landless and cultivator households in the planning of irrigation systems and in training programs for their construction and maintenance;
- training women as well as men in techniques of irrigated agriculture and in the associated cropping and fertilizer requirements;
- hiring women to manage irrigation systems, allocate use rights and collect fees, arrange for maintenance by groups of landless women;
- recognizing women's special needs for transport for themselves and their goods that may require women-owned and managed transportation systems;
- supporting women's trade associations and marketing groups, and train women as market managers and technical assistance and credit personnel.

5. The design of new production-enhancing technologies must take into account the needs and capacities of women workers and the decision-making roles of women in farm management. A.I.D.'s support for International Agricultural Research Centers in the ANE region and for National

Agricultural Research Systems can emphasize the following:

- **analysis of the potential consequences of adopting new cereal varieties and other new cropping systems and technologies to the use of female and male labor among different population segments in different physical environments, and the absolute and relative distribution of returns to labor;**
- **research on improved crop and livestock technologies that are adapted specifically to women's needs, capabilities, and decision-making responsibilities;**
- **observations and on-site experiments that enable researchers to learn about women's experience with home gardens, seed selection, the use of crop byproducts, strategies of crop and income diversification, and other areas of expertise;**
- **national agricultural extension services that actively recruit women researchers, extension agents, and other specialists on an equal basis with men.**

As is the case for the program emphases outlined in the ANE strategy itself, each of these recommendations needs to be adapted to the particular circumstances of each country. Priorities will differ depending on structural and social conditions, government policies, the nature of domestic and regional markets, environmental and agricultural potential, and other factors. The major point to be stressed is that all aspects of A.I.D. program and project identification, planning, implementation, and assessment in the region should actively be directed toward specific investments in women's productivity and earnings. In this way, the Agency can improve women's contributions to and benefits from food systems growth. Working in a gender-neutral framework is simply not sufficient to accomplish the full range of program objectives. Planning for agricultural growth in the 1990s offers a major challenge to A.I.D. to engage in innovative and path-breaking support for women in agricultural economies and for growth that taps women's full productive potential.

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