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Investing in Female Education for Development

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INVESTING IN FEMALE EDUCATION FOR DEVELOPMENT*

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EXECUTIVE SUMMARY

There is a persistent gap between female and male access to educational opportunities in most of the Asia and Near East regions, though the gap has varied enormously between countries. Differences in school enrollment rates have lessened over the past two decades throughout the regions, and may have been eliminated in Sri Lanka and in some East Asian countries. Nevertheless, these differences remain considerable in many countries.

Enrollment rates refer only to levels of investment in formal schooling. Evidence of gender gaps in other forms of educational investment (e.g. informal, vocational) is very sketchy, but seems to suggest similar patterns. And although the gaps between investments in female and male education probably have been declining in the Asia and Near East regions in recent decades, gender gaps in the stock of educated adults are likely to remain for decades in most countries in the regions.

Modeling the determinants of and the impact of female education leads to some important insights. A basic point of these considerations is that one has to be careful about misinterpreting associations between female schooling and various outcomes in areas such as wage rates and child health necessarily to imply causality. It is important to consider the fact that educated females cannot be selected randomly. These women and girls are likely to come from family or social backgrounds which are more supportive of female education and may have greater intellectual ability or motivation. Therefore, if one wishes to identify the effect of increases in female schooling on various outcomes, all of these other characteristics -- which are difficult to isolate -- must be controlled.

As a result, interpretations of many existing empirical studies of female education in the Asia and Near East regions and elsewhere in the developing world are ambiguous. But there are recent studies which do attempt to control for such empirical problems. These studies suggest that demand factors are important to understanding gender gaps in education. Demand factors include expected rates of return in labor markets and the opportunity costs of gender specialized tasks, such as child

care.

It should be noted, however, that the gender gap in wage rates does not necessarily imply a gender gap in rates of return to educational investments. If the wage gap narrows with more schooling, for example, the rates of return on investments in schooling may be higher for females than for males. This pattern is found in recent post-primary schooling estimates for Southeast Asia.

Also, in addition to demand factors, supply is important in some contexts. One study in Pakistan, for example, reports that establishing the same number of primary schools for girls as for boys would eliminate at least half of the current gender gap in cognitive achievement, if not eliminate it altogether.

Although recent systematic studies suggest that the impact of female schooling on paid labor force participation and other outcomes is substantially less than often claimed, the effects of female schooling appear to be far-reaching and highly significant. These recent studies also examine certain effects that are not usually included in most studies of female education. An example would be the household production effects of substituting female schooling for male schooling, keeping in mind important gender and generational relationships.

This paper considers policy implications of female education. One major motivation for policy implications is the possibility of reducing market distortions, thereby allocating resources more efficiently to increase the benefits of education. Market distortions arise from differences in private and social costs or benefits of education. For example, if a larger population of well-educated women causes slower spread of contagious diseases, then private incentives to invest in female education are likely to be inadequate from society's point of view, since they do not capture the benefits to others of a reduction in contagious diseases.

Although it is often claimed that major efficiency reasons exist for investing in female education because of such externalities, there is very little evidence on the existence or importance

of such externalities and their relationship to female education. Efficiency justifications for policy interventions that favor female education seem to be based primarily on speculation. Nevertheless, there does not appear to be an efficiency justification for present gender gaps in education either, and therefore, shifting resources from male to female education would probably increase efficiency.

A second argument for policy interventions in education is equity, which is a strong basis for the elimination of gender gaps in education.

This survey elaborates on more detailed policies related to the supply of and demand for female education and on research needs.

1. INTRODUCTION

This paper is a summary of a longer survey of the current state of knowledge regarding female education and development, with particular emphasis on countries in the Asia and Near East regions. The main objective of this paper is to provide background for Women in Development (WID) and educational strategies in the 1990's in these regions. The survey examines what we know and do not know about female education and discusses implications for immediate policy formulation and the research that will provide a strong foundation for future policy formulation.

1.1 Importance of Education in Pursuit of Goals Related to Productivity, Equity, and Socioeconomic Outcomes

The developing countries have major economic goals related to economic growth and to equity.¹ The pursuit of these goals relates to (1) increasing the efficient use of productive assets, (2) changing the distribution of assets among members of society, or (3) ensuring that all members of society have some basic level of access to and control over resources and assets (though private or public entitlements to transfers can serve this purpose also). Typically, major assets are characterized to include physical capital (such as machinery and equipment), natural resources, and human resources. Analysts' and policymakers' perceptions of the relative importance of these assets to the pursuit of growth and distributional goals have varied from time to time. At times, one of the

¹ Growth and equity usually refer to income or to command over resources. Sometimes other terminology is used for these goals. A prominent example is Sen's (1985) focus on "functionings" and "capabilities," which have become fashionable in some circles as preferred means of characterizing a broader interest in human welfare in which the role of income as a means rather than an end is emphasized. but as Ravallion (1990) emphasizes in a recent interview of Dreze and Sen (1989), in the operationalization of the Sen approach, despite the distinctive terminology, income or the command over resources from a combination of one's income and one's access to social services, remains central.

three has been emphasized to the exclusion of the others. But from a longer-term perspective, all three appear to be important, with the question of emphasis at any point in time being in part the question of which of the three is in relative short supply.

Human resources usually refer to education, health, nutrition and through their impact on the size of the population, fertility and mortality. Though there are important dimensions of each of these and of the interactions among them, probably most emphasized among them has been education. In recent years, education has been emphasized considerably. There are assertions that the rates of return to investments in education, particularly basic education, are quite high in comparison to other investments. (See Colclough 1982, Eisemon 1988, Haddad, Carnoy, Rinaldi, and Regal 1990, King 1990, King and Hill 1991, Psacharopoulos 1985, 1988, World Bank 1980, 1981, 1990.) This perspective has been reinforced by the so-called "new neoclassical growth theory" of Romer (1986), Lucas (1988), Azariadis and Drazen (1990) and others which places externalities in the stock of knowledge at the center of analytical growth models. These models are consistent with phenomena such as diverging growth rates among countries and with increasing growth over time. For such reasons investments in education are advocated as a major means of pursuing growth and equity goals.²

Education can take many forms, including formal schooling, vocational training programs, informal household education, and on-the-job training. Of these, formal schooling has been emphasized most for various reasons. Formal schooling is most amenable to policy so it is of particular interest to governments and to international institutions. Formal schooling is perceived as the cornerstone of all education because, at least in its basic forms, it lays the foundation for subsequent formal and informal education and training programs. Furthermore, information about

² I present surveys of the empirical evidence and of the analytical models in Behrman (1990a,b). Also see Section 7.1.2 in Behrman (1991).

formal schooling is more accessible than information about other forms of education because government involvement in it is considerable and because it is a relatively separate activity (in contrast to informal education).³

Whatever the relative importance of these reasons, there is more knowledge about the role of formal schooling than about other forms of education in development. This may highlight a need for further analysis of other forms of education.⁴ It certainly limits the range of topics that can be covered in this survey to those related to formal schooling.

1.2 Particular Roles of Female Education

Investments in female education are of particular interest and importance to development for three primary reasons.

First, available estimates suggest that the rates of return on investments in female education (in terms of economic productivity) are at least as high as the rates on investments in male education (Schultz 1989, 1991).

Secondly, it is widely conjectured that there are important positive effects of women's education on non-market factors related to human resource development (i.e. health, nutrition, and children's education) and population growth (i.e. reductions in fertility and infant and child mortality). (See World Bank 1981, Colclough 1982, Eisemon 1988, Haddad, Carnoy, Rinaldi and Regal 1990,

³ It is important to note that educational analyses are generally conducted by academics who may value formal schooling more than society as a whole. It is also likely that they understand and communicate about formal schooling better than they communicate about other educational investments.

⁴ Though just because we know less about other forms of education does not necessarily mean that the returns to research resources are likely to be higher to investigating such forms of education rather than formal schooling. In making such a decision, one also has to take into account such factors as the greater difficulties in obtaining useful information to undertake such research.

King 1990, King and Hill 1991). There is a widespread perception that better educated women are more able to process information and to use goods and services effectively. Women are then better prepared to provide health care, to educate their children and to reduce their fertility to desired levels.

Within the framework of the widely-used quantity-quality model of fertility (e.g. Becker and Lewis 1973, Willis 1973), better educated women have incentives to have fewer children, but children with a greater number of economic and social advantages. Women with fewer children have a comparative advantage in being able to provide those children with a higher standard of living. And if there are negative externalities to population growth as is often claimed⁵, then social benefits will accrue in addition to the private benefits of focusing on quality instead of quantity.

It is important to note that the possibilities outlined above depend in substantial part on gender specialization in the provision of health, nutrition and child care. If the effects of female education are described in terms other than narrow economic productivity, then total returns to investments in female education are likely to exceed investments in male education.

Finally, there is the issue of equity. In most societies women appear to have less control over resources and over their destinies than do men. Increasing female access to education is one widely advocated means of removing or reducing these inequities. Access to education would increase women's productivity, strengthen their bargaining positions and increase the number of options in their lives. Another distributional consideration is that female access to education is likely to shift

⁵ There are claims, for example, that greater population increases pollution and other negative environmental negative externalities. There are also claims that there are negative externalities to more children because of the excess of social over private costs for education and health services. If there are negative externalities to having children for these or other reasons, then there will be social benefits in terms of reduced negative externalities if more-educated women have fewer children. It should be noted, however, that there are likely to be other means to obtain such ends that are more direct and more effective. These include measures to reduce the differences between private and social costs of various activities ranging from attending school to using common grazing or forest lands. See the discussion in Section 7.1 in Behrman (1991) regarding policy choices.

a larger share of resources to children (Schultz 1991).⁶

For all of these reasons, female education is of special interest to development strategy in general and to educational policy in particular.

1.3 Outline of this Summary Paper

Section 1 of this paper provides an introduction and background information. Section 2 describes recent experience with female education and examines the extent of the gender gap in education in the countries of Asia and the Near East. Section 3 summarizes the analytical frameworks for measuring the determinants and impacts of female schooling and the analytical framework for evaluating policy options. It also summarizes available systematic empirical studies and overall policy implications.

⁶ However, it is not clear that this is a move towards equity since there has been a secular trend towards increasing per capita income in most of the Asia and Near East regions and in the developing world in general, so future generations probably can be expected to be better off than present generations.

2. CHARACTERIZATION OF FEMALE EDUCATION AND RELATED GENDER GAPS IN THE ASIA AND NEAR EAST COUNTRIES

The gender gap in education and other human resources is large in many countries of Asia and the Near East, but with considerable variation across countries.⁷ Using cross-country data, it is possible to characterize the magnitude of and changes in educational gender gaps.⁸ Data from the World Bank (1990) are presented in Table 1, "Salient Characteristics of Education in the Asia/Near East Region."⁹

Table 1 presents a row of information for each country included. The countries are grouped geographically (i.e. South Asia, East Asia, Egypt/Europe and Middle East/North Africa). At the bottom of the table, information on "country group means" is presented. Country groups are defined in World Bank (1990) as low-income, middle-income and high-income.

Most of the Asia and Near East countries in Table 1 are in the low-income group (all those in South Asia, Indonesia, Myanmar, and Yemen PDR) or the middle-income group (all others except Singapore). Some of these data are also presented in graphs of the appendix. The graphs plot four variables related to female education against per capita GNP in United States dollars for 1987. The four variables plotted are 1) the ratio of female enrollments in primary school relative to the size of

⁷ In Behrman (1991), I also review gender gaps in other dimensions of human resources in the Asia and Near East regions and related variables that pertain to the context for gender gaps in these countries.

⁸ For other recent characterizations of the gender gap in school enrollment rates with particular emphasis on the Asia and Near East regions, see Cudra, Anderson, Moreland, and Dall (1988), El-Sanabary (1989), and Khan (1989). For more broad recent perspectives on the gender gap in developing countries, see Cudra, Anderson, Moreland, and Dall (1988), Haddad, Carnoy, Rinaldi, and Regal (1990), King (1990), King and Hill (1991), Schultz (1990), and Sen (1990).

⁹ In Behrman (1991) I also present estimates of the extent to which individual countries in Asia and the Near East fall below or are above the average values for all developing countries controlling for per capita income (with the control based on cross-country regressions). I refer in what follows to such results as ones that control for real per capita income. For some of the key variables, the graphs in the appendix present these regressions (or the average experience for all developing countries controlling for per capita income) and indicate whether the data for specific Asia and Near East countries are above or below the average experience of all developing countries once there is a control for per capita income.

Table 1. Salient Characteristics of Education in the Asia/Near East Region

	Percentage of age group enrolled in education																Females per 100 males				Adult illiteracy (percent)			
	Primary				Secondary				Tertiary (total)		Primary net enrollment (percent)		Primary pupil-teacher ratio		Persistence to grade 4 as a percentage of cohort									
	Total		Female		Total		Female		(total)		1975	1987	Female		Male		Primary		Secondary		Female	Total		
	1965	1987	1965	1987	1965	1987	1965	1987	1965	1987	1975	1987	1970	1984	1970	1984	1970	1987	1970	1987	1985	1985		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	
South Asia:																								
Bhutan																								
	49	59	31	49	13	18	3	11	1	5	..	53	45	48	..	..	..	30	47	66	..	45	78	67
	20	82	4	..	5	26	2	..	1	5	..	..	..	..	..	..	..	..	18	..	16	..	88	74
	74	98	57	81	27	39	13	27	5	..	..	..	42	..	42	..	45	..	60	..	39	..	71	57
Maldives																								
	40	52	20	35	12	19	5	11	2	5	..	..	41	41	56	..	60	..	36	49	25	39	81	70
Sri Lanka																								
	93	104	86	102	35	66	35	69	2	4	..	..	..	..	94	97	73	99	89	93	101	106	17	13
East Asia:																								
China																								
	72	118	65	115	12	46	7	..	1	..	72	..	..	..	67	78	89	99	84	..	59	79	35	26
	71	..	65	..	15	..	11	..	1	..	..	..	..	..	39	..	58	..	89	..	65	..	..	..
	113	106	111	106	41	68	40	69	19	38	95	..	31	..	..	..	..	..	..	..	..	..	..	..
Guinea																								
	44	70	35	64	4	12	2	9	..	2	..	..	19	31	76	..	84	..	57	79	37	57	65	55
	78	95	74	..	14	28	11	..	2	20	..	..	35	..	71	..	69	..	88	..	69	..	12	9
	90	102	84	102	28	59	22	59	2	7	..	..	..	22	..	100	..	99	88	95	69	98	34	27
	105	..	100	..	45	..	41	..	10	..	100	..	29	..	99	..	99	..	88	..	103	..	21	14
Europe:																								
East																								
	75	90	60	79	26	69	15	58	7	20	..	..	39	..	85	..	93	..	61	75	48	68	70	56
Near East/North African:																								
Jordan																								
	23	..	10	..	11	..	5	..	..	..	..	..	..	..	60	..	56	..	25	..	25	..	75	59
Arab Rep.																								
	9	91	1	40	0	26	..	6	..	2	22	..	56	..	44	71	31	76	10	29	3	12	97	86
	57	71	35	56	11	37	5	36	1	10	47	57	39	26	..	77	..	79	51	63	40	66	78	67
	91	116	65	107	16	40	9	34	2	6	..	95	56	31	..	90	..	94	64	81	38	75	59	46
	95	..	83	..	38	..	23	..	2	..	..	..	38	..	90	99	92	..	78	96	53	95	37	25
	106	..	93	..	26	..	20	..	14	..	..	..	..	..	..	..	..	..	83	..	67	..	..	..
Lebanon																								
	68	96	53	81	7	55	5	46	1	9	77	88	43	29	90	..	95	..	60	79	40	73	63	50
	..	97	..	92	..	38	..	29	..	2	32	80	..	..	82	96	82	99	16	85	..	65	..	..
Country Group Means																								
Low-Income																								
	73	104	..	95	20	37	..	29	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Middle-Income																								
	92	104	86	101	26	54	22	54	6	17	..	..	36	29	77	84	76	89	85	88	89	101	31	26
High-Income																								
	104	102	105	103	62	93	59	96	21	39	..	..	25	..	95	97	94	96	95	95	94	100	..	..

Source: World Bank, 1990, World Development Report, 1990 Oxford: Oxford University Press for the World Bank.

the female primary school age group (in percentages), 2) the same ratio for secondary school enrollments, 3) the number of females enrolled in primary school per 100 males, and 4) adult female illiteracy. Each graph also indicates the regression line based on developing countries with GNP less than \$2,500 so that it is possible to see if the values for the particular countries that are included in the graphs are above or below the average experience of poor countries, controlling for per capita income.

Before turning to any analysis of the information presented in Table 1 or the graphs, it is useful to emphasize that there are substantial limitations to such analyses. Definitions are not necessarily consistent across countries, so apparent differences may be due to measurement errors rather than to real differences across countries.¹⁰ In addition, data on many variables of interest are not included. For example, data are available only on indicators related to formal schooling and not on indicators related to any other form of educational investment.¹¹ Despite such limitations, use of this information is widespread because of a lack of better alternatives.

The percentage enrollments by age groups in primary, secondary and tertiary schooling in Table 1 suggest the following points:¹²

A. Total Enrollment Levels/Rates

Approximately half of the countries in Asia and the Near East had total enrollment levels in

¹⁰ The notes to the tables in the World Bank (1990) from which these tables are constructed indicate some of the measurement problems, as do the original sources from which the World Bank obtained these data. Also see Section 4 in Behrman (1991) for discussion of related measurement problems.

¹¹ El-Sanabary (1989) claims that similar gaps to those for formal schooling also exist in technical and vocational education in countries in the Middle East and North Africa. Also the literacy indicator reflects the impact of whatever forms of education affect literacy – whether formal schooling, literacy programs or informal education.

¹² These comments are based on the percentages of students in certain age groups enrolled in various schooling levels as in the first ten columns in Table 1. Net primary enrollment ratios are available for only a few countries. For the countries for which they are available, they suggest the same relative patterns, though of course the levels are lower.

1965 below those for their respective country groups as defined by per capita GDP.¹³ However, countries in Asia and the Near East on the whole appear to have had average enrollment rates among all developing countries once one controls crudely for per capita income in 1965. Some countries did stand out below (e.g. Bangladesh, Nepal, Pakistan, Papua New Guinea, both Yemens, and Algeria) or above (Sri Lanka, Philippines, Singapore Tunisia, Jordan, and Lebanon) the averages.

In all of the countries of Asia and the Near East for which data are available for both males and females at every level of schooling, enrollment rates increased between 1965 and 1987.¹⁴ The changes varied considerably across countries, with some tendency for larger increases in countries with lower enrollment rates in 1965. Between 1965 and 1987, for example, those countries with the largest increases in total primary school enrollments were 82 percent for the Yemen Arab Republic, 62 percent for Nepal and 48 percent for Indonesia (as compared with an average of 31 percent for all low-income countries). At the other extreme, among countries with higher primary enrollment rates in 1965 (but with total primary enrollment rates below 75 percent), increases were generally smaller, with only a 10 percent increase for Bangladesh, 12 percent for Pakistan and 14 percent for Morocco. Similar patterns existed in enrollment rates at the secondary school level. At the tertiary level, the largest increase was the 19 percent increase in the Philippines, which had an enrollment rate in 1965 that already was above that reported for all but one of the countries of Asia and the Near East in 1987. Increases greater than 10 percent were also reported for Thailand (18 percent) and Egypt (13 percent).

¹³ The country groups in these tables refer to 1988 per capita GDPs, but most of the countries in the Asia and Near East regions were in parallel broad country groupings by per capita GDP measures in the earlier years (the 1960s and 1970s) for which data are given in these tables. However, some -- such as Thailand and Singapore -- moved up one country group during this period.

¹⁴ The single exception to this statement is primary school enrollment in the Philippines, for which there was a decline for both males and females between 1965 and 1987. But this is not an exception of significance since the decline was from 113 percent (111 for females) in 1965 to 106 percent in 1987.

B. Female Enrollment Rates

Female enrollment rates for primary and secondary school (data are not given for tertiary school in World Bank (1990)) were lower in 1965 and in 1970 in all of the Asia and Near East countries than for their respective country group means--with the exceptions of secondary school in Sri Lanka in both years and in Singapore in 1970. (Again, there were substantial variations across countries.) For example, for the countries for which 1970 data were available, the ratio of female to male enrollment ranged from 10 to 89 percent for primary school and from 3 to 103¹⁵ percent for secondary school. Thus, gender gaps in school enrollments were pervasive 20-25 years ago, but varied substantially across countries in Asia and the Near East and tended to be greater for secondary than for primary school.¹⁶

Enrollment rates in Asia and the Near East generally increased more rapidly for females than for males between 1965 or 1970 and 1987.¹⁷ Between 1965 and 1987, the exceptions to this generalization at the primary school level were the Yemen Arab Republic, Egypt and Algeria (with equal percentage increases for males and females in the last two cases). Exceptions at the secondary school level were Tunisia, Algeria, Pakistan, Papua New Guinea, Morocco and Egypt (with equal percentage increases in the last case). For every country in the Asia and Near East regions for which data are available, the number of females enrolled in primary school per 100 males increased at both

¹⁵ These numbers are the ratio of those actually enrolled in a given school level relative to the number of individuals in a country of a specified age range. As a result, if there are students who are younger or older than the specified age ranges, percentages may exceed 100.

¹⁶ From the broader perspective of all developing countries, King (1990) observes that such gender gaps tend to be greater in lower per capita income countries. This is confirmed in the regression estimates in Behrman (1991). The coefficients of the linear per capita real income terms are significantly higher for female than for total primary and secondary school enrollments, which implies a closing of the gender gap in enrollments with higher per capita income (modified somewhat by the quadratic terms in real per capita income).

¹⁷ This is consistent with the regression results in Behrman (1991) that indicated significantly stronger per capita income responses in female as compared to male enrollments given that per capita income generally increased in Asia and Near East countries in this period (see column 3 in Table 3 in Behrman 1991).

the primary and the secondary school levels between 1970 and 1987. Particularly large increases were recorded at the primary school level in Oman and at the secondary school level in Jordan, Malaysia and Tunisia.

In comparison to other countries in the same income groups, female primary and secondary enrollment rates in 1987 in countries in Asia and the Near East tended to be low.¹⁸ But with more extensive controlling for per capita income through cross-country regressions (presented in the appendix), the countries of these regions appear to be closer to the overall experience of developing countries. A number of countries have higher female enrollment rates than predicted with the control for per capita real income. Thus, considering the regions as a whole -- particularly if the relative populations of different countries are considered -- the Asia and Near East regions have approximately average female enrollment rates.

C. Persistence Rates

Among those enrolled in primary school in 1970, the persistence rate to grade four in countries in Asia and the Near East tended to be relatively low, and lower for females than for males. But the gender gap in these persistence rates was much smaller than the gender gap in enrollments and, at times, favored females (e.g. Sri Lanka, Thailand, both Yemens). Relatively large gender gaps in persistence rates (i.e. larger than 10 percent) were reported for Indonesia and Burma/Myanmar (favoring males) and for Sri Lanka and the Yemens (favoring females).

Persistence rates to grade four as a percentage of the number of students who entered primary school increased substantially between 1970 and 1987 (for the cases in which data are available for both years and in which the 1970 rates were low). In the relatively few countries for

¹⁸ King (1990, p. 5) states: "Regional differences in the gender gap are great. Many countries have achieved near universal primary education for males and females. But girls' enrollment continues to lag behind in many others, most dramatically in South Asia, the Middle East North Africa and Sub-Saharan Africa."

which data are available, the increases tended to be larger for males than for females.

D. Comparison of the Stock of Educated Males and Females

As a result of gender gaps in school enrollment and persistence rates in most of the Asia and Near East regions, the stock of educated males in most countries of the regions is larger than the stock of educated females. A comparison of adult and female illiteracy rates in 1985 (Table 1, last two columns) is an indicator of this difference. Female illiteracy rates exceed the overall rates in every country in the Asia and Near East regions. The residuals from the cross-country regressions also indicate that, controlling for per capita real income, female (and total) illiteracy rates are high in the Asia and Near East regions in comparison to the rate for all developing countries. There are striking exceptions to this generalization in Sri Lanka, the Philippines, Thailand, and Indonesia (and for males in Jordan).

3. SUMMARY OF ANALYTICAL FRAMEWORK, RECENT SYSTEMATIC STUDIES AND POLICY IMPLICATIONS

Section 2 suggests that there is a persistent gap between female and male access to educational opportunities in most of the Asia and Near East regions, though the gap has varied enormously between countries. Differences in school enrollment rates have lessened over the past two decades throughout the region, and may have been eliminated in Sri Lanka and some East Asian countries. Nevertheless, they remain considerable in many others. Enrollment rates refer only to the current flow of investment in formal schooling. Evidence of gaps in investment in education other than formal schooling is very sketchy, but seems to suggest similar patterns. Gaps in the stock of educated women and men are likely to remain for decades in most countries of the region.

Such gender gaps in education raise important questions. Are such gaps sensible from the point of view of efficiency? What are the implications for concerns about equity? What are the implications for policy? To address these questions, it is necessary first to ask what is known about the determinants of female education and of gender gaps in education, and then what is known about the impact of such education. Only with an understanding of the causes and effects of female education can policy needs be defined and specific interventions designed.

3.1 Analytical Framework, Measurement and Estimation Problems, and Policy Rationale.

To establish a framework for analysis of such questions, consideration is given to modeling education investment decisions, to measurement and estimation problems, and to the analytical rationale for policy interventions. Modeling suggests how a number of dimensions of demand and supply for education may interact to affect female education within the broader context of household

behavior and current and expected market options, and that controlling for other factors in the estimation of the impact of female education is likely to be critical to avoid biased estimates. The discussion of empirical problems notes that disentangling the effects of female education from those of a number of other variables -- such as innate ability, motivation, and preferences -- is likely to be difficult. The consideration of policy rationales points to the need to identify some market failure - - perhaps due to externalities or increasing returns to scale or public goods -- to rationalize policies that increase economic efficiency. It also points to the existence of a policy hierarchy, in which policies that more directly address the specific market failure of concern tend to be relatively preferable from an efficiency perspective (all else equal). Equity arguments may show that it is desirable to use policies which result in increased inefficiencies, but there still remains a range of policy choices with different costs in terms of efficiency and productivity. Therefore, the efficiency concerns still provide guidance.

3.2 Summary of Systematic Empirical Studies.

Existing systematic empirical studies raise a multitude of questions that merit further research and argue for the replication of some of the more interesting results to test their validity under different conditions. Nevertheless, they suggest a number of insights into the determinants and impacts of female education, mainly formal schooling.

The determination of the gender gaps in education in Asia and the Near East has been subject to relatively little systematic empirical analysis. The available studies suggest that expected gender gaps in paid employment options are often a significant factor in inducing gender gaps in formal schooling and other forms of education to which the payoffs are largely in the labor market. To the extent that this is the case, policy changes that reduce gender biases in labor market

conditions are likely to induce more female education. With regard to formal schooling, however, this is a lengthy process, given the gestation period between enrollment (especially at the primary level) and returns in the form of improved employment opportunities. A study done in Indonesia also suggests that improvements in the health of young children and infants may have a substantial positive effect on secondary schooling of girls by reducing their time spent caring for younger siblings. A study of Pakistan concludes that in rural areas of that country, the largest factor underlying large gender gaps in educational attainment is a gender gap in the public provision of schools.

The impact of female schooling on paid labor market outcomes and on nonmarket outcomes in the Asia and Near East regions, and elsewhere, has been subjected to much more systematic study. Findings suggest that the much larger number of "standard" studies which interpret simple or multivariate associations as reflecting causality may be misleading in a number of respects. The failure to control for sample selectivity seems to cause biases in both directions of the estimated effects of women's schooling on such outcomes. On the other hand, standard studies underestimate the extent to which labor market returns to schooling for women exceed those for men, i.e. given current base levels, equivalent investments in female and male education result in greater percentage wage increases for women than for men. Failure to control for other factors -- such as individual ability and motivation, household encouragement, the quality of schooling, and community learning and employment opportunities -- seems to result in substantial overestimates of the impact of female schooling in standard studies. Estimates that control for such factors imply that the true impact of female schooling on both paid labor market and other outcomes is substantially less than often claimed. Nevertheless, the effects of female schooling do appear prominent and widespread.

3.3 Implications for Productivity, Efficiency, Growth and Other Policies.

Several distinctions are important in considering the implications of the empirical estimates for the contribution to productivity growth.

First, even if more careful analysis substantially moderates the estimated impact of female schooling on various outcomes related to growth, it still implies that female education has a substantial effect on various dimensions of productivity. The estimated rates of return to formal schooling in terms of narrowly defined economic outcomes are fairly large. In addition, there are the effects on nonmarket outcomes. Though there are no estimates that translate the nonmarket outcome effects into rates of return, the nonmarket effects clearly mean that narrowly defined economic rates of return are a lower estimate on total rates of return to female education. Therefore, countries in Asia, the Near East and elsewhere are likely to gain in terms of productivity and growth from female schooling.

Second, the available estimates do not suggest a strong reason for policies that induce more investment in female education on efficiency grounds, when it is considered in isolation. In fact, there is very little information on the existence and importance of social benefits (externalities) beyond the private benefits. The fact that women's education has significant positive effects on their productivity in a range of activities does not imply that there is an efficiency-based argument for policies that directly or indirectly subsidize female education. Available studies show that these estimated effects are basically private benefits, not social benefits, and therefore should be realized without subsidization.

Often times the important nonmarket effects of female education are interpreted to mean that there are efficiency reasons for policies that favor female education, but that conclusion does not necessary follow either. Many of the nonmarket benefits are private benefits. Better health for

a woman or her family has a considerable private component to the total benefit. The available studies do not provide evidence of any externalities that might justify policy interventions to favor female education.

Many believe that there are important negative externalities associated with population growth, including pressures on public health and education systems and increased pollution and environmental degradation, and female education is a means of slowing population growth. If this is the case (which is a matter of considerable debate) then it may provide a reason for advocating policies that promote female education in order to reduce such negative externalities. The considerations underlying the discussion of the policy hierarchy, however, would not point to increased female education as a first-best policy. The first-best policies are ones that are aimed directly at the distortions. If there are social costs above private costs if more children are born due to public subsidies for health and education, the first-best policy (from an efficiency perspective) is likely to be increased prices for those services to the point at which their price equals the social marginal costs of their provision. The point is that increased female education, while possibly working in the right direction to help eliminate such distortions, is not likely to be the first-best policy.

Third, with regard to the allocation of resources between female and male education, the empirical evidence supports some shift of resources towards females. The estimates tend to indicate that economic rates of return for investments in female schooling are equal to or higher than those for male schooling. In addition, evidence on the nonmarket impact of female education reinforces somewhat the argument for shifting resources from male to female education, despite the frequent overestimation of benefits. These considerations certainly do not support the maintenance of present gender gaps in school enrollments that favor males in most countries in the Asia and Near East regions, and if anything, they argue for favoritism towards females. To the extent that this gap arises from policy-related supply considerations, then efficiency considerations argue for elimination of the

gender gap in schooling supplies that currently favors male enrollments. To the extent that enrollment gaps are due to demand factors, then the implications are less clear, depending upon the nature of such factors.

3.4 Implications for Concerns About Equity.

There seems much less ambiguity regarding equity than regarding efficiency in considering female education in isolation. If society were to weigh all persons equally, the present gender gap in formal schooling enrollments in most of Asia and the Near East is inequitable. There is a conceptual possibility that other forms of education that offset this imbalance. For example, girls who are not in school may be obtaining informal education in household productivity that is of equal value as would be formal schooling, but that is highly unlikely. There also is the conceptual possibility that, given preferences, the gap is perceived to be appropriate due to differential disutility costs of female versus male involvement in certain activities, but rapid socio-economic change and future uncertainty somewhat weaken this explanation and its implication that measured gender gaps do not reflect real gaps.

3.5 Considerations of More Specific Policy Options.

Actual policies take specific forms, such as increasing fees at universities, conducting literacy campaigns for women, or establishing formal training programs for women. Adequate evaluation of specific options in a particular context requires substantial specialized knowledge of a number of dimensions of local conditions and institutions. These conditions vary enormously even within some of the countries in Asia and the Near East, to say nothing of across countries. Therefore a broad

survey such as this can only be suggestive regarding what is known and not known about policies from a more general perspective. However, the material covered in this survey does give some basis for greater specificity.

Policies related to the demand for female education: The analytical framework suggests that an important determinant of female education is various components of household demand for such education. This demand, in turn, is related to current or expected conditions in various markets and surrounding public services, as well as to current and expected nonmarket activities and gender specializations.

- Imperfections in capital markets. It is widely perceived is that imperfections in capital markets are common in most developing countries, with negative ramifications for the poor who tend not to have much access to such markets. But the available systematic studies suggest limited effects of capital market imperfections on education. Nevertheless, since there are many who believe that capital markets are fairly imperfect in much of the Asia and Near East regions, it may be worthwhile to undertake some pilot projects that attempt to measure the impact in different country contexts of different loan programs for investments in education for girls from poor households, with careful monitoring and controls.
- Expected impact on subsequent outcomes. The analytical framework and empirical estimates suggest that one important component of the demand for education is the expected impact on subsequent outcomes. Therefore, it appears that expectations of better access for women to labor market options would induce increased demand for their education of various forms. Such expectations might be formed in part by policies that serve to eliminate any discrimination against women in those markets.

- **Household resource allocation.** Demands for education are household demands that reflect the overall allocation of resources that occurs within the household and the various constraints under which the household operates. Some of the studies summarized in this review suggest that the opportunity cost of time that older daughters spend in household activities (explicitly in one case, care of younger sick siblings) has a substantial negative effect on their school attendance. In such cases, policies that led to improved health of younger children and infants would induce more schooling attendance for older girls and also might induce more training and stronger job attachments for older females. Such possibilities mean that the efficiency and equity arguments for policies that improve child health may be stronger than it would appear from considering only the direct effects on child health, and should be incorporated into the analysis of such policies.

- **Child care arrangements.** If household structure in Asia and the Near East continues to change so that nuclear households become more common, the nature of child-care arrangements may be of increasing importance for female education directly (both for schooling for older daughters and for training for women) and indirectly (by affecting expectations regarding labor market and own-enterprise options and the possibilities of stronger job attachments). Though there have been no systematic efforts to explore the impact of alternative child-care arrangements in countries of Asia or the Near East that were uncovered in this survey, it is likely to be a topic of increasing interest. Some pilot projects might well be warranted, especially given that suggestive examples exist from other regions.

Policies related to supply side for female education: In certain settings, supply characteristics may directly or indirectly be responsible for large gender gaps in school enrollment.

- **School availability.** A study of rural Pakistan concludes that the gender gap in (single-sex) school availabilities accounts for the majority of the rather large gender gaps in schooling attendance, completion of various schooling levels, and cognitive achievement. In such a case, there is a policy-induced distortion that probably causes both inefficiency and inequity. The policy remedy would be to at least equalize access to schools for females and males. Experimental programs are underway in several Asian countries and elsewhere in the developing world that suggest that access to females can be improved effectively with satellite feeder schools for the initial grades in remote rural areas, flexible hours, hours that do not conflict with other activities, and perhaps greater flexibility in seasonal patterns.

- **Quality of education.** On a priori grounds, increased quality of educational institutions is likely to increase the rates of return for any given period of time spent by an individual in that institution (unless there is associated with the quality improvement an even greater upward shift in the cost of education). Some studies in other developing countries suggest a substantial impact of various dimensions of schooling on test scores and on post-school labor market outcomes. The studies reviewed in this survey for the Asia and Near East countries report significant but not very substantial effects of schooling quality. There also is little systematic empirical evidence related to the efficiency of the use of inputs in educational institutions in the these countries. Therefore, experimenting with variety of institutional forms, public and private, with careful control for selectivity of students in the analysis, may prove quite valuable in improving the policy basis for recommendations regarding these issues.

- **Level of Schooling.** There is a fair amount of evidence pertaining to the relative rates of

return to various levels of formal schooling. Many claim that such returns are much higher for primary than for higher levels of schooling. The studies reviewed in this survey suggest, however, that the standard estimates substantially overstate the returns to primary schooling relative to higher levels by failing to control for estimation problems. Moreover, the evidence on positive externalities is mostly speculative, and the externalities may be more likely to be important for the higher schooling levels. For these reasons, the efficiency arguments for policies that favor lower over higher levels of schooling often appear to be overstated. Nevertheless, the current large discrepancy in public resource per student (strongly positively associated with the schooling level) probably means that the appropriate resources shift from the point of view of efficiency alone would be toward lower schooling levels.

- **Type of education.** There is a range of alternatives for female education that are practiced in different countries of Asia and the Near East, or that are conceivably viable. Policies can affect such programs through a variety of means including direct governmental supplies of education, governmental regulations and price/subsidy/tax policies that affect private suppliers, individual taxes and subsidies. There is very little systematic evidence that permits one to sort confidently among these alternatives, apart from findings on the relative ineffectiveness of vocational education.

- **Vocational education.** There seems to be a growing consensus that vocational education is less effective than general education. Training conducted in industrial institutes and vocational secondary schools appears less cost-effective than informal, firm-based training. Short courses tend to be more cost-effective than long courses, though it is not clear that studies on this topic control for some important characteristics, such as individual abilities and

motivations. If this consensus is correct, it may imply that a selective strategy is desirable, with emphasis on generic pre-employment training in low-income countries (where firms usually have very little training capacities) and focus on training related to new technologies in firm-based and industry-connected contexts in middle-income countries.

- Pricing of publicly-provided education. There are a number of proposed policy changes to the effect that rather than charging low and uniform prices for different levels and types of public education, selective user fees should be charged for higher and specialized forms of education for which the private benefits are substantial and tend to go to the better off (given enrollment patterns by income and socioeconomic class), with the extra proceeds targeted to assure greater access of the poor to education. The claim that successfully carrying out this program would lead to greater equity and efficiency seems likely to be valid, though there remains considerable lacunae in our knowledge of the technical and administrative capacities needed to target successfully subsidies to assure the poor's access to the types of schools for which user charges are introduced or increased, but in most cases, usual targeting problems do not arise when girls' schooling is subsidized.

Research needs: The considerable importance of supply policies in creating a large gender gap in the case of rural Pakistan raises the question of whether supply sources of such gaps are not more important than often claimed, so that it would be useful in thinking about policies to know more about similar decompositions of gender gaps in education in other contexts. There are a number of technical issues regarding the estimated impact of female schooling on various outcomes that need to be explored further. But perhaps most important in this area is that very little is known about the magnitudes of the various market failures such as externalities that are at the heart, often

implicitly, of efficiency arguments for policies that favor female education (as well as male education). Finally, the more systematic available evidence that has been uncovered and reviewed in this survey focuses almost exclusively on schooling, which means that there may be considerable returns to undertaking careful pilot projects and related research to investigate the relative returns to other forms of female education.

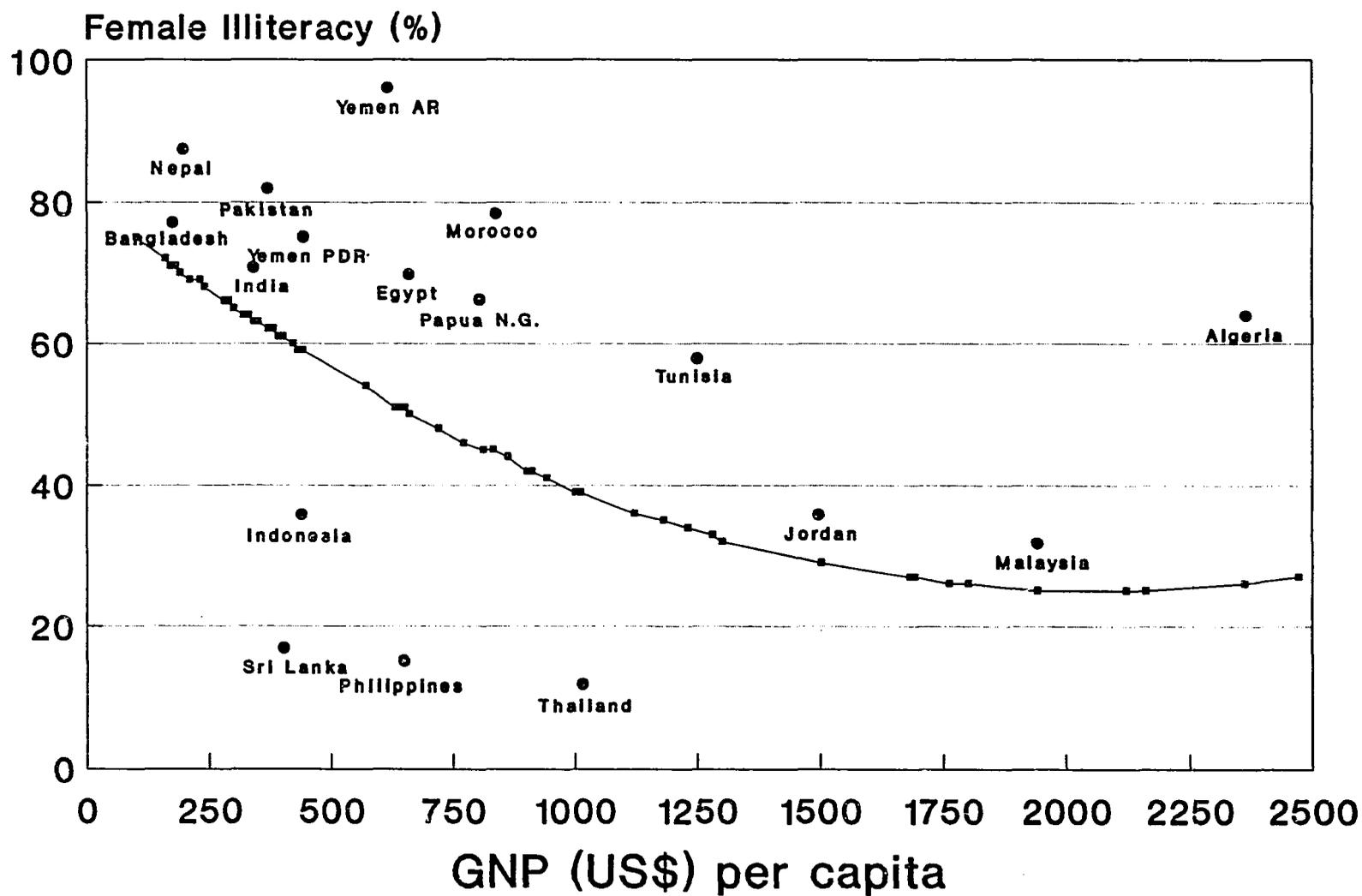
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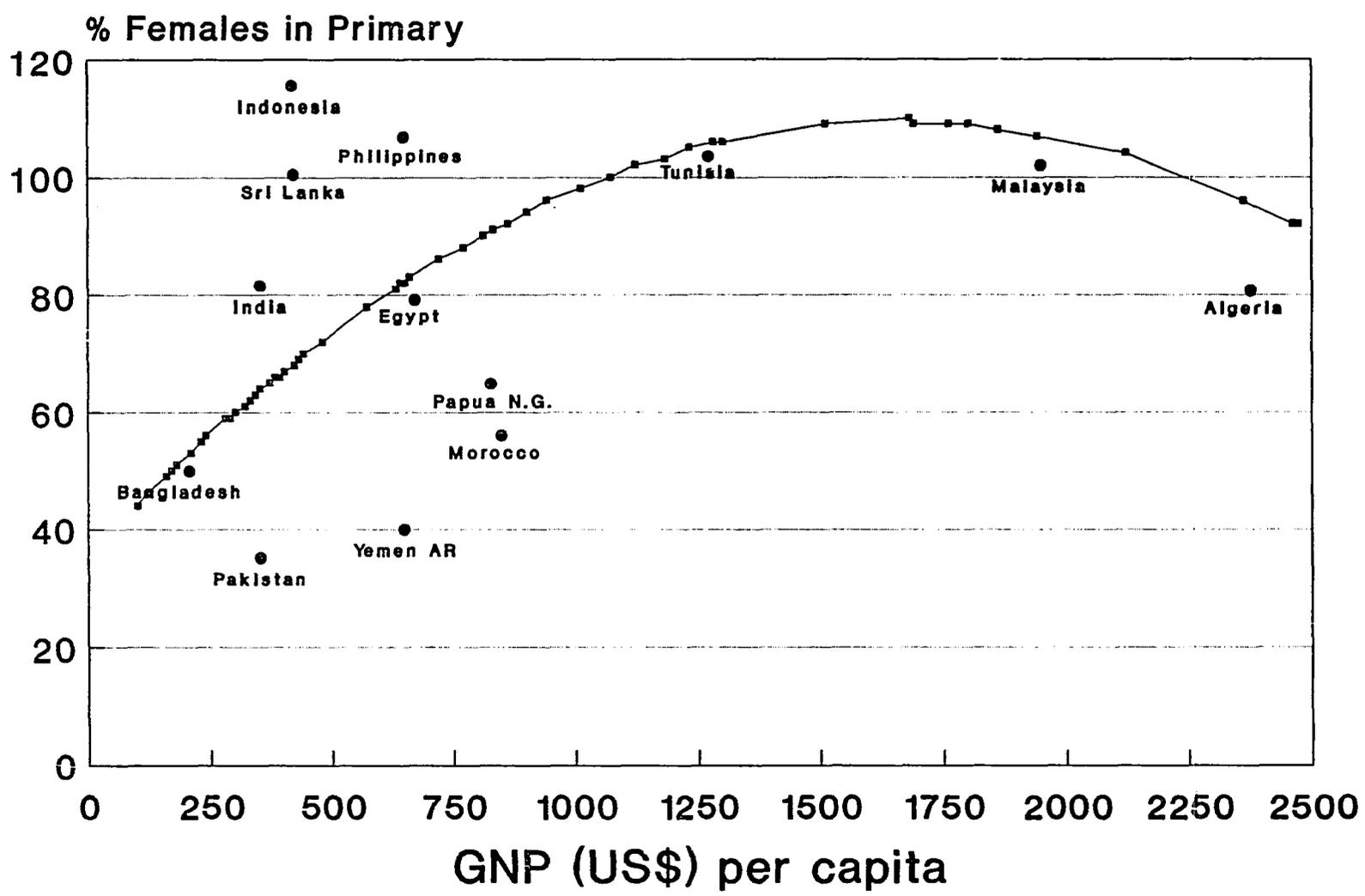
**Appendix: Graphs of Key Variables Against Per Capita Income
and Average Experience of All Developing Countries**

Female Illiteracy 1985



Regression line represents all developing countries with per cap gnp < \$2500; performance controlled for income.

Percent of Age Group Enrolled Females in Primary School (1987)



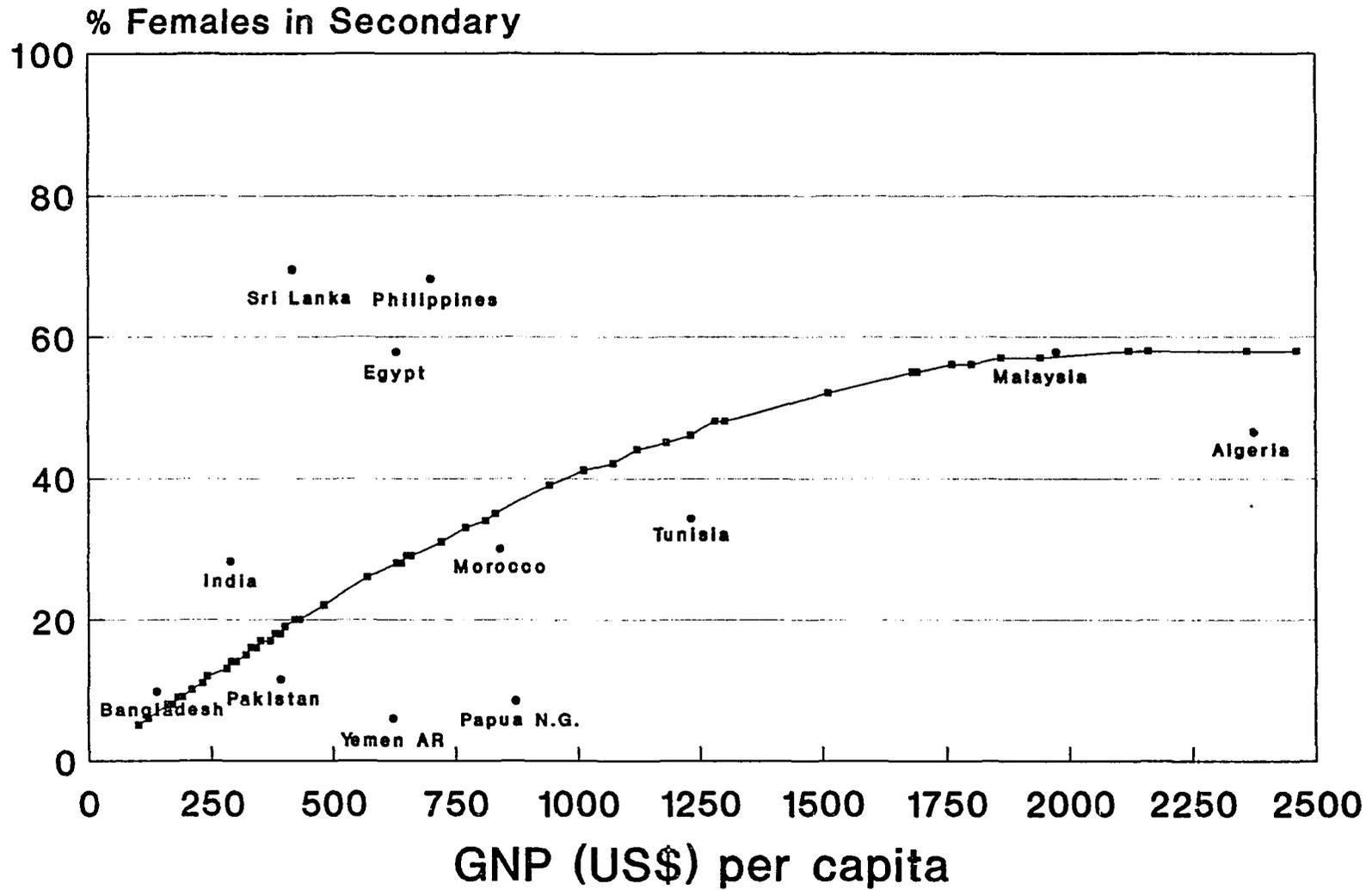
Regression line represents all developing countries with per cap gnp < \$2500; performance controlled for income.

A-2

100

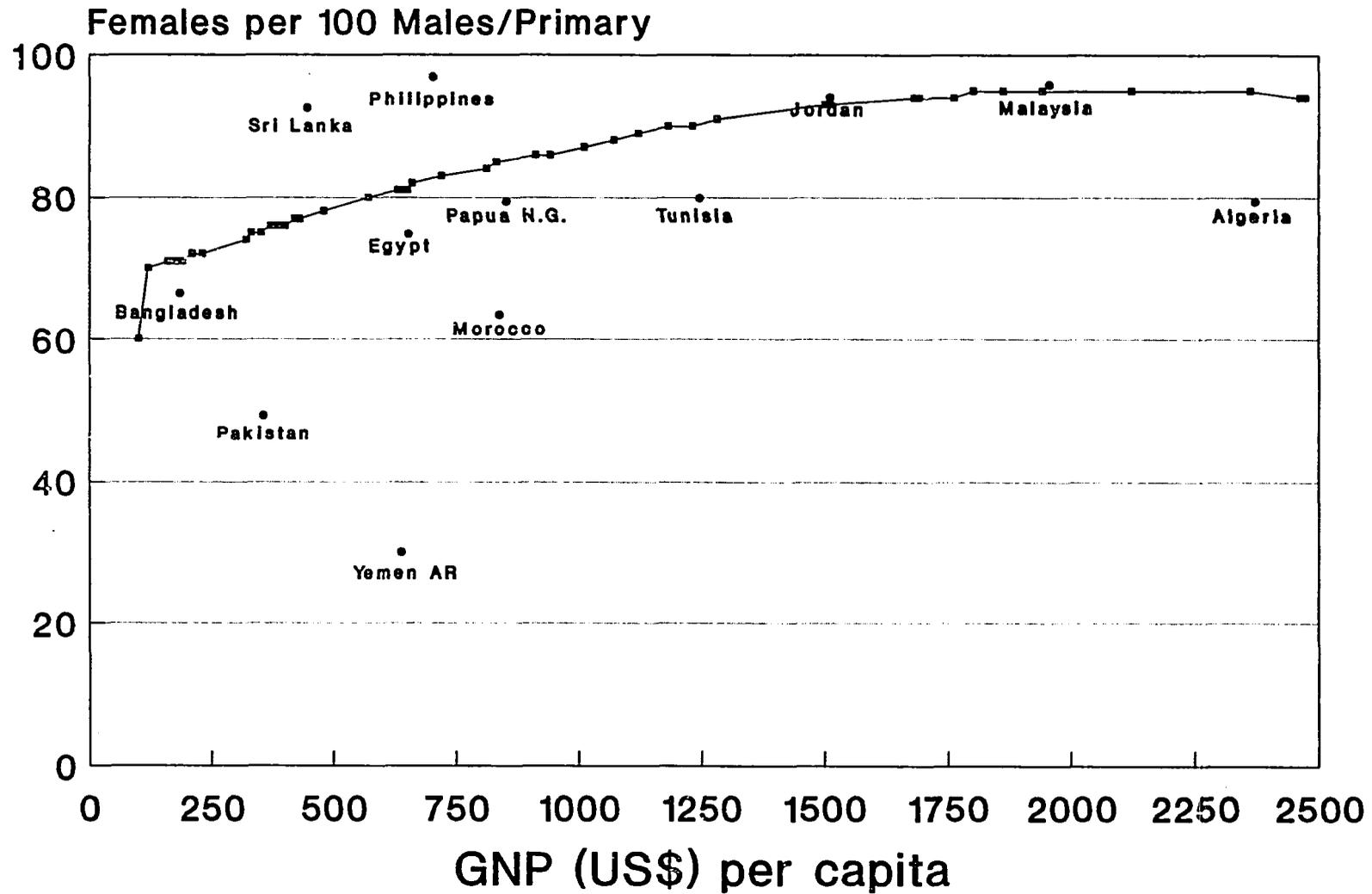
Percent of Age Group Enrolled Females in Secondary School (1987)

A-3



Regression line represents all developing countries with per cap gnp < \$2500; performance controlled for income.

Females per 100 Males in Primary School (1987)



Regression line represents all developing countries with per cap gnp < \$2500; performance controlled for income.