Nutrition and Agriculture

This chapter shows some of the causes and effects of the generally poor nutritional status of many women in developing countries. It also illustrates the interrelationship of nutrition, workload, and health in the context of women’s energy expenditure on agricultural and domestic chores. As the problems of poor rural women have common roots in many countries and regions, issues have been selected for their broad applicability and should not be interpreted as isolated phenomena of the particular community studied. As a representative of the Ministry of Health in Zimbabwe recently reported, "Travelling across many countries of Africa, I felt that I was talking to the same woman."

Much of this material repeats a familiar message in a variety of different settings: in poor households and communities, women work harder than men but eat less. Similarly, it can be seen that in most instances men earn more than women, but contribute less to family prosperity, health and wellbeing. Given the high energy costs of poor women’s combined productive and reproductive roles, the impact on their health of a heavy workload and insufficient nutrition is substantial.

Key points are identified as follows:

$ the differences in men’s and women’s lifestyles and roles place women at greater risk of nutritional deficiency than men.

$ where the social status of women and girls is low, their access to food and medical treatment is restricted, resulting in lower health status.

$ age and gender affect the quality and quantity of food allocated to household members; women, particularly junior wives, are disadvantaged in this allocation.

$ expanded cash cropping negatively affects local food availability and increases women’s workload.

$ more attention is needed to the issue of rural women’s energy expenditure compared to their intake;

$ men’s agricultural labour in an African community does not significantly affect family nutrition levels.
the seasonal energy deficit of rural women in three developing countries produces varying physical and metabolic responses.

the gender division of labour generates disproportionate time and energy costs to rural women.

farming in marginal areas has greater health impact on women than on men.

the price of conflicting agrarian and reproductive policies in China is paid by women.
Nutritional deficiency and women's health

Most nutrition interventions in developing countries have been designed primarily to reduce malnutrition among children. Even programmes which include women tend to focus on pregnant and lactating women. This approach limits the success of interventions since action to improve nutrition-related reproductive outcomes is most effectively implemented before women become pregnant, and preferably should be undertaken before girls reach reproductive age. The different circumstances of men and women in developing countries affect women's nutrition, and it is necessary to take such differences into account when designing nutrition interventions.

The major nutritional deficiency diseases of concern in the developing world are protein-energy malnutrition (PEM), iron deficiency anaemia, iodine deficiency disorders (IDDs), and Vitamin A deficiency. All four show gender differentials in prevalence and severity, with three of the four representing a more serious problem for women than men: the prevalence of PEM is significantly higher among women in South Asia (where almost half of the world's undernourished people lives); both iron deficiency anaemia and goitre are more prevalent among adult women than men, although vitamin A deficiency appears to be more prevalent among boys than girls.

A dearth of good epidemiological data on adult nutritional status, and lack of appropriate reference standards, make it difficult to estimate accurately the extent of malnutrition among women in the developing world. Conservative estimates suggest that of the 1.130 million adult women living in developing countries in 1985, over 500 million were anaemic due to iron deficiency, almost 500 million were stunted as a result of childhood PEM, about 250 million at risk of disorders due to severe iodine deficiency, almost 100 million suffering from goitre, and almost 2 million blind due to Vitamin A deficiency. A problem of this magnitude cannot be dealt with through narrowly targeted feeding programmes for pregnant and lactating women, or by relying on the long-term effects of economic development programmes.

Some health consequences of poor nutrition

Data from 32 studies examining PEM among women in developing countries established that women generally consumed only about two-thirds of the WHO recommended daily allowance for energy, and that their average weight-for-height was well below the average for small-frame women in the US. Other studies have
established that the energy-intakes of pregnant and lactating women only marginally exceed those of nonpregnant, nonlactating women. The long-term negative reproductive consequences of childhood PEM are fairly widely accepted. It is well established that stunted women are at higher risk of obstructed labour, itself a major cause of maternal mortality.

Iron deficiency anaemia is the most widespread nutritional problem among women, and has severe consequences for both their reproductive and productive roles. Maternal mortality rates are significantly higher among anaemic women, as are prematurity and infant mortality rates. Although there is limited direct evidence concerning the effect of anaemia on women's physical work capacity, research on men shows a clear association between iron deficiency anaemia and reduced work capacity. Because low-income, rural women living in the tropics experience the highest rates of iron deficiency anaemia (along with other forms of malnutrition and morbidity), and also some of the most physically demanding work responsibilities (including weeding, threshing, pounding, fetching fuel and hauling water), it is probable that anaemia among women accounts for a significant loss of productivity, and therefore of family welfare, in developing countries.

Iodine deficiency disorders are of particular concern since they can result in severe negative reproductive outcomes for both mothers and infants. Evidence from 19 studies shows that prevalence of goitre appears to be higher among women, with the gender differential first appearing in adolescence and becoming much more pronounced among adults. Severity increases in women with increasing age, but declines significantly in males after adolescence. Although the reasons for higher prevalence and greater severity of goitre among women are not well understood, similar patterns in developed and developing countries suggest that at least part of the reason can be attributed to biological differences, perhaps aggravated by socioeconomic or behavioural factors.

Adolescent mothers are more likely to have low birthweight infants. This is due to a combination of shorter average maternal height, competition for nutrients between the still-growing mother and the fetus, and poorer placental function in adolescents. Interestingly, adolescent mothers need to gain more weight than older mothers to have a normal weight baby. Concurrent pregnancy and growth in low-income adolescent girls also has a significant negative effect on the micro-nutrient status of these mothers.

**Links between social and nutritional status**

Two aspects of the status of women appear particularly relevant as probable indirect determinants of their nutritional status. The first is the cultural importance of childbearing in terms of a woman's status and her fulfilment of family expectations. In developing countries, women are usually under considerable pressure to bear children, sometimes to the extent of having as many, closely-spaced children as
possible. Another aspect affecting nutritional status is gender bias (where it exists) in intrahousehold food distribution. Some studies, based primarily on data from South Asia, have found less adequate consumption of nutrients on the part of adult women compared with men. While lower requirements may provide a partial explanation, it is unlikely that they account for all or even most of the generally poorer dietary intake of women, particularly since women often work longer hours and/or do more strenuous work than men.

Food proscriptions also affect women's nutritional status. Most societies have recommended dietary practices for pregnancy and lactation, and there is evidence from numerous cultures that meat and other high-protein foods are withheld, sometimes from women in general but most frequently from pregnant and lactating women. Women may themselves restrict their food intake during pregnancy to reduce fetal size and facilitate delivery. The effects of these practices on women's nutritional status are not known.

The lives of women in developing countries differ from those of men for cultural, biological and socioeconomic reasons. These differences place women at significantly higher risk than men of malnutrition and mortality. The importance of women's nutritional status to their own health, productivity, and quality of life, and to the survival and healthy development of their children and other family members who depend on women's domestic and market work, warrant serious efforts to reduce malnutrition among women.

Summary of the work of:

Gender differences in access to food and health care in India and Pakistan

Inadequate nutrition in women is often a function of gender biases in access to food and health care. Where early marriage is practised, this deprives women of the benefits of education and the nutritional awareness it may bring. Poor women in India and Pakistan are often exposed to the double energy demands of gruelling agricultural work along with early and frequent childbearing.

Studies in Punjab, India, show that social discrimination against young girls in nutritional matters has persisted despite agricultural growth and economic development in the area. Even in privileged families, some girls may be malnourished. Indeed, the gender differential in food consumption among children from birth to four years was higher among landed classes than in landless families, with evidence of selective discrimination against daughters of second or higher birth order. This suggests that demographic transition in the region has worsened the status of female children, since their mothers continue to be under great pressure to bear and nurture sons. In West Bengal, general village improvements have resulted in better nutritional status for boys, but not for girls. Additionally, women receive a disproportionately small share of household food, despite their greater energy expenditure on household and farming activities.

Gender differences in women's childcare and feeding practices are established early. Girls are breast-fed less frequently, for shorter durations, and over shorter periods than boys. Weaned early, they may not receive sufficient quantities of supplementary food. Documentation of the quality of food in several cultures has shown that male children generally receive more cereal, fats, milk and sugar than female children. Higher calorie and protein intakes by males of all ages have been documented for Bangladesh. Girls' lower levels of health care, combined with differences in feeding patterns, expose them simultaneously to higher rates of malnutrition and longer periods of more severe morbidity, contributing to their significantly higher mortality.

Low food intake during pregnancy is common in both India and Pakistan. Studies have shown that women consume little or no extra food during pregnancy, and may even consciously limit their intake for fear of large fetuses and difficult labour. Food taboos not only deprive women of protein and iron sources, but also reduce calorie intake. In both countries, very high female mortality has led to an abnormally low female to male sex ratio of 933 and 904 women per 1,000 men respectively in 1981.
Seasonal shortfall in food availability tends to affect women disproportionately since their already inadequate intake will be curtailed drastically. Even when more food is available, it tends to be preferentially allocated to men, thus preventing women from accumulating any reserves. If seasonal shortfall coincides with pregnancy or lactation, the implications for women and infants are particularly harsh.

These deep-rooted social prejudices are also seen in relation to women's access to and use of health services. One study found that while females outnumbered males four to three among children suffering from kwashiorkor, over 50% of related hospital admissions were boys. A survey in Maharashtra revealed that although higher percentages of girls were ill than boys, lower percentages received medical treatment in the under-15 age-group. Girls tend to be taken to less qualified doctors than boys, and have less spent on medicine for them. In general, better and more timely medical care for boys may be the main factor accounting for the higher survival rates among males.

These trends demonstrate that households discriminate against female children in relation to health care in much the same way that they do in nutritional matters. These patterns continue in adulthood. A larger proportion of adult women than men receive no treatment, and women tend to be treated mainly through home remedies or traditional medical care, while men receive institutional care. Hospital, clinic and primary health centre records in India and Pakistan invariably show that a greater number of males than females receive treatment as many as five times more. Female illness is, however, frequently underreported due to women's reluctance or inability to seek medical care, or deliberately downplayed due to constraints such as time, expense, or stigma. This can become a vicious circle as untreated female illness causes increased morbidity.

As women continue to bear the brunt of the hard labour in poor countries, it is important to foster the concept of improving women's nutrition and health for the sake of women themselves, rather than just for that of their children. The nutritional status of women during adolescence could be improved considerably, with spin-off benefits for their future infants. In the short-term, supplementary meal programmes for adolescent girls could have long-lasting benefits, while in the long term, structural and cultural changes are needed.

Summary of the work of:
It is now acknowledged that malnutrition does not affect all members of a household equally, except in times of famine. Food is not equally divided within households, but reflects the order of precedence and perceived social value of the consumers, as well as factors such as religious practices. Studies of food distribution in both developed and developing countries note that food distribution based on sex differences always favours males. Unequal food distribution is further suggested by differences in morbidity and mortality within households. Effective development interventions therefore require knowledge of household resource allocation patterns. This is important given the heavy workload borne by poor women in both rural and urban settings.

Preferential food distribution refers to increased quantity and/or quality of food, as well as less obvious factors such as serving priority. In many societies, it appears that behaviour rather than absolute quantity of available food determines nutritional status.

Distribution of food usually favours males as their economic contribution is thought to be greater. Some children may receive preferential treatment based on their anticipated future contribution to the household. In Nepal, existing evidence points to age, sex, and perceived current and future economic contribution as the primary individual characteristics determining intrahousehold food allocation patterns.

This investigation of patterns of food distribution within households was carried out in six ethnically diverse hill villages in rural Nepal, using both anthropological and nutritional science methods.

In most of the households surveyed, the food servers were adult women. Young children tended to be served automatically, but those aged between 7 and 10 years served themselves more often than they asked for food. Food serving methods varied substantially by sex from early adulthood. Men, unlike women, were served automatically and with increasing frequency. This trend continued into old age. Women were much less likely to be served, and usually served themselves. Guests were frequently required to eat second helpings, whereas lower status household members had to ask for more. This becomes important when there is little food available for second helpings. Second-helping scores for young women were particularly low, leaving them nutritionally vulnerable at an age where they marry and move into their husband’s home. There they have very low status; as junior females in the household, they are served automatically but are expected not to ask
for food. When their status rises to that of food server, their access to food increases. The server's access to leftover foods from other household members also contributes to their score.

**Channelling and taboos mean lower food intake for women**

Food channelling, giving or offering food items to one person but not to another, was also a clear source of differentiation. Channelled foods tended to be the more expensive or higher status foods, especially animal products. Young children (both boys and girls) appeared to receive such foods more often than adults, although by ten years of age channelling scores were higher for boys than for girls. The difference was significant for those in early and mid-adulthood, when channelling scores for adult males were higher than for females. For both sexes, channelling appears to decline with age.

Senior males were observed to receive large portions of a desirable food while adult women received a disproportionately small share. Food proscriptions applied mainly to women, and appeared to have an overall negative effect on women's dietary diversity and intake. The following foods were often served to other household members and not to adult women: soybeans, wild green leafy vegetables, potato pickle, banana, mango, fish, eggplant, cow milk yoghurt, cow milk ghee, buffalo milk, and chili. Women consumed wheat products, pork, chicken, eggs and liquor even less frequently. Some foods, considered difficult for infants to digest, were avoided by nursing mothers. Foods in this category are not in short supply and there is no reason to avoid them apart from food belief systems. Animal products are in high demand and short supply, and preferentially distributed to adult males and small children. Channelling food away from women therefore appears to be due to a combination of food beliefs and low status.

Examining calorie intake, beta-carotene intake, riboflavin intake, and vitamin C intake, adult women scored lower than children and males for all substances. This raises concern about the nutrient intake of adult women, who have active daily work routines, culturally prescribed dietary restrictions and additional nutritional needs if pregnant or lactating.
This study demonstrated that while all women were disadvantaged vis-à-vis men regarding food intake, the most disadvantaged group consisted of young adult females, who performed most of the heavy domestic work but consumed the least and lowest status foods. Adolescent girls were also disfavoured, and at the time of life when they begin domestic labours such as water and fuel collection. Adolescent boys, on the contrary, tended to receive a large amount of food proportionate to body size.

Summary of the work of:
Cash crops, food crops and "women's work"

The importance of women's domestic and food production responsibilities has often been neglected by planners and policy makers in the development process in rural Africa. In the subsistence sector, this has marginalized women by reducing their productivity and control over resources and shutting them out of development processes, while concurrently increasing their workload. These factors, combined with mechanization and the increased importance of a cash economy, have serious implications for women's health and nutrition.

In Africa, the traditional division of agricultural labour assigns women specific tasks. They rise before dawn to fetch water, and cook, then walk to the fields for planting, weeding and harvesting. On their return home, they gather firewood, process and cook food, and tend their children. In addition, beer must be brewed for festive occasions, and goods or excess agricultural produce carried to and from the market on market days. Yet, all this labour is statistically invisible to policy-makers and planners, and only marginally reflected in labour and income statistics, since these discount work performed outside the market system. The International Labour Office (ILO), for example, defines economic activity as that which produces commodities or services for exchange on the market. This exclusion of subsistence food production renders the bulk of women's work invisible.

Changes associated with the introduction of capital into rural Africa have also affected women's workload. New technology may have reduced the time it takes to process traditional crops, but the expansion of the area cultivated has led to a reduction in forest cover; it now takes longer to collect firewood, and the family fields may be located farther away. Education of children exacerbates some of these problems since it deprives women of the assistance of their older children.

The key factor has been the replacement of subsistence farming with cash cropping. Cash crops frequently displace food for local consumption, forcing African peasants to bring more marginal land under cultivation, which leads to environmental degradation and desertification. In areas where male out-migration has increased, stimulated by the availability of mining and other jobs, wages paid to men are generally insufficient to meet family needs. In such cases, the burden of subsistence food crop production falls entirely on women. This can be overwhelming, given that African women frequently have no land rights and little or no decision-making power. Moreover, the dominance of cash cropping and the allocation of the best
available lands for this purpose means that agriculture has become separated from the local diet. Nutrition levels have suffered accordingly.

Changes in the traditional systems of social organization brought about by the development process have also disrupted the complementarity of the roles of the two sexes and the sharing of responsibilities. Women have taken over tasks traditionally outside their domain (for example when men out-migrate) but men have not done likewise as they are unwilling to do "women's work."

The first assumption of new roles occurred during the colonial era, when males were given the opportunity or obligation to undertake new responsibilities. This helped ensure that women remained largely responsible for food crop and livestock production, to both guarantee the food supply and protect family property rights. Land tenure patterns traditionally ascribed ownership to males, but granted usufruct rights to women. Women's ability to produce food was contingent upon access to land through the family of a husband or his lineage group. It is women's productivity, now as then, which still largely determines how much food will be available for consumption, although not how much they themselves consume.

**Living standard determined by women's income?**

Female labour is crucial for the production of men's cash crops. But it is now also vital that women derive a cash income from trading if they are to purchase additional food and other household necessities. Although women's cash income is comparatively smaller than men's, it is often more significant in terms of a family's standard of living. Moreover, women spend their incomes on the family, whereas men tend to spend theirs on themselves. Women may in fact remain free to spend their own income only because men recognize that they are reinvesting it in family needs, and not accumulating capital independently. Male earnings and social activities, particularly the consumption of alcohol, are becoming increasingly detached from family activities and responsibilities, and are often reported by women to be a serious drain on household income and resources.

Women's heavier responsibilities, and the difficulties they experience in carrying them out, lead to conflict between their various roles and reduce their limited leisure time. Dietary practices have further health implications since women customarily allocate more and nutritious food to men, while making do with bulky, low-calorie staples themselves. Food taboos, which most often relate to high-protein foods, apply least often to adult males. Few men seem aware of the potential nutritional deficits of their wives and children.
The many health problems of African women are exacerbated by overwork and poor nutrition, which are indicators of the low status of women in traditional societies. If the development process is to become more effective, women's vital role in productivity and family well-being must be given official recognition and must be properly recompensed. The African food crisis will not be resolved unless accurate information concerning women's and men's specific activities in food production, processing and marketing is made widely known and the appropriate policy decisions taken.

Summary of the work of:
Women's access to food

Behind most food security policies lies the assumption that once a household obtains sufficient food, all its individual members will be adequately nourished. The Indian experience shows that improving a household's access to food does not guarantee that the women in the family will receive sufficient food. Gender bias in nutritional status and food distribution within the family has been recognized only recently, despite an abundance of data on the issue. With the advent of the UN Decade for Women, further research on female nutrition was undertaken, nearly all of which underlined the fact that most development initiatives had either ignored women, failed to recognize their particular problems, or even worsened their situation.

Most nutritional surveys in India monitor the status of households rather than that of individuals, using the Consumption Unit which is based on norms rather than actual intake. One Consumption Unit is the recommended daily calorie intake of a male sedentary worker, and all other age-groups, sexes, and activity levels are taken as a proportion of this measure. There is little evidence that Indian women actually receive even this proportion of the family's food resources.

Concern over women's nutritional status is confined to pregnant and lactating women, their nutritional and health status prior to and after these stages receiving little or no attention. These women are defined, along with pre-school age children, as a "vulnerable" group and the traditional recommendation has been to provide supplementary nutrition to offset some of the ill effects of their nutritional status quo. However, this approach leaves the nutritional needs of the vast majority of poor women unaddressed, and provides a partial explanation of the declining female: male sex ratio, higher female infant mortality rates, and high maternal mortality rates.

A 1981 study by this author showed that when the total human energy contribution to the village examined were disaggregated, the respective contributions of men, women and children were 31%, 53% and 16%. These figures seemed the first concrete substantiation of the fact that women in India work harder than men. It was then decided to try to calculate the energy expenditure of individual women, men and children in terms of kilocalories and compare this with actual food intake.

This undertaking revealed certain telling biases. For example, many important activities undertaken regularly by the poor had never been measured for their energy costs. Nutrition textbooks provided calorie costs for piano-playing and typewriting,
but not for fetching water or gathering fuelwood. Likewise, few agricultural activities were measured compared with military and industrial activities. Even if agricultural activities had been measured for men, no female equivalents were available. The few energy cost figures available for men included activities such as sewing and singing, and women in general were listed under the heading of "sedentary people".

The 1981 study calculated daily kilocalorie expenditure on various agricultural and domestic activities at 2473 for men and 2505 for women. Average daily intake of kilocalories per man was estimated at 3270, and 2410 for women. Thus, women faced both a relative deprivation in comparison with men, and an absolute deficit vis-à-vis their calorie expenditure. It was demonstrated that women's daily energy expenditure was likely to be higher than men's, particularly in rural settings where men's work is seasonal but women's is continuous and includes domestic and reproductive chores.

Neither of the two classic approaches to undernourishment increases total food supply, and targeting "vulnerable" groups addresses the issue of the energy output of women; or, stated otherwise, the nutritional benefits of decreasing their workload. The current approaches can be summed up as attempts to create a healthier donkey to flog.

**Deteriorating health and nutritional status**

Adult women's weights are well below par in all Indian states. Women's weight gain seems to cease after the age of 16 years, whereas men continue to gain weight until at least 25 years of age. This suggests that men's access to food is greater, especially between the ages of 16 and 25. Average weight gain in pregnancy of 4\(\text{B}6\) kilograms is significantly below the recommended level of 10\(\text{B}1\)2 kilograms.

The Nutrition Foundation of India has ascertained that in some economic "boom" areas, the health and nutritional status of women has actually deteriorated, and the incidence of low birthweight babies and neo-natal mortality increased quite sharply. This is attributed to the need for women to work much harder and for longer than before, without appreciable increases in their food intake. A key factor here is the persistence in allocating unmechanized agricultural activities to women, which, coupled with their other responsibilities, ensures a heavy and exhausting work burden without correspondingly greater shares of food to sustain them. The relationship between cash cropping and foodgrain shortages is often overlooked in economic planning, although the effects on family nutrition are often disastrous. Cash crops may bring more money to husbands, but this may further reduce the status, and hence access to food, for wives and children.
There is reason to believe that women’s access to food within the family or household is below desired levels and significantly less than men’s, and that while women’s energy intake is below their expenditure levels, men from the same poor families have intakes equal to or exceeding their expenditure levels. This is particularly inappropriate given the cumulative scientific and anecdotal evidence that the bulk of hard labour in most developing countries is performed by women. Current agricultural development policy and labour policy must be redirected if the vicious circle of commercialization of food crops, displacement of traditional forms of labour, additional burdening of women, and reduced access to food, is to be broken.

Summary of the work of:
Men's contribution to family nutrition in Tanzania

Over the last two decades, Tanzanian men's involvement in agriculture has increased, largely due to the disappearance of game but also as a result of an income-driven shift from millet to maize cultivation. Surveys undertaken in Tanzania during three different agricultural periods in 1987 showed that although cultivation is considered a joint activity, men and women have different and unevenly divided responsibilities. The main work burden falls on women.

A survey was carried out in a subsistence farming area of Tanzania, where most households produce sufficient food for a balanced, nutritious diet. Its purpose was to examine the critical issues of how much work is done by men and how this compares to women's contribution to family nutrition. The main finding was that women supplied a little more than half the calories consumed by the household, while men contributed just under half.

Both men and women view men as managers of the farm, and husbands usually take the final decisions. Tasks such as weeding are women's work; if a man contributes, it is in the spirit of helping his wife rather than performing a job linked to his own farming activities. Although cultural norms dictate that a woman cannot stay home while her husband goes to the fields, a man who works longer in the fields than his wife will be teased by other villagers. Women therefore cannot choose the times most convenient to them for agricultural work, despite their obligation to juggle multiple roles and complete many more tasks than men. In Tanzanian society, men do not risk social condemnation even if their work input is minimal. Male reluctance to be associated with women's work is reflected in the following conversation, recorded during the survey: "You know, my wife, I am just helping you with this job [weeding]. It is not my work. I can choose whenever I want to go back and you should not complain. I have already helped enough." His wife disagreed, asking "Are you not eating this food?" After a further hour's weeding, the husband announced: "You will not force me to work. I am going back home." And off he went, while his wife continued weeding.

Different gender, different priorities

Many gender conflicts arise from differing priorities. Men may want to cultivate more land to earn more cash, although women feel they have no time or energy for more farming. Other common conflicts concern men's desire to sell more of the crop than women consider rational for household food security. Men, the study
reports, spend large sums of money each week on beer, leaving insufficient for items such as fertilizer. Women point out that if this money is spent in this way, the family will go without. These situations require tactful negotiation by women, and can generate considerable mental stress. As the sale of cash crops and surplus produce is handled by men, who usually keep the money and have the final say in spending it, women are further disadvantaged in not knowing how much money their husbands have.

An analysis of time use by gender showed that while neither men nor women worked in the fields each day, women did so more regularly than men. Women on average spent almost triple the amount of time on all activities performed (domestic and agricultural). Even when only agricultural work was taken into consideration, women still worked longer hours than men. An inverse relationship was documented between women's and men's rates of work, showing that the more women worked, the less men did. Those households in which both made a contribution showed the best results in terms of child nutrition, and suffered least during seasonal food shortages.

Observations during meal-times showed that men normally received the lion's share of food. On the rare occasions when meals include meat, men exceptionally become the servers and are responsible for the distribution of meat among family members. As household heads, men are entitled to have the best choice at meals, and more than their fair share when food is short. Furthermore, prestigious foods such as meat and eggs are often consumed by men outside the home, in coffee shops and beer bars, thus draining household resources.

Men's agricultural contribution is not a dominant factor in family nutritional status in this community, and men represent a significantly underutilized labour force. Paradoxically, hard-working husbands generated more work for their wives, as the more they accomplished in the fields, the greater women's obligations became. The resulting greater energy output of women, combined with their lack of control over cash resources, is likely to nullify these additional efforts and prevent improvements in family nutrition. As both high and low levels of effort by husbands are therefore unproductive, long-term changes in the gender division of labour appear to offer the best chances of resolving the problems.

Summary of the work of:
Food intake and work allocation of farmers

Few detailed measurements of human energy balance and time allocation have been made in the developing world, and there are many methodological difficulties in undertaking them. People may vary in how energetically they perform the same task, and even if everyone performs all tasks in a similar manner, the application of average energy costs to individuals will fail to account for differences in metabolic efficiency. There is a need for better methodology, longer study periods, and improved understanding of the regulation of energy balance and the social and physiological mechanisms for adapting to low energy intake. Although the study below examined only 16 people, their situation is identical to that of most rural communities in developing countries and similar findings can be anticipated elsewhere.

To add to existing knowledge, a study of eight non-pregnant, non-lactating female and eight male Hindu village farmers between the ages of 25 and 40 was undertaken, over a period of 32 days of observation.

Each activity studied was categorized as either productive work, free time, or body maintenance. Journeys to and from the fields, all labour in the fields, housework, child minding, fetching water and tending of cattle, were defined as work, and social and religious activities as free time. Body maintenance included sleeping, eating, grooming, bathing and defecating.

The mean daily energy intakes (2350 kcal for men and 1852 kcal for women) represented 84% of Indian energy intake recommendations. The average energy intake per unit mass was the same. However, women were more active than men and expended a greater amount of energy.

Results showed that women dedicated 46.2% of their time (11.1 hours per day) to economically productive work activity, compared with an average for men of 33.9% (8.1 hours per day). Including housework, women spent on average 77.6 hours working per week, compared to 57 hours per week for men. This difference was found to be highly statistically significant. There was little difference between men and women regarding time spent in body maintenance and sleeping. However, the number of leisure hours diverged sharply: men had 27.8% or 6.7 hours of their day free, while women had only 14.7% or 3.5 hours leisure. It was clear that women allocated more of their time to economic activity and less to rest and social activity than did men, although the men's own perception was that they worked extremely
Women worked longer hours at moderate levels of intensity. Men did perform slightly heavier work than women, but only for an average of 14.5 minutes per day. Conversely, men spent more time doing light work than women. The women's tasks included 34.5 minutes per day carrying water, of which the uphill return journey fell into the category of heavy work. Both men and women expended high levels of energy during peak agricultural periods, but men were able to rest more than women during the remainder of the year.

The mean daily energy intake for all men was 2350 kcal and the average output was 2285 kcal. For all women, the daily mean energy expenditure of 1968 kcal appeared to exceed the mean energy intake of 1852 kcal. This imbalance may result from the use of male values to calculate the average energy cost per kilogram for each task. The lower-intake females may, in fact, have been able to perform many work tasks at lower than average estimated energy costs.

**Energy intake versus work output: Is there a connection?**

In sum, this study of the food intake and work output of poor people living in an unhealthy and hostile environment found that men ate more (average 498 kcal daily) but spent less time on productive work than women. However, for poor individuals forced to devote a high proportion of their time to work, energy intake may bear little relation to work output. Women in developing countries, whose energy intakes are about 30% lower than males, generally allocate about 30% more of their time to productive economic work. There is no reason to assume that human energy intake is necessarily related to economically productive work output if low-intake groups consistently devote more of their time to work. The economic implications of this social process are vast, and very poorly understood.

The lack of strong correlation between daily intake and output implies a time-lag in adjusting to a series of temporary imbalances. Input and output are only occasionally in phase on a given day. The finding that the standard error for average energy intake was much higher than the standard error for mean energy expenditure has been noted in other studies. This is because patterns of daily activity tend to be more consistent and less variable than food intake. Also, methods of measuring intake and output are different in potential for error. The type, source and variety of food eaten were similar for all villagers, and the energy content of a given food source varied little. However, inter-individual variability in metabolic efficiency is quite high. Thus, using average energy costs to calculate output for an individual may be inexact. This methodological problem is common to all field investigations of energy balance.

However, these energy leads and lags cannot readily explain the lack of close agreement between the women's intakes and outputs, and the lack of energy balance.
for all women deserves comment. Clearly, significant levels of variation and adaptability do exist. Social and physiological processes, including restriction of discretionary activity, increase in time allocated to economic activity, growth retardation, and changes in the metabolic efficiency of energy conversion, are mechanisms which enable individuals on a low plane of nutrition, especially poor women, to maintain a high level of economic productivity even under conditions of dire poverty.

Acquiring further understanding of the physiological mechanisms which enable undernourished women to maintain high levels of productivity is scientifically useful, but the task of solving the problem of women's excessive workload lies outside this domain. The health and development sectors need to focus on the long-term consequences for women and their infants of this extended labour, along with policy efforts to achieve a more equitable division of labour among household members.

Summary of the work of:
Seasonal energy stress in marginally nourished women

This study compared energy stress in three groups of rural women from India, Benin, and Ethiopia, paying particular attention to their weight loss and metabolic changes during the "hungry" season. The results highlight the diverse combination of mechanisms elicited by exposure to seasonal energy deficits: both the body weight and the Basal Metabolic Rate (BMR) of the Ethiopian women dropped, whereas the Beninese women mobilised only their body energy stores, and the Indian women only their BMR. This diversity of response is thought to be linked to the varying nutritional status of the three groups of women. While the Beninese women had a normal body mass index (BMI), both the Indian and Ethiopian women's BMI was lower and many would be classifiable as Chronic Energy Deficient. Weight loss in high BMI persons involves loss of body fat, whereas losses in low BMI persons entail increasingly large proportions of fat-free mass (lean tissue) as the proportion of body fat decreases. The finding that the energy deficit was almost completely accounted for by combinations of weight loss and changes in BMR raises questions about the role of physical activity.

<table>
<thead>
<tr>
<th>Country</th>
<th>Height (cm)</th>
<th>BMI</th>
<th>Energy Demand (kcal/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>149</td>
<td>18.1</td>
<td>50</td>
</tr>
<tr>
<td>Benin</td>
<td>154</td>
<td>19.2</td>
<td>45</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>154</td>
<td>19.2</td>
<td>45</td>
</tr>
</tbody>
</table>

The differences in food intake between the harvest season and the season of plenty and the lean season were small in all groups, but the differences between groups were much larger (see table). The Indian women (height 149 cm; BMI 18.1; energy demand 50 kcal/kg) and the Ethiopian women (height 154 cm; BMI 19.2; energy demand 45 kcal/kg) appeared to require noticeably more energy than the Beninese women, although the latter were larger in frame (height 157 cm; BMI 20.2; energy demand 33 kcal/kg). The Beninese women appeared able to sustain a productive way of life and maintain a reasonable proportion of body fat during both seasons, at levels of energy intake that barely reach 60-65% of that needed by the Indians and Ethiopians. This suggests that energy requirements vary considerably in these three rural regions, undoubtedly reflecting profoundly different patterns of life and work.

The seasonal trend in energy intakes revealed a consistent, although not remarkable (6-8%) decline in intake during the lean season. The cumulative "energy debts" (the value ascribed to the difference between the highest and the lowest daily calorie intake calculated over a given period) of the three groups are shown in the table, which demonstrates that each group was exposed to a seasonal episode of nutritional stress, but to a varying degree. The energy debt of the Ethiopian women was the most severe at 16,380 calories. The Indians and Beninese incurred virtually identical energy debts of about 6300 and 6180 kcal respectively. Exposure to such nutritional stress may be expected to produce a measurable effect on body weight and may
therefore represent a sufficient biological stimulus to trigger adaptive responses.

The seasonal body weight losses are shown in the table. The diversity of response is striking: the Indian women with the lowest BMI of all three groups showed virtually no weight loss (0.3 kg) whereas the Beninese and Ethiopian women lost three and five times as much respectively. Of the three groups, only the Beninese women, who had the highest BMI, were capable of entirely meeting their energy debt through this mechanism. As the weight loss among the low-BMI Indian women was small, and the energy deficit among the Ethiopian women large, these two groups could only partially balance their energy debt up to 33% in the Indians and up to 68% in the Ethiopians. This suggests that the Indian and Ethiopian women must have resorted to additional strategies in order to meet their energy deficit.

Changes in Basic Metabolic Rate (BMR)

Profound differences were revealed in the Basal Metabolic Rate (BMR) of the three groups. The Indian women had BMR values barely 65% of those of the Beninese and Ethiopian women. Low BMRs have been reported repeatedly in Indians and other oriental populations. There is as yet no plausible explanation for this phenomenon, although its implications are important as an Indian woman would have about one-third more net energy to use for physical work than either Beninese or Ethiopian women subsisting on identical energy intakes. The observed seasonal changes in BMR are consistent with the hypothesis that reduction in BMR, a well-recognized response to energy deficit, might have played a substantial role in the energy-saving processes of these women. The drop in BMR, integrated over time as previously described for energy intakes, saved 1935 kcal in the Indian and 8280 kcal in the Ethiopian women. Energy removed from the body stores (weight loss) plus the energy saved by decreasing the BMR, approximately balances all potential energy debts. A proportion of the debt remains unexplained in the Indian women (36%) and the Ethiopian women (19%), but as the calculation is crude and the figures small, no significance can be attached to this. No changes in BMR were recorded in Benin, suggesting an absence of any adaptive response.

It is important to examine to what extent physical activity contributes to limiting body weight fluctuations and to re-establishment of energy equilibrium under real life situations. This three-country study, contrary to others on seasonal variation of energy expenditure, produced evidence of tremendous stability in the energy expenditure of the Ethiopian women throughout the seasons, despite their exposure to moderately intense energy stress. Other rural communities in developing countries have also been reported as maintaining a fairly stable level of energy expenditure over the year. This lack of seasonal variation could reflect a combination of environmental and social circumstances which on one hand stretch the agricultural calendar over longer periods, thereby reducing the occurrence of short bursts of intense labour demands, and on the other cause women to maintain a uniform level of physical labour throughout the year, regardless of their state of
energy equilibrium.

**Biological or socioeconomic adaptations?**

Central to our understanding of the role played by behavioural adjustments in the adaptive response to energy deficiency is the ability to discriminate between the physiologically-driven, nutrition-dependent modifications of physical activity, and the changes in activity imposed by external, mainly economic, constraints. The unravelling of these two processes poses enormous difficulties which this study was not designed to address. However, there is evidence to suggest that decreases in physical activity may play a lesser role than originally anticipated under the conditions prevailing in rural areas of developing countries.

Firstly, energy expenditure remained practically unchanged throughout the seasons in the Ethiopian women, whose energy deficit was the most severe, and whose changes in BMR and body weight appear to have been sufficient to meet the potential energy debt. This strongly suggests that in the circumstances of this study, little scope remained for any further energy-saving through curtailing physical activity. This was also true for the Beninese and Indian women.

Secondly, physical activity, and therefore total energy expenditure, may well prove to be strictly regulated by social obligations and environmental constraints. The pre-harvest decline of physical activity may not therefore necessarily always be an expression of biological adaptation to energy deficiency, but a coincidence of low food availability with reduced agricultural workload. On the other hand, lower seasonal energy expenditure may also be explained by the practical difficulties faced by the rural poor. In Ethiopia, for example, it was observed that the amount of time spent in productive work was affected by economic status. The poorest households recorded only seven hours of productive work per day compared to almost twice that number for richer ones. Did these poor households work less because they were semi-starved, or simply because their lack of land, tools, technical input and knowhow, and other essentials, reduced them to relative inactivity? These questions remain unanswered.

The study therefore concludes that the link between activity and energy equilibrium proceeds unidirectionally from poverty to inactivity through lack of job opportunities and from inactivity to food deprivation, and from there to loss of body weight. There is no evidence that this link operates in the other direction. The overall conclusion is that in populations exposed to seasonal fluctuations of food availability, BMR and body weight changes might represent the leading forms of adaptation to energy stress and that these can be triggered
### An integrated picture of the diverse adaptive responses to seasonal energy stress by the three study groups

<table>
<thead>
<tr>
<th></th>
<th>India</th>
<th>Benin</th>
<th>Ethiopia</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Harvest</td>
<td>Lean</td>
<td>Harvest</td>
</tr>
<tr>
<td>Mean energy intake (kcal/d)</td>
<td>2030</td>
<td>1890</td>
<td>1661</td>
</tr>
<tr>
<td>Potential energy debt* (kcal)</td>
<td>630</td>
<td>0</td>
<td>618</td>
</tr>
<tr>
<td>Body weight change (kg)</td>
<td>-0.3</td>
<td>-1.0</td>
<td>-1.6</td>
</tr>
<tr>
<td>Energy equivalence of weight lost (kcal)</td>
<td>210</td>
<td>0</td>
<td>700</td>
</tr>
<tr>
<td>Mean BMR (kcal/d)</td>
<td>878</td>
<td>835</td>
<td>1335</td>
</tr>
<tr>
<td>Energy saved by BMR change* (kcal)</td>
<td>193</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Unaccounted energy debt (kcal/d)</td>
<td>-25</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

*Values are integrated over a period of 90 days for India, 120 days for Benin and 180 days for Ethiopia.
even at rather modest levels of energy deficit. No evidence was obtained that decreases in physical activity played any role in energy-saving, and the reasons for pre-harvest decrease in physical activity may in many cases be socioeconomic in origin.

This study reflects some important issues and controversies now being addressed by nutritionists. In drawing conclusions about seasonal weight variations and agricultural work patterns in women, however, the differences in men's and women's workloads and social roles should not be overlooked. Huge seasonal variations in women's workloads are uncommon, because even in the so-called "slack" agricultural season, rural women continue to be fully occupied with a wide variety of tasks and are thus likely to expend a fairly consistent amount of energy year-round, with a peak during the harvest period. In many societies, the "slack" agricultural period is a concept applicable largely to men.

Summary of the work of:

Other recent work on issues of nutrition and energy expenditure can be obtained from Dr A. Ferro-Luzzi, Instituto Nazionale della Nutrizione, Via Ardeatina 546, Roma, Italy.
Time and energy costs of distance in rural Zimbabwe

This study of 331 households was undertaken to assess the time and energy costs of distance that communities face when carrying out their daily activities in a rural area of Zimbabwe. The annual Time Cost of Distance (TCD) per trip maker in this district came to 2,837 hours, or more than four times the average national annual per capita TCD. It was also shown that the total TCD output by the household was not shared uniformly among household members. Women members carried a disproportionate share of the TCD, especially for trips related to domestic chores.

In Chiduku, the study area, the dominant economic activity is smallholder farming, although the land is rugged and only relatively small tracts are suitable for farming. The natural vegetation has become severely degraded due to overgrazing and deforestation. Forest cover is virtually depleted, leading to high time and energy costs in collecting firewood. Water is obtained mostly from streams and wells.

Estimates of the time and energy costs of distance (TCD and ECD) in this area were based on three clusters of trip generators: routine domestic chore cluster, social services cluster, and tertiary functions cluster. Inclusion of trips in the study estimates was based on two criteria: a) the reason for making the trip was a basic human requirement common to most households, and b) the trips were made on foot by members of the household, often with back or headloaded goods.

The routine domestic chores cluster absorbed the largest proportion of the household time budget, accounting for about 49% of the total household TCD output. About one-third of this effort was devoted to trips to fetch water and firewood, and to do laundry. These chores also involved head or back loads requiring higher energy consumption per kilometre walked than other chores. Distances for wood collecting trips were the greatest in the domestic chore cluster, averaging about 2 km. Livestock grazing and watering absorbed about 48% of the total TCD for domestic chores. The tertiary functions cluster contributed the second highest TCD burden at 35%. Trips to local markets were the most important category in this cluster, accounting for 56%. Trips to retail stores, grain mills and butcher shops were added to the local markets figure, to reach a total of 83%. Distances to tertiary activities are comparatively high, accounting for low trip frequency and low number of trip makers.
The social service cluster took up only 26% of the total household output. Almost two-thirds of the TCD in this cluster was taken up by children's trips to school and a further third by trips to clinics.

**Excessive time and energy costs to women**

Mothers' contribution to total TCD for 10 chores was highest at 25 hours/week, or about 38% of total household output. Daughters' contributions come next at 22%, followed by sons' at 20% and husbands' at only 13%. The TCD burden on daughters is comparatively greater, however, as their chores (fetching water and firewood, doing laundry, for example) involve carrying heavy loads.

Similarly, the Energy Cost of Distance (ECD) is also unevenly distributed among household members. Trip makers carry a much higher burden of the household ECD at 1710 calories per trip maker per day, or 80% of the average daily intake for Zimbabwe. ECD shares are differentiated by type of trip generating chore and household composition. Wives bear a disproportionate share of the ECD for domestic chores, while men are largely responsible for livestock maintenance, and make many of the trips to hospitals, traditional healers and markets. Priority attention should be given to the situation of women, who are the keys to improving health and nutrition in the household.

That mothers should spend 25 hours per week on just 10 of the many trip-generating tasks, contributing two to three times more than other family members, is cause for concern. In view of women's many other responsibilities, such as cooking, child care and crop cultivation, their share of TCDs forms a major constraint to healthy nutritional status for themselves and their families. Interventions to improve the health and nutritional standards of the rural population need to take into account not only the high time and energy costs of distance per household, but also the differential impact on women. In this case, and in most of Zimbabwe's rural households, women carry the heaviest burden of TCDs and associated ECDs by undertaking the most stressful routine domestic chore trips which involve back and head loads.

Both time and energy costs of distance are critical issues in many African rural areas. Studies of this nature make it possible to gauge the opportunity costs of the TCDs and ECDs of the basic activities of all members of the rural household, and help to set priorities when planning reductions in time and energy output. In this way age and gender biases in workburden can be demonstrated and, it is hoped, alleviated.

Summary of the work of:

Women's health in a marginal area of Kenya

Climatically, Kibwezi is dry with erratic rains. Lack of water is the most frequently expressed agricultural problem, although when rainfall is adequate, the crops provide a balanced, nutritious diet. The population of around 100,000 is highly dispersed, and accessibility to towns and markets along the main Nairobi/Mombasa road is poor.

Water consumption is constrained by distance from the source and lack of transport. On average, consumption levels double during the short rainy seasons, which might suggest that demand for water goes unmet most of the year. Water collection, the most constantly demanding domestic/agricultural task, is associated mainly with female labour; 70% of all water collection trips are made by females over 15 years of age. Women aged 20-39 make over half of all trips. An integrated survey carried out in 1983 found that 92% of women in this age-group collected water, compared to 25% of men of similar age. Children collect water at weekends, but compulsory school attendance has reduced the amount of time that they can spend assisting with this task. Men collecting water tend to do so with mechanical or animal assistance. On average, women carry 20-25 kg loads over 3.5 km, 1.5 times per day, on rough terrain and in temperatures of up to 40°C. Many are pregnant or breastfeeding.

The heavy physical labour required of women in Kibwezi, combined with high fertility and prolonged breastfeeding, creates extra nutritional demands which are difficult to meet in an area characterized by an absolute shortage of all foods. Indeed, long breastfeeding periods result from lack of weaning foods, and represent a partial transfer of nutritional deficit from children to mothers.

Nutritional stress can also be inferred from those survey findings which showed less
body fat for each age group of Kibwezi women compared to women of shorter height from more fertile land areas. One-third of the women and children had at least one parasite, most commonly hookworm. In infected women, anaemia and nutrient loss were severe.

**Chronic disability higher among women**

Average life expectancy at birth in this area is very low (47.0 years in 1979). There are few old people, and a large proportion of women are of childbearing age; in terms of total population, women aged 20–39 are more highly represented in Kibwezi than other parts of Kenya. Birth rates are therefore higher than the national average, despite male out-migration. Health status in Kibwezi is poor. Malaria, gastro-enteric infections and respiratory diseases are the most common adult ailments, while diarrhoea, measles, parasitosis and malnutrition are frequent among children. A voluntary Community Health Worker (CHW) training programme has operated since 1978. Its success has been limited, particularly in maternal and child health, probably because few women have been selected by the community for training as CHWs.

Apart from old people, the group most susceptible to chronic disability (defined as inability to perform normal duties due to sickness or weakness) consisted of women of childbearing age. From age 20, higher proportions of women than men were found to be chronically disabled. Men's disability reached similar proportions only in the over 40 age group. The nature of chronic complaints differed between adult males and females. Stomach complaints, often a euphemism for gynaecological problems, and general body pains, were associated particularly with women, whereas men appeared to be more susceptible to eye problems, chronic coughs and injuries. Chest pains accounted for 29% of all reported disability for both males and females. Many of the reported symptoms were vague, but for the Kibwezi women at least, they could be correlated with the hard physical lifestyle. One reason for the higher prevalence of functionally-defined chronic disability among women may be that the demands made on them are very high, and even a slight physical handicap can greatly impair a woman's ability to discharge all her duties successfully. Chronic disability adds to the burden on healthier women, and increases the load for all women in the community.

In sum, the majority of women in Kibwezi are undernourished with a high prevalence of intestinal parasites. Malaria, gastroenteritis and schistosomiasis are seen as major problems by the community. A heavier workload than that of other members of society imposes higher nutritional demands which are augmented by high fertility rates and long breastfeeding periods. Seasonal shortage of food is normal and famine is common. These high but unmet nutritional demands predispose women to a wide range of debilitating diseases. The resulting burden on the healthier women of the community is therefore increased.
All these problems are cumulative in nature. They could be addressed by focusing on women of childbearing age as a target population for health interventions and also by addressing some of the features that make women's lives so arduous. Assisting women farmers by extending credit and extensions services through women's groups, for example, or promoting improved carrying methods for water which may encourage men to become more involved in this task, should be attempted. Maintaining community-based grain stores could reduce seasonal food shortage and benefit women's nutritional levels. The issue of fuelwood collection, although not addressed by this paper, is also relevant here. In a semi-arid area this task will be as burdensome as water collection, and can affect nutritional levels due to the relationship between fuel availability and food intake.

<table>
<thead>
<tr>
<th>Age</th>
<th>Male % Sample</th>
<th>Male % Disabled</th>
<th>Female % Sample</th>
<th>Female % Disabled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 5</td>
<td>13.4</td>
<td>3.9</td>
<td>10.6</td>
<td>2.6</td>
</tr>
<tr>
<td>5-9</td>
<td>9.7</td>
<td>3.9</td>
<td>9.9</td>
<td>5.8</td>
</tr>
<tr>
<td>10-14</td>
<td>7.3</td>
<td>4.5</td>
<td>6.9</td>
<td>4.5</td>
</tr>
<tr>
<td>15-19</td>
<td>4.6</td>
<td>3.2</td>
<td>4.9</td>
<td>1.9</td>
</tr>
<tr>
<td>20-29</td>
<td>4.5</td>
<td>4.5</td>
<td>7.3</td>
<td>9.7</td>
</tr>
<tr>
<td>30-39</td>
<td>4.5</td>
<td>4.5</td>
<td>5.9</td>
<td>12.3</td>
</tr>
<tr>
<td>40-49</td>
<td>3.1</td>
<td>5.2</td>
<td>3.0</td>
<td>10.4</td>
</tr>
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<td>50-59</td>
<td>1.8</td>
<td>3.9</td>
<td>1.0</td>
<td>6.5</td>
</tr>
<tr>
<td>60+</td>
<td>1.0</td>
<td>7.1</td>
<td>0.6</td>
<td>5.2</td>
</tr>
</tbody>
</table>

Summary of the work of:
Chinese agrarian policy and impact on rural women

Current agrarian policy in China, coupled with the One Child per Family Policy introduced in 1979, has several negative implications for women's status and health, particularly for rural women. The benefit of past campaigns for women's equality may therefore be lost, and recognition of the economic importance of women's work greatly diminished. Male heads of household are now more likely to control both women's labour and women's income.

Agrarian policy now involves decollectivization under a "Family Responsibility System." Families must meet a production quota, but are free to dispose of any surplus as they see fit. If the quota is not met, the family must compensate the commune to which it belongs. Sideline activities and small cottage industries are encouraged, as are cultivation of family garden plots for production and sale of vegetables, and animal husbandry.

In practice, the new agricultural labour policies are reprivatizing women's labour back into the patriarchal family. Women are no longer able to earn work points through their public labour contribution, or to gain the chance to work with non-family members in agricultural tasks.

This translates into an accelerated pace of work, as rural Chinese women must now manage several different work demands, but without the aid of communal social support mechanisms which have been dismantled. Women have become the only source of assistance for the sick, elderly, disabled, young and other vulnerable groups. Elderly women find themselves dependent on their children for care and support. Thus increased economic opportunities outside the home are of no use to women who have had to assume additional domestic tasks. Rural children, especially girls, are being taken out of school to assist at home and in the fields. In short, three generations of Chinese women are negatively affected by this return to a patriarchal system.

Women pay the price for contradictory policies

Sharp contradictions emerge from the collision of state policies concerning production and reproduction. For example, the family responsibility system encourages peasant agricultural production, but the one child per family policy
prohibits the traditional rural strategy of having many children for boosting family labour power and income. As a result of the one child per family policy, some women have been subjected to forced abortions and sterilizations, or the insertion of intrauterine contraceptive devices. And it is women who are held accountable when birth quotas are exceeded. If pregnancy without official sanction occurs, prenatal care cannot be sought since the requisite authorization papers will not have been issued for presentation at local health clinics. The parents of an unauthorized child may have difficulty registering the child for grain allotments, schooling, and medical care. The effects of the One Child per Family Policy on kin networks and social structures also remain to be evaluated. For several future generations, there will be no cousins, uncles or aunts, and few siblings. This is likely to represent a considerable loss to the social fabric of Chinese society.

These problems at state level are compounded by the tendency of families to punish women who produce baby girls. Female infanticide, wifebeating, abandonment and divorce of wives who have given birth to daughters have been reported. Fears have been expressed that husbands or in-laws of sterilized women may press for divorce since remarriage offers another chance to produce sons. The One-Child Policy has created a tendency towards sterilization of daughters-in-law, with the strategy of divorce as an alternative if the first-born is a girl. The preference is for women to be sterilized in order to avoid any possible risk to more highly valued males.

Some analyses suggest that hard field labour in the family responsibility system is now being left to female members while men pursue better economic opportunities in rural transportation, manufacturing, and sideline small industries. Thus, real development opportunity for women is restricted yet further. The increased workburden and family responsibilities accruing to Chinese women as a result of current policies are a threat to their health and wellbeing, while the loss of their relative occupational autonomy represents a step backward. Unfortunately, no affirmative actions programmes for rural women have been designed, despite the well-known correlation between better work and education opportunities for women and decreased fertility.
While state intervention has decreased in one area of rural life (production), it has expanded in another (reproduction). The two are inextricably linked and cannot easily be separated in practice. Institutionally, however, they are seen as distinct spheres and are often treated as such, with serious consequences for Chinese rural women. The burdens on women who give birth to a "wrong-sex" child are clearly considerable. One potentially helpful measure might be to provide economic incentives for parents of only daughters rather than for one-child families, as presently happens. This measure would address the root of the problem, which is the low economic value and status of girls vis-à-vis boys, and assist in solving several related social problems.

Summary of the work of: