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# Work Intensity, Gender and Well-being

Cecile Jackson and Richard Palmer-Jones

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# ◆ Summary / Sommaire / Resumen


## *Summary*

Employment is central to current understandings of poverty and well-being, as well as to prescriptions for poverty reduction. Labour-intensive growth, and greater labour force participation by women, are major policy recommendations in the New Poverty Agenda of the 1990s. They are also prominent elements in the discourse on Women in Development. But gender analysts paint a complex picture of women and work. They note that women often face social and ideological constraints when seeking, obtaining and performing work outside households, with responsibilities for child bearing and rearing generating particular problems. And the objective of increasing female employment can — in the context of long working days and added household duties — contribute to what has been termed "time famine", with negative effects on women's health and well-being. Finally, it is important to analyse the specific content and character of work — and especially its physical arduousness.

**The Character of Work**

The development discourse in general, and poverty and gender debates in particular, often treat "labour" more as an abstract category than as a physical experience. This means that there is very little useful literature on work intensity, let alone on gender-specific work intensities. Yet an analysis of varying levels of energy expended in carrying out different forms of work, as this is related to individual physical strength, shows that women and men have different capacities for physical effort at different stages in their lifecycles. Both biological differences and socio-cultural norms are significant in this regard. The concept of the arduousness of labour, which is determined not only by work intensity but also by other psycho-social characteristics of work, is an essential tool for understanding levels of nutrition, health and other central components of well-being (or ill-being), including productivity.

**Work Intensity and Poverty Eradication**

A focus on the issue of work intensity raises new questions about poverty eradication programmes. In fact, many of the policies espoused by the development community, and often assumed to reduce poverty, may worsen the conditions of the poor. Several examples of how this may occur are outlined below.

*Agricultural extensification* — increasing the size of a household agricultural plot — may be essential for improving the livelihood of those with infrasubsistence holdings. But it often increases the work load of women, who are likely in many farming systems to provide the bulk of the labour required to cultivate larger areas of land. This can have a negative effect on women's well-being and, as was recently shown in Zimbabwe, can also have ill effects on child nutrition and overall household well-being.

*Effort-intensive* growth policies — routes out of poverty through labour-intensive economic growth — generally fail to take individual capabilities for work into account and may thus have negative effects on well-being. It can also be asked why, when people throughout the world attempt to improve well-being through avoiding heavy physical labour, poverty alleviation strategies do not concentrate

more systematically on generating acceptable returns for lower levels of human energy expenditure.

Uncritical support for *environment-friendly and "sustainable" technologies* should also be reviewed. Technologies which substitute human energy for fossil fuel-based production systems are often considered suitable for poor countries with abundant supplies of labour. A case in point is the use of a human-powered treadle pump, which is being promoted in Bangladesh for the irrigation of staple crops. Evidence indicates that such technologies can impose severe health risks on the weaker members of the household — women in particular — who assume the main burden of work.

*Self-targeting* through the labour test — offering employment to people at such low levels of payment that the non-poor do not compete for jobs — is another example of the lack of attention to work intensity and well-being issues in poverty alleviation strategies. Self-targeting is an important component of food-for-work programmes, but it may prove to be an "energy trap" for the poor, and especially for women who are ill-equipped to bear the physical cost of additional energy-intensive work without sufficient improvement in caloric intake or nutritional status.

Finally, since an individual engaged in arduous work needs time to recover, it seems logical that *rest* should be taken into account when discussing well-being. If economists were to treat rest as "productive consumption", they would have to revise the idea that the use of labour-saving technologies must be justified by showing the "productive" use of liberated time.

Throughout the discussion on poverty reduction, it is important to remember that women are not always disadvantaged in relation to men. Gender relations are extremely complex and culturally specific; and work capacities of women and men change during the course of a lifetime. Eradicating poverty requires understanding local situations and designing programmes that move beyond "labour markets" to the real world of work.

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## *Sommaire*

L'emploi occupe une place centrale dans les conceptions actuelles de la pauvreté et du bien-être ainsi que dans les prescriptions relatives à la réduction de la pauvreté. La croissance à forte intensité de main-d'oeuvre et une plus forte proportion de femmes sur le marché du travail font partie des politiques recommandées pour lutter contre la nouvelle pauvreté des années 90. Ce sont aussi des éléments saillants du discours relatif aux femmes et au développement.

Pourtant les analystes des rapports sociaux entre hommes et femmes brossent un tableau complexe des femmes et du travail. Ils(elles) relèvent que les femmes se heurtent souvent à des obstacles sociaux et idéologiques lorsqu'elles cherchent, obtiennent et occupent un emploi hors de leur domicile, les responsabilités liées à la maternité et à l'éducation des enfants soulevant des problèmes particuliers. L'objectif de la multiplication des emplois féminins peut aboutir — lorsque la journée de travail est longue et que s'y ajoutent les tâches ménagères — à ce que l'on a désigné comme une "famine de temps", qui ne peut que nuire à la santé et au bien-être des femmes. Il importe enfin d'analyser le contenu précis et la nature du travail, et en particulier d'examiner s'il est pénible physiquement ou non.

**La nature du travail**

Le discours du développement en général, et les débats sur la pauvreté et les rapports sociaux entre les sexes en particulier, traitent souvent le travail comme une catégorie abstraite plutôt que comme une expérience physique. Autant dire qu'il existe très peu d'ouvrages utiles portant sur l'intensité du travail, et encore moins sur une intensité du travail étudiée en fonction du sexe. Pourtant une analyse des divers niveaux d'énergie dépensée en accomplissant divers travaux, dans la mesure où cette énergie est liée à la force physique individuelle, montre que l'effort physique que peuvent fournir femmes et hommes varie selon les stades de la vie. Les différences biologiques et les normes socio-culturelles ont toutes deux leur importance à cet égard. La notion de pénibilité du travail, définie non seulement par l'intensité mais aussi par d'autres caractéristiques psycho-sociales du travail, est un outil essentiel pour comprendre les niveaux de nutrition, la santé et les autres éléments constitutifs du bien ou du mal-être, y compris la productivité.

**Intensité du travail et éradication de la pauvreté**

L'examen de la situation sous l'angle de l'intensité du travail suscite de nouvelles interrogations concernant les programmes d'éradication de la pauvreté. En fait, bien des politiques adoptées par les milieux du développement et souvent censées réduire la pauvreté peuvent aggraver la condition des pauvres.
En voici quelques exemples:

*L'extension des terres agricoles* — plus de terres à cultiver pour le ménage — peut être indispensable à l'amélioration des moyens d'existence des ménages qui ont trop peu de terres pour en vivre. Mais elle augmente souvent la charge de travail des femmes qui, dans bien des systèmes agricoles, fournissent l'essentiel du travail nécessaire à l'exploitation d'une plus grande parcelle. Cela peut avoir des effets néfastes sur le bien-être des femmes et, comme on l'a vu récemment au Zimbabwe, sur la nutrition des enfants et le bien-être de l'ensemble du ménage.

Les politiques de croissance reposant sur *l'intensité de l'effort* — une croissance économique à forte intensité de main-d'oeuvre pour vaincre la pauvreté — ne tiennent généralement pas compte des capacités de travail individuelles et peuvent donc avoir des effets fâcheux sur le bien-être. On peut aussi se demander pourquoi alors que dans le monde entier on s'efforce d'éviter les rudes travaux physiques dans la recherche du bien-être, les stratégies d'atténuation de la pauvreté ne s'attachent pas plus systématiquement à améliorer le rendement humain pour qu'il soit acceptable pour des dépenses d'énergie inférieures.

Il faudrait aussi réexaminer les techniques *propres* et "*durables*", qui suscitent aujourd'hui une adhésion inconditionnelle. Les techniques qui substituent

l'énergie humaine à des systèmes de production alimentés par des combustibles fossiles sont souvent considérées bonnes pour les pays pauvres où la main-d'oeuvre est abondante. L'utilisation de la pompe à pédale, recommandée au Bangladesh pour l'irrigation des principales cultures, en est un exemple. On possède aujourd'hui des éléments tendant à prouver que de telles techniques peuvent menacer sérieusement la santé des membres les plus faibles du ménage, des femmes en particulier, qui fournissent l'essentiel du travail.

La formule qui consiste à laisser les pauvres *se désigner eux-mêmes comme cible* par le choix d'un travail — l'offre d'emplois assortis de salaires si bas que seuls les pauvres postuleront — illustre aussi le peu d'attention accordé aux questions d'intensité du travail et de bien-être dans les stratégies d'atténuation de la pauvreté. Cette composante importante des programmes dans lesquels le travail est rémunéré par de la nourriture peut se révéler un "piège à énergie" pour les pauvres, en particulier pour les femmes qui n'ont pas la constitution nécessaire pour supporter la dépense physique d'un travail leur demandant un supplément d'énergie si ce travail ne va pas de pair avec une amélioration suffisante de l'apport calorique ou de l'état nutritionnel.

Enfin, comme toute personne se livrant à un travail pénible a besoin de temps pour récupérer, il semble logique de prendre le repos en considération lorsqu'il est question de bien-être. Si les économistes traitaient le repos comme une "consommation productive", ils devraient réviser l'idée selon laquelle il faut justifier l'emploi de techniques épargnant la main-d'oeuvre par un usage "productif" du temps libéré.

Tout au long du débat sur la réduction de la pauvreté, il importe de se souvenir que les femmes ne sont pas toujours défavorisées par rapport aux hommes. Les rapports sociaux entre hommes et femmes sont extrêmement complexes et propres à chaque culture et les capacités de travail des femmes et des hommes changent au cours d'une vie. Pour éradiquer la pauvreté, il faut comprendre les situations locales et concevoir des programmes sachant dépasser les "marchés du travail" pour tenir compte du monde réel du travail.[*]

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[*] Traduit de l'anglais par Martine Cullot.

## *Resumen*

En la actualidad, el empleo es un factor fundamental para entender tanto la pobreza como el bienestar, así como para diseñar estrategias para reducir la pobreza. El crecimiento sustentado en el uso intensivo de mano de obra, así como una mayor participación de las mujeres en la fuerza de trabajo, constituyen las recomendaciones principales de política en la Nueva Agenda sobre Pobreza para el decenio de los 90. Son también elementos que sobresalen en el discurso acerca de Las mujeres en el desarrollo. Pero los analistas de la distinción por género ofrecen una imagen compleja de las mujeres y su relación con el trabajo. Advierten que cuando las mujeres tratan de obtener trabajo y cumplir con él fuera del hogar, frecuentemente se enfrentan a restricciones sociales e ideológicas ya que su responsabilidad para criar y atender a sus hijos les genera problemas especiales. En el contexto de largas jornadas de trabajo y tareas domésticas adicionales, el objetivo de aumentar el empleo femenino puede contribuir a generar lo que se ha denominado "hambre de tiempo", con efectos negativos para la salud y el bienestar de las mujeres. Por último, es importante analizar la índole del trabajo y sus características específicas, y sobre todo lo arduo que pueda ser en términos de agotamiento físico.

**La índole del trabajo**

En general, en el discurso sobre desarrollo y, particularmente en los debates sobre pobreza y distinción por género, a menudo se considera el "trabajo" más como una categoría abstracta que como una experiencia física. Esto significa que hay muy pocas obras sobre la intensidad del trabajo que sean útiles, y mucho menos que se refieran específicamente a la intensidad del trabajo femenino. Sin embargo, un análisis de la relación entre la fuerza física individual y los diversos niveles de desgaste de energía humana cuando se realizan distintos tipos de trabajo, muestra que mujeres y hombres difieren en su capacidad para realizar esfuerzos físicos según las diversas etapas de su vida. Tanto las diferencias biológicas como las normas socioculturales son significativas al respecto. El concepto de rigurosidad del trabajo, que no sólo está determinado por la intensidad de la faena sino también por otras características psicosociales del trabajo, es una herramienta esencial para entender los niveles de nutrición, de salud y de otros componentes fundamentales del bienestar (o del malestar), incluida la productividad.

**Intensidad del trabajo y erradicación de la pobreza**

Al dirigir la atención hacia el problema de la intensidad del trabajo se suscitan preguntas nuevas sobre los programas de erradicación de pobreza. En realidad, muchas de las políticas aprobadas por la comunidad promotora del desarrollo y que a menudo se supone que reducen la pobreza, pueden empeorar las condiciones de vida de los pobres. A continuación se delinean algunos ejemplos de lo que puede suceder.

*Ampliación del predio agrícola:* Aumentar el tamaño de la parcela agrícola familiar puede ser fundamental para mejorar los medios de vida de los campesinos con predios de infrasubsistencia. Pero ello aumenta a menudo la carga de trabajo de las mujeres, quienes en muchos sistemas de cultivo aportan la mayor parte de la fuerza de trabajo requerida para cultivar extensiones más grandes de tierras. Esto puede tener un efecto negativo sobre el bienestar de las mujeres y, como se demostró recientemente en el caso de Zimbabwe, también puede tener efectos negativos en el nivel de nutrición de los niños y en el bienestar general de los miembros de la unidad doméstica.

Las políticas de crecimiento sustentadas en el *empleo intensivo de mano de obra*, por lo general, no logran tomar en consideración la capacidad individual de trabajo y, por lo tanto, pueden tener efectos negativos en el bienestar. Cabe preguntar también por qué, cuando en todo el mundo la gente trata de mejorar su bienestar evitando el trabajo físico agotador, las estrategias para reducir la pobreza no se concentran más sistemáticamente en la generación de ingresos aceptables, que correspondan a niveles más bajos de desgaste de energía humana.

Debería revisarse también el apoyo irrestricto a las *tecnologías "sustentables"*, que se supone son *"favorables" al medio ambiente*. Con frecuencia se considera que las tecnologías que substituyen sistemas de producción sustentados en el consumo de combustibles fósiles por los que se sustentan en el consumo de energía humana son adecuadas para los países pobres con oferta abundante de mano de obra. Un caso ilustrativo es el que se refiere a Bangladesh, donde se ha promovido la aplicación de un sistema de bombeo a base de pedales para regar los cultivos básicos. La evidencia indica que ese tipo de tecnologías puede imponer riesgos graves a la salud de los miembros más débiles del hogar (las mujeres especialmente) sobre quienes recae la mayor carga de trabajo.

Otro ejemplo de la falta de atención a los temas de la intensidad del trabajo y del bienestar, que caracteriza las estrategias para reducir la pobreza es el procedimiento denominado *autoidentificación de los pobres*. Este último consiste en obligar a las personas más pobres a que se hagan presentes y para ello se les ofrece empleo reduciendo los salarios a niveles tan bajos que sólo los que se hallan en condiciones paupérrimas los aceptan. La "autoidentificación" de los más pobres es un componente importante de los programas de intercambio de trabajo por alimentos, pero puede constituir también una "trampa energética" para los pobres, y especialmente para las mujeres que no están bien equipadas para soportar el costo físico del trabajo adicional agobiador, sin un mejoramiento suficiente en la ingesta de calorías o en su condición nutricional.

Finalmente, puesto que un individuo dedicado al trabajo agobiante necesita tiempo para recuperarse, parece lógico que debería tomarse en consideración el tema del *descanso* cuando se analiza el bienestar. Si los economistas trataran el descanso como "uso productivo del tiempo", tendrían que cambiar su idea de que para justificar el uso de tecnologías ahorradoras de mano de obra es necesario comprobar que esa mano de obra liberada se ocupe de manera productiva.

En el debate sobre la reducción de la pobreza, es importante recordar que no siempre las mujeres se hallan en desventaja en relación con los hombres. Las relaciones de género son sumamente complejas y están condicionadas culturalmente; además la capacidad de trabajo de mujeres y hombres cambia en el transcurso de sus vidas. Para erradicar la pobreza se requiere entender las situaciones locales y diseñar programas que vayan más allá de los "mercados laborales" y penetren en la realidad del ámbito de trabajo.[*]

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[*] Traducido del inglés por Sergio Alcántara.

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## ◆ Abbreviations and Acronyms

| | |
|---|---|
| AP | human energy input |
| BMI | Body Mass Index |
| BMR | Basal Metabolic Rate |
| CED | Chronic Energy Deficiency |
| EE | energy expenditure |
| EI | energy appropriated from the environment |
| EMG | electromyographic |
| FAO | Food and Agriculture Organization of the United Nations |
| GAD | gender and development |
| HLBS | human labour-based society |
| HRmax | maximum heart rate |
| IDECG | International Dietary Energy Consultancy Group |
| IFPRI | International Food Policy Research Institute |
| NPA | New Poverty Agenda |
| PAL | Physical Activity Level |
| PAR | Physical Activity Ratio |
| PWC | physical work capacity |
| TEE | Total Energy Expenditure |
| UNIFEM | United Nations Development Fund for Women |
| UNU | United Nations University |
| $VO_2$max | maximum volume of oxygen |
| WHO | World Health Organization |
| WID | women in development |

# 1. INTRODUCTION

Work is central to current understandings of poverty, and well-being more generally, as well as to prescriptions for poverty reduction. While poverty has traditionally been assessed in terms of household income or command over commodities, more recently we have come to assess it at the individual level, and in terms of the capabilities that individuals possess (Sen, 1983). This change in approach has come about in part as a response to the critiques of gender analysts, which showed the existence of unequal intra-household ill-being. The capabilities approach suggests the need to trace the links from an individual's endowments of personal, private, communal and public (and open access) resources and assets, the appropriation, production, exchange and transfer systems of their society (including intra-household as well as social allocation processes), to their command over commodities, consumption and "decision making" which transform "entitlements" into bodily well-being. Within the entitlements and capabilities approach, it is labour entitlements which are especially crucial to the well-being of the majority of the poor in developing countries, since the poor generally lack other endowments.[1] But the gendered differences in access to employment and in divisions of labour in labour markets and within households, and gender inequalities in endowments, force a recognition of the gendered ways that work relates to well-being, and the crucial roles of intra-household processes of allocation in the determination of well-being.

The entitlements and capabilities approach gives prominence to individuals' physical ability to work (endowment), their access to work and its benefits (entitlement), and the availability of work opportunities through which to exercise those capabilities. The gender application of the model suggests that women as well as men require healthy, well-nourished bodies (and minds), the absence of social constraints which deny or limit the right to work, and plentiful opportunities for employment. Thus both New Poverty Agenda (NPA) and Women in Development (WID) policy prescriptions emphasize labour-intensive growth, and greater participation by women in employment (World Bank, 1990; UNDP, 1995). Gender and development (GAD) analysts have, however, raised a number of issues related to the work and well-being connection by identifying ways in which gender is a distinctive form of social differentiation not easily accommodated in a gender-unspecified concept of "poor people" — for example, when poor women are seen as just like poor men, only rather poorer (Jackson, 1996; Kabeer, 1997). It has been argued that women's work within households is frequently invisible and devalued; that women often face ideological constraints in seeking, getting and performing work outside of households; that gender divisions of labour create obstacles — practical and cultural — to work opportunities; and that biological reproduction generates a range of lifecycle effects and constraints experienced by women. These all have important implications for the NPA, as does the insight that the objective of increasing employment for poor women, in the context of the long working days of poor women, or what has been termed "time-famine", can produce perverse effects on their well-being. This paper suggests that further

[1] Those among the poor who lack labour endowments — the sick, old, very young, disabled — should not be forgotten. Although the borders of these categories may not be clearly identifiable, there will always be a need for transfers that are not related to labour-based entitlements.

gender refinement of capability approaches would be obtained by a more careful attention to the quality and embodied experience of work, especially its physical arduousness.[2] As a result, we might reach a fuller understanding of how work and well-being are connected in gendered ways.

We do not believe that the burdensomeness of work is a function only of its physical arduousness; it is surely also related to the social relations and valuation of work, and personal experiences of the pleasures and pains of work. But among nutritionally challenged populations, we believe, the physical aspect is of great importance and, in the discourses with which we are concerned, has not been well understood. A further justification for our emphasis on physical arduousness is the continuing context of absolute poverty in populations heavily dependent on physically arduous activity, in both agricultural and natural resource-based livelihoods, and in urban areas where the continuing prevalence of physically laborious livelihoods (rickshaw pullers in eastern India, for example) testifies to the poverty of these populations. There is also a broader question, raised in the paper, about the extraordinary endurance of gender divisions of labour in households and societies that appear to disadvantage women, a persistence which deserves reflection in the light of concepts of women as active agents with some ability to shape their own lives.[3]

The ways in which development discourses in general, and poverty and gender debates in particular, have approached work are marked by particular Western histories and preoccupations (Jackson, 1997). One consequence of this is the absence of attention to labour as more than an abstract category; to labour as physical experience. As a result, there is remarkably little directly useful literature available on work intensity, let alone on gender-disaggregated work intensities. While historians of technical change have considered work intensity and fatigue (Rabinbach, 1990), their focus is on industrial contexts. Gender analysts of social change, after an early interest in sexual dimorphism as a determinant of sexual divisions of labour, quickly decided that male strength was a mystification, and that gender divisions of labour were more directly the consequence of the constraints of reproduction on women (Mukhopadhyay and Higgins, 1988). In arguing here that both production and reproduction are significant, and connected in the concept of embodiment, we try to draw together relevant strands across a range of disciplines and sub-disciplines towards some inevitably tentative conclusions and ideas for policy and research. In the paper we first locate our interest in work intensity as an important but neglected quality of labour. We critically review the ways in which work intensity is dealt with, implicitly or explicitly, in mainstream nutrition science, biological/ecological anthropology, and economics, and summarize the implications of these approaches for gendered well-being. We then argue that work intensity has significant gendered effects on well-being, that it is central to the embodied and gendered subjectivities of men and women, and that it therefore is relevant to intra-household "bargaining" and the

[2] We use various words to express what we have in mind here, including "work intensity" and "burdensomeness". The paucity of research on work intensity has required us to assemble material from a range of socio-cultural and economic contexts, mostly in South Asia. While we expect regional and contextual variations to be significant, we also hope that our basic arguments are convincing.

[3] The term "agency" is used in a number of different ways in different discourses, but here we use it simply to indicate the indeterminate nature of human actions, and the capacity of men and women for willed and voluntary action which is not given by social structures.

gender divisions of labour which emerge from it. We briefly indicate useful concepts for thinking about embodiment and well-being, and, finally, we speculate on the possible implications of closer attention to work intensity for gender equity and poverty reduction interventions, as well as research.

# 2. NUTRITION, PHYSIOLOGY, ERGONOMICS AND WORK INTENSITY

We begin with an account of the direct connections of work intensity and well-being as they affect the physical health of individual women and men. Here we are interested in how different levels of work intensity — defined here not as multi-tasking (Floro, 1995), but as energy intensity — lead to different bodily states of health, morbidity or vulnerability and how these states are distributed between women and men. This may appear to be a simple question, but it is one which finds only partial answers in mainstream nutrition science and ergonomics.

First, it must be said that comparing the bodily well-being of women and men is problematic because their physiologies differ, as do their subjective perceptions of what constitutes well-being and what it is legitimate to consider ill-being. Thus in the United Kingdom, women experience illness more frequently than men, judged by attendance at general practitioners' surgeries, yet they live longer than men (Whitehead, 1988).[4] Women also attempt suicide more frequently than men, but far more men than women die by suicide. Indicators of states of health and well-being are a complex mixture of physiological advantage and disadvantage in the face of disease and nutrition stresses, and socio-cultural (and personal) advantage and disadvantage in the ability of gendered subjects to achieve and sustain well-being. The boundaries of the physical and the cultural are by no means clear, and are deeply contested. For the purposes of this discussion, however, we consider that there *is* a need to know about "objective" well-being (Sen, 1987). Moreover, we take a realist approach to the body: one in which the body is both a discursive construct and a broadly defined set of biological constraints and opportunities (Soper, 1995).

While the links between nutrition and productivity have been of long-standing interest in development studies, the questions around nutrition and well-being require a wider analysis — for example, of how physique is connected to reproductive success and social mobility (Strickland et al., 1997) — which we can only selectively, and speculatively, given the state of knowledge, address in the space available. Nonetheless, we do hope to show that work intensity is an important factor in the gendered understanding of well-being and its determinants, and how this might affect development interventions and research.

[4] A similar phenomenon occurs in Kerala (Ramachandran, 1996).

## ◆ The Nutrition Model

Conventional nutrition models (WHO/FAO/UNU, 1985) consider balance between energy consumption and expenditure a requirement of bodily well-being, expressed in stable body weight among adults, and growth in height in proportion to age for children.[5] Continuing gain or loss in weight is clearly not sustainable. Calorie intake (energy consumption)[6] alone is an inadequate account of nutritional status since food needs are relative to individuals' sex, age, body size and activity level.[7] Furthermore, there is considerable variability even among individuals of the same height, weight, sex and activity level.[8] An equitable division of food resources between women and men in a household is related to the sizes and work patterns of individuals and their personal characteristics. Body Mass Index (BMI), Physical Activity Ratio (PAR) and Physical Activity Level (PAL) are key concepts in the nutrition model, and we briefly explain them below, with a view to their differences for women and men.

BMI (weight, in kilograms, divided by height, in metres squared) is widely used as an indicator of nutritional status because it adjusts for stature (Shetty and James, 1994). Cut-off points in the range of BMIs have been used to define what is underweight, overweight and normal in a population.[9] BMIs have been seen officially as independent of gender (Shetty and James, 1994:19), although it is common to use different cut-off points for men and women because of their different body compositions and physiology. Shetty (1997) argues that BMI is a better indicator of nutritional status for men than for women because the functional consequences (vulnerability to ill-health and death) of low BMI appear to be more clearly defined for men. This is related to the greater percentage of fat in women's bodies at any BMI, which seems to account for their greater resistance to infection and ability to survive at low BMI (Henry, 1990). In emergencies, severe malnutrition leads to oedema, but when body fat is mobilized in women it

[5] The time period over which balance is assessed cannot be easily defined since everybody experiences day-to-day fluctuations in weight, and in some societies there are regular and predictable seasonal changes in body weight. Reproduction is also associated with weight changes, which need not be considered ill-being.

[6] Food intake must be converted into nutrients, which have nutritional effects. We focus here only on energy balance, noting that other nutrients are also important, and indeed bear on work intensity. For example, anaemia is very common among poor women and seriously affects work capability independently of Body Mass Index (BMI, explained below).

[7] While much work has attempted to relate nutritional or health status to productivity (see below), there has been less empirical investigation of the effect of work on health and nutritional status; work activity, specifically the time devoted to relatively energy intensive agricultural work, was an important determinant of the nutritional status of Ghanaian women (Higgins and Alderman, 1997)

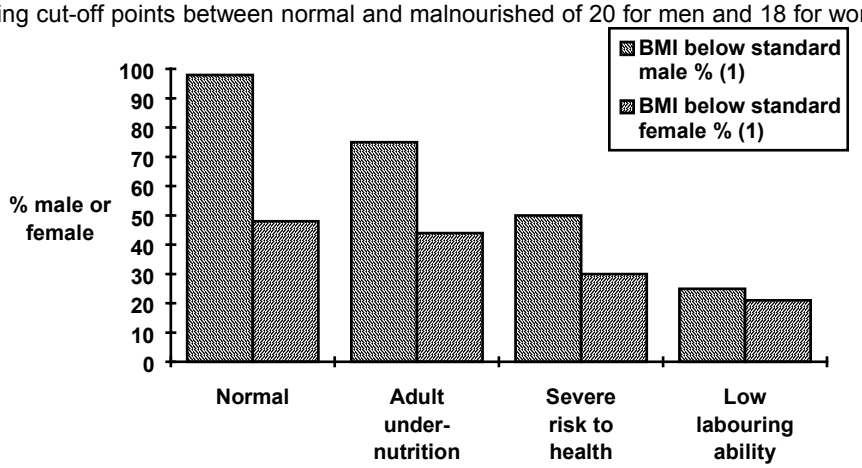
[8] We discuss briefly below the issue of intra-individual variability in nutritional functionings.

[9] The International Dietary Energy Consultancy Group (IDECG) recommended the following cut-off points to define Chronic Energy Deficiency (CED): < 16.0; 16.0-16.9; 17.0-18.5; > 18.5. If the population maintained PAL (see below) less than 1.4, these ranges defined Grade 3, Grade 2, Grade 1 CED and Normal respectively. For population PAL ≥ 1.4 the categories were Grade 3, Grade 1, Normal and Normal respectively (James et al., 1988). The apparent anomaly that the cut-off point between Normal and Grade 1 CED is higher for a more active population embodies the view that this was appropriate for populations with low energy intake and turnover, reflecting low physical activity (Shetty and James, 1994:4).

produces steroid hormones which prevent the escape of body fluid. Men thus suffer from this to a much greater extent than women. So, it is difficult to compare the nutritional status of men and women because their bodies differ in form and function. For both, however, well-being in terms of survival, production and reproduction demands adequate BMI. BMI is also a reasonably sensitive indicator of changes in energy stores, e.g. seasonally, in both men and women.

There are various other functional consequences of low BMI for women and men. For women the effects on reproduction are varied — conception ceases at low BMI, and low BMI leads to low birth weight babies, but pregnancy is largely unaffected and low BMI has no effect on lactation. The effects of low BMI on health are clear and connected to more days of illness (see Pryer, 1989, for poor urban males in Bangladesh). The effects of low BMI are gender differentiated in other ways, too; women can survive at considerably lower BMIs than men, as studies of famine mortality show.

**Figure 1**
**Percentage of males and females below low BMI thresholds, Palanpur**
(1) Using cut-off points between normal and malnourished of 20 for men and 18 for women,




as recommended by FAO/WHO/UNU.
Source: Kynch and McGuire, 1994:27.

Figure 1 shows the comparison of the BMIs of men and women in poor agricultural labour households in India, and the vulnerabilities of men (Kynch and McGuire, 1994).

Gender analysis addresses the gendered roles of both men and women, and shows here how, in this particular culture, the male gender role of "provider" entails well-being threats for men. What the rest of this study also showed is that undernourishment of girls is much greater than that of boys, such that girls grow up to be stunted (short) adults, while boys grow up less stunted but are, as adults, more wasted (thin).[10] However, in north-west India excess girl child mortality is a major social problem (Harriss and Watson, 1988; Agnihotri, 1997). Nevertheless, Kynch and McGuire provide information which suggests that the greater thinness of men and their vulnerability (in terms of ability to work for higher wages and resist illness) is socially recognized. However, while the BMI of adult women appears better than men (especially given the apparently greater vulnerability of

[10] This may not be the case everywhere in South Asia (see, for example, Walker and Ryan, 1990:272).

men at the same BMI as women) it should be remembered that this is achieved at the cost of childhood undernutrition, which may have harmed women in other ways. Both the vulnerabilities of poor working men with young families, in provider roles, and those of nutritionally deprived girls facing high mortality risks, as a consequence of son preference, are gender based.

There are also energy expenditure aspects of maintaining an adequate BMI; gender difference in measuring and interpreting energy expenditure is a complex issue, and direct measures of energy expenditure are not usually possible with free living populations. The factorial method is most common (WHO/FAO/UNU, 1985). According to this method, energy is expended in maintaining bodily functions — the Basal Metabolic Rate (BMR — and the energy cost of activity can be assessed in terms of multiples of BMR. Each activity is allocated a PAR based on direct or indirect measurements of populations in self-paced activity. The energy cost of activity during a day is calculated as the PAR of each activity during 24 hours (including sleep and rest), weighted by time spent on the activity. This gives the PAL.[11] Sleeping and resting are given PAR of around 1.1. PAL multiplied by BMR gives Total Energy Expenditure (TEE). PAL is thus the ratio of TEE to BMR.[12] PALs are then classified as light, moderate or heavy levels of activity, with different cut-off points for sex and age.[13]

BMR differs for men and women, since, although the tissues of males and females perform in the same way, the proportion of tissue which is less metabolically active (fat) is higher in women. Hence, for a man and a woman of the same stature and BMI, the BMR of women is lower. Women use less energy than men because men have a higher proportion of active tissue, and being generally smaller than men, women expend less energy in activity where body movement is involved. In the studies reviewed by Shetty (1997), PALs for individuals 18-25 years old averaged 1.85 for men and 1.70 for women.

The estimate of the energy expenditure for different forms of activity may be obtained either by using standard tables (which only exist for limited populations and activities[14]) or by measurement with oxygen consumption equipment (McNeill et al., 1987) or heart rate monitoring (Strickland and Tuffrey, 1997). These methods are time consuming, difficult and intrusive.[15] What this model tells us

[11] Some authors use PAL for activity-specific BMR multipliers. We prefer to use PAR for each activity and restrict PAL to whole day-energy expenditure estimates.

[12] TEE = PAL * BMR; hence PAL = TEE/BMR. PAL = $\Sigma(t_i.PAR_i))/\Sigma t_i$; $t_i$ is the time spent on activity i with energy expenditure assessed as a multiple of BMR, and $\Sigma t_i = 24$. Sometimes the EE of each activity is calculated separately and as $EE_i = PAR_i * t_i$, and TEE is calculated as $\Sigma EE_i$ and PAL=$\Sigma EE_i/\Sigma t_I$, and $\Sigma t_i$=24. The definitions are equivalent.

[13] Catherine Panter-Brick argues that there should not be different cut-offs by sex because what is "heavy" or "light" is culturally specific, and the FAO represent Western concepts of appropriate gender divisions of effort. She points out that in some societies women have PALs as least as high as men's (Panter-Brick, 1997). Cut-off points of BMI to determine nutritional status are also specified in terms of PAL; for a PAL greater than 1.4, a BMI of 16.0 to 16.9 is classified as Grade 2 Chronic Energy Deficiency (CED), whereas for a PAL less than 1.4 this range of BMI is classified as Grade 1 CED (James et al., 1988).

[14] These tables generally refer to Western societies.

[15] In addition to the technical problems of temperamental and unreliable equipment in difficult field conditions, there are sampling issues and problems of defining the pace of work (see below). It also makes a great deal of difference whether measurement is done at

about work intensity and gender is that men, through having a higher proportion of active tissue, have a greater BMR and tend, in general, to a slightly higher PAL than women for the same level of activity.

What PALs are found in poor Third World societies? A study of energy expenditure in a south Indian community used standard tables on the energy costs of activities combined with sample-based time allocation information to estimate the energy expenditures of men and women. This showed that the average male PAL across four socio-economic groups was 1.96; the corresponding female PAL was 1.69 (Gillespie and McNeill, 1992:73). These results are very dependent on the values given in standard tables — in this case domestic work was estimated at only 2 times the BMR, field work at 5 times the BMR for men and 4 times the BMR for women, and travel at 3.5 times the BMR for men and 3.0 times the BMR for women.[16] The ratio of male to female energy expenditure in this study was 1.45,[17] and the authors conclude that there is a "relatively clear division of heavy labour between the sexes" (1992:44). The estimates surely entail many assumptions about the nature of such activity — grain processing by hand is an extremely arduous form of domestic labour, for example, as are water and wood collection — and the results are therefore open to some question. As Gillespie and McNeill observe, "The difference between men and women in PAL values was largely due to the fact that on average the men spent 30 minutes per day more than women in field work and 80 minutes per day more than women in travel" (1992:73). Nevertheless, the authors go on to show that although men in the 20-49 age range had higher energy intake than women, they had effectively the same BMI (1992:98-9),[18] which is consistent with higher energy expenditure in work.[19]

In the limited numbers of studies in which the gender distribution of PALs is given, considerable variation in apparent patterns of work intensity emerges. In four of the nine studies of subsistence communities reviewed by Panter-Brick (1997), women had greater PALs than men — farmers in Senegal, the Gambia and Burkina Faso, and agro-pastoralists in highland Bolivia — while in five — farmers in Peru, India and highland Ecuador, foragers in Paraguay, and agro-pastoralists in Nepal — the situation was reversed. Research by Strickland et al. in Nepal (1997:4) suggests that the time spent on "heavy" work (defined as over 35 per cent of the maximum volume of oxygen (or $VO_2$max, see below), on days when those

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the start or middle of work, whether switches from aerobic to anaerobic energy metabolism occur, and whether the activity is habitual or not.

[16] This point warrants a brief digression. The data for BMRs of populations and PARs of activities are based on samples drawn mainly from Western populations, and there are questions of whether they can be extrapolated to other populations and circumstances. This is a somewhat contentious issue, but we believe our account is a balanced use of the evidence that is presently available.

[17] This compares to values of 1.14 in highland New Guinea, 1.28 in coastal New Guinea, 1.14 for Sahelian farmers and 1.66 for Machiguenga Indians (see Gillespie and McNeill, 1992:74 for details).

[18] Gillespie and McNeill conclude that "the sexual division of labour is an effective population adaptation to under-nutrition, with men having low body weight and carrying out heavy tasks while women's fat reserves are protected to permit them to survive the energy stresses of the reproductive period" (1992:103).

[19] We recognize that the empirical studies on which these arguments are based are few and drawn from very disparate situations. Apart from the appropriate caution, what is relevant is that there is at least some support for our contentions, and, given some priors, this is rather surprising.

tasks are performed, is relatively equal for Mongoloid men and women, and greater for non-Mongoloid women than men.[20] These are very few cases from which to draw conclusions; some of the studies involve very small numbers of observations, and methodological inadequacies in addition to the formidable methodological problems involved in researching these problems. Nevertheless, it is surely not reading too much into these studies to claim that what the present state of knowledge suggests is that work intensity varies considerably between different livelihood systems and agro-ecological conditions (including topography), as does the gender division of work intensity as assessed by PALs.

The nutrition model was developed in order to assess the nutritional requirements of populations, and thereby to assess food requirements and sufficiency; it may tell us relatively little about *stress* or the burden of work for the individual. The factorial method, based on PALs and time allocation, provides an estimate of the calories required by populations; it does not take into account physical work *capacity,* i.e., the ability to work intensively. This is what the physiological model has been used to do.

## ◆ The Physiological Model

This approach is based on the argument that an individual's physical work capacity is given by the maximum volume of oxygen (called $VO_2$max) that he/she can consume in performing activity (Astrand and Rohdahl, 1986). Oxygen is consumed in the biochemical processes that provide energy for BMR and activity. Since direct measurements of maximal oxygen consumption are difficult, $VO_2$max is usually estimated from the relationship between heart rate and oxygen consumption,[21] and it is argued that the maximal level of energy expenditure sustainable (over a full working day) is 35-40% of $VO_2$max, although for brief periods much higher percentages are possible.[22] This capacity depends on a person's active tissue mass, which is much the same as his or her muscle mass.

[20] But while this shows that both men and women in two ethnic groups in Nepal have some days with high PALs, it does not show the frequency of such days in the workloads of men and women. A more complete picture of the "heaviness" of women's and men's work in the gender division of labour is shown in the overall pattern, when all tasks and days are accounted for. Thus Strickland and Tuffrey (with very small numbers) show the following:

| Physical Activity Levels of Nepalese | | | | |
|---|---|---|---|---|
| | | Monsoon | Post-monsoon | Pre-monsoon |
| Mongoloid | Male | 1.98 | 2.01 | 2.16 |
| | Female | 1.52 | 1.67 | 1.82 |
| Non-mongoloid | Male | 1.88 | 1.98 | 1.87 |
| | Female | 1.57 | 1.62 | 1.50 |

Note: The number of cases is between five and seven only (Strickland and Tuffrey, 1997:135).

[21] Step tests, in which the subject wears a mask, to measure oxygen consumption, and a heart rate monitor are the standard method, with $VO_2$max estimated by measuring oxygen consumption at maximum heart rate, which is derived from the equation: maximum heart rate = 220 – age in years.

[22] It is suggested that the relationship between % $VO_2$max and the time for which this can be continuously sustained (endurance time) is given by a negative exponential equation % $VO_2$max = exp(-bt), where t is the endurance time and b is a constant. Dasgupta (1993) uses the finding that 80% $VO_2$max can be sustained for roughly an hour and a half, which implies that b is approximately 0.0023. It is not clear if this equation can be used when the activity is not continuous (see below), or if, when the activity is continuous, a person could legitimately be considered to have exhausted themselves for the day after an hour and a half of activity at 80% of $VO_2$max.

Two people may have the same BMI but differ in height; the taller typically has greater muscle mass and greater $VO_2$max, or physical work capacity.[23]

Partha Dasgupta (1993:436) argues that physical work capacity is closely related to physical productivity; studies of sugar cane cutters in Columbia (Spurr, 1990), coffee pickers in Guatemala (Immink et al., 1984), factory workers in India (Satyanarayana et al., 1977) and agricultural workers in India (Deolalikar, 1988) found close links between weight-for-height or $VO_2$max and productivity. What is the significance of $VO_2$max for gender and work intensity? Dasgupta suggests that men have higher $VO_2$max than women for the same stature and BMI, and therefore greater productivity, and there is considerable economic evidence relating height and BMI to wage rates (see below).[24]

However, greater *potential* physical work capacity should not be assumed to result automatically in greater work intensity — as we saw above, women in some cultures appear to be engaged in activities that yield higher PALs than men. Furthermore, the way in which the potential for hard work is realized depends critically on the social context of work; for example, working for piece rates clearly involves incentives to greater physical work effort than working for daily wages, and working on own-account farming is different again.[25] In her Nepal study, Catherine Panter-Brick (1997) argues that Nepalese men and women pace themselves to sustain work throughout the day (a "tortoise" strategy) rather than race to complete tasks (a "hare" strategy), and that there are advantages to this. In addition to the physical advantages of taking frequent pauses in work, she points out that a measured tempo of work allows the participation of anaemic individuals, who would otherwise suffer from oxygen debt at a fast pace of work, and that pregnant and lactating women can also participate fully. Her observations showed differing paces for individual women working during the monsoon in agricultural tasks (14 minutes per hour) and groups of women (19 minutes per hour), and noted that in groups, rest times enable lactating mothers to nurse. Panter-Brick argues that where labour is in short supply and everyone is expected to contribute to work, it may make more sense to pace work at a level where the maximum number of people can contribute across age and gender, than to pace work at a rate that would exclude some members of the community.[26] Under other relations — of wage labour of varying kinds, and seasonal timeliness constraints where tasks have to be completed urgently — hare strategies become necessary. In circumstances of a commodification of labour, and/or agricultural intensification (such as irrigation and double or cash cropping) which compresses the time available for tasks such

[23] $VO_2$max also depends on the "training" effect, or degree to which the person is accustomed to physical activity.

[24] Economists have found links between stature and BMI and wages, which suggests a productivity effect (see below).

[25] This does not, of course, mean that people with higher work capacity will be concentrated in activities rewarded by piece rates, or work on own account, since much more is involved in work than minimizing the cost of effort.

[26] This is not obviously the appropriate interpretation, since later she suggests that intensification leads to greater pace of work. It may be that where *labourers* are in short supply this is the appropriate strategy, or that participation in work by all is a condition of a moral economy of redistribution and social inclusion. Parker (1992, 1993) provides another example of women's work pacing strategies in the different context of cotton picking and domestic work in the Gezira: here women with high burdens of infection with schistosomiasis sped up their hard agricultural labour work in the hot sun relative to women without infection.

as land preparation, the physical work capacity of women and men may become more critical to survival, and more central to the valorization of women's and men's work. Understanding of the gendered effects of agricultural intensification may be improved by considering what kinds of labour increase for which people, and what the cumulative affects are when seasonal breaks are lost in continuous cultivation.

The experience of physical stress and burden, discussed above, may not be well-related to $VO_2$max for several reasons. First, absolute size may be an independent variable, for example the experience of stress of activity at 90% of $VO_2$max for a low BMI person may differ from the experience of activity at 90% $VO_2$max for a high BMI person. Second, actual tasks may require bursts of energy expenditure in excess of $VO_2$max, such as lifting a roof beam; such tasks are not easily accomplished by tortoise strategies. Third, few studies integrate time to % $VO_2$max.[27] For approaches which might tell us more about how energy expenditure generates fatigue, stress and burden we turn now to ergonomics.

## ◆ Ergonomics

Ergonomics attends to actual work tasks rather than nutrition and physiology, and it considers well-being outcomes other than nutrition, such as musculo-skeletal disorders, for example. Ergonomic observation of actual work shows that in most cases even a task that is rated as taking place at 35% $VO_2$max involves a combination of bursts of work interspersed with periods of rest rather than a constant rate (Müller, 1953; Kilbom, 1995). The health correlates of different combinations of work and rest are not clear, but frequent pauses are considered to relieve fatigue and enhance productivity more than the equivalent amount of time in a single longer rest; this implies that carrying a load at slow speed with pauses consumes less total energy.

The risk of muscular-skeletal injury is also increased with intense bursts of work and with the experience of fatigue. Jacqueline Sims, in her review study, identifies some of these as injuries from lifting, with a higher proportion of neck, arm and shoulder disorders for women which may be related to their lower upper body strength, skeletal damage from water carrying, disability consequences from high speed of work, and connections between high work intensity and the incidence of premature deliveries of pregnant women. She points out that physical work intensity is not the only form of arduousness — mentioning repetitiveness as another health hazard in work, and citing Thai data showing doubling or tripling of rates of miscarriage during rice transplanting and harvesting (1997:10). Sims's work is valuable in bringing together findings that suggest that work which is repetitive, monotonous and fast is characteristic of jobs employing mainly women, and that "light" work can become "heavy" under these conditions.

Fatigue is a characteristic of human activity with which we are all familiar, and everyday experience suggests that fatigue, and perceptions of it, are key features of allocations of domestic and household labour. However, it is surprisingly difficult

[27] In other words, activity is not reported in terms of the amount of time spent at different levels of $VO_2$max or maximum heart rate. Recent studies of activities of children report activity levels in terms of minutes per day at different levels of intensity; intensity was assessed as % $VO_2$max predicted from heart rate monitoring.

to pin fatigue down (Hockley, 1983:145). Several types of fatigue are common, including localized muscular fatigue, whole body fatigue, and other forms of mental or emotional fatigue associated with long or arduous activity. Fatigue has been investigated as it affects human performance mainly in the context of impairment of work or other physical activity. But clearly it has relevance to need for rest[28] and perceptions of needs and well-being, as well as ability and willingness to contribute to household activities. It must enter into everyday intra-household bargaining, just as perceptions of the value of contributions to household well-being (Sen, 1987).

Fatigue will impair muscular/motor and mental performance and ability to exert force. Other biological signs of impairment related to fatigue include increased electromyographic (EMG) levels and shift in the EMG power spectrum to lower levels (Edwards, 1981). Muscular fatigue sets in at the beginning of dynamic activity, during dynamic muscular activity exceeding 50 per cent of maximal aerobic power, and during static exercise exceeding 10 per cent of maximal muscular strength (Kilbom, 1995:644). Fatigue can be considered a stock, which builds up with activity above thresholds and in some relation to the intensity of work (Grandjean and Kogi, 1971); it is reduced by rest and relatively low levels of activity. There can be different forms of fatigue, which can be induced by a number of factors more or less alone or in various combinations. Fatigue impairs physical and mental performance in complex ways; it slows or decreases attention and perception, thinking and motivation (Eysenck, 1983), and almost certainly is a major factor limiting a person's productivity (McFarland, 1971). Measurement of fatigue can be accomplished in a number of ways, but is problematic. Fatigue can be decreased and/or avoided by suitable consumption; training; avoidance of excessive stress and strain including reduced absolute duration, physical force and speed of activity; bursts of work and allowance for recovery; use of tools and equipment; and rest. Clearly, by these criteria, for individuals who may become fatigued, rest should be considered not just a preferred leisure good, but a productive activity, which enhances productivity at later times. In this respect, rest or leisure can be considered a form of productive consumption like food, education or some forms of health expenditure.[29]

The implications of this review for gender and poverty are that, in poor societies dependent on human labour, men are biologically somewhat better equipped for heavy, dynamic, and static force-intensive work than women because of their physiology, stature, and absence of reproduction constraints; that both women and men are actually involved in effort-intensive work whether this is assessed by PAL, % $VO_2$max, or heart rate distribution criteria; and that the consequences of this for their well-being are locally variable but, we argue, often significant.

What we have yet to consider is how women and men benefit indirectly, in markets and livelihood production, from physical well-being and work capacity. We begin to address these issues in section 3. What particular, gendered, cultures

[28] Neither the nutrition nor the physiology models explicitly incorporate need for rest.

[29] Also, evidence from athletes shows that rest is necessary in response to severe and extended stresses that exceed the ability of the body to cope or adapt (Lovallo, 1997). It is not clear whether effort-intensive livelihoods at low levels of nutrition can produce similar effects; nevertheless, behavioural models of health postulate clear linkages between stress and health, which presumably extends to the types of nutrition and effort-induced stresses with which we are concerned.

make of these biological advantages and disadvantages in their discourses about work, and what gendered individuals experiencing the integration of work and well-being in everyday life (and over the course of a life span) make of them is the concern of sections below. Before addressing these issues, however, we consider some broader population-wide issues.

# 3. ADAPTATION, ENERGETICS AND GENDER DIFFERENTIATION

There is a long-running and intense debate in the nutrition and health literature concerned with poor countries around whether the small stature of populations represents adaptation to nutritional stress (Sukhatme, 1977; Seckler, 1982; Sukhatme and Margen, 1978; Osmani, 1992; Dasgupta, 1993; Payne and Lipton, 1994). While earlier work suggested that adaptation was relatively costless, and it would be possible to reduce estimates of nutritional requirements of populations considerably at little cost to well-being, typically expressed in the "small but healthy" epithet, more recent work has emphasized that adaptation may be functional but could not be considered costless (Payne and Lipton, 1994; but see also Payne, 1994). Smallness would be brought about by restricting the size of women, in particular, because of the relationship between low birth weight of both males and females and mother's height. In addition to discriminating against females to produce small mothers who would have small babies, males would be also be favoured because of their role in production and in labour markets, which reward larger size. Adaptation, in this argument, reflected the effects of nutritional and health challenges in the womb and during infancy and childhood, and should be considered as a scar that either impaired capabilities themselves or represented impaired capabilities. From the point of view of policy, the task was not necessarily to attack "adaptation" directly, but to find the optimal paths out of a situation of low productivity and nutritional stress for the population, so that it could reproduce itself with less of these costly adaptations. Of course, it is possible that there are several routes out of these adaptations, which might entail different gender distributions of the costs of adaptation. Also, different societies (or groups in society) might choose to forgo some adaptational advantage in the interests of gender equity.[30]

A similar line of argument is found in models of the energetics of human populations (Giampietro and Pimentel, 1992) This work focuses on the ratio between the energy input from the ecosystem into human society (EI) and the power applied by human society to the ecosystem (AP). The EI of societies based on human labour fuels both the work (AP) and the maintenance of the human society in non-working periods (the leisure, rest and sleep of working adults, the young and the old; and reproduction, sickness, disability and so on). Human energy is efficient in converting EI into AP when only the work itself is considered (i.e., energy expenditure during work activity), but when the full cost of maintaining and reproducing is taken into account, human labour based societies (HLBSs) are relatively inefficient. That is, the energy cost of producing the

[30] Thus, one might interpret in this way the significance of the "culture" variable in determining the difference in sex ratios between south and north-western India, even after accounting for other variables such as female labour participation (Agnihotri et al., 1998).

physical work capacity is high when compared to a society based on mechanical energy. In HBLSs, working adults consume energy when not working and a significant proportion of the population does not work or do much work, while machines only consume energy when actually working and the EI required to produce machines can be amortized against a long working life.

The ratio of the overhead of EI required to reproduce the physical work capacity of a society may be lower, and the energy efficiency of this society higher, at low levels of nutrition (Giampietro and Pimentel, 1992:26). Also, it may improve its energy efficiency by increasing the proportion of adult males in the system, and by limiting the numbers of children and elderly. However, children are required as future labourers and reproducers, and the "cost of a sustainable solution . . . is usually balanced in poor societies by smaller average body size and by a differentiation in human responsibilities within the society" (1992:24).

These conclusions are closely related to the nutrition, physiology and ergonomic models discussed above. First, to the extent that timeliness constraints (ploughing, planting and harvesting) and power thresholds (heavy weights, hunting large animals, carrying or lifting very heavy loads) are important to productivity, they make male labour energetically efficient. Raising the proportion of males raises the per capita power levels available to the society and reduces the EI to AP ratio. However, for many tasks there is little advantage to either sex since, while males are capable of exerting more power than women, this is offset by the greater nutritional requirements of males. Second, tasks that require low power levels and are not time constrained may be more efficiently accomplished by women through long hours of work, because of the lower metabolic requirements of their lower body weights (and ability to survive at low BMIs); this, in such models, accounts for the "traditional differentiation of roles".

One of the problems with such models is that they suggest a functional logic of a human society outside what it is that people, in a specific cultural context, think, know or perceive about the relationships between food, work, size, gender, etc. For such models to be meaningful there needs to be some connection between social outcomes, and the actions and perceptions of individual actors. Another problem is that systems models, which approach human societies as energetically self-contained, are of limited value in a world of deep interdependencies, social differentiation and change. Finally, precisely because of the low power capabilities of humans, technologies are critical to energy efficiencies; it is thus arguable that gendered efficiency/productivity differentials in unaided human effort are dwarfed by those which derive from differential access to and control of technologies. Nevertheless, we need to recognize that there are complex connections between the well-being of individuals and populations. Well-being/poverty analysis thus needs constantly to move between these levels, and to face the possibilities of policy trade-offs.

Some economic history using mortality and stature data appears to lend support to the functionalist predictions of the systems and adaptation models outlined above (Fogel, 1994a; Floud et al., 1990; Steckel, 1995; Harris, 1994; Johansson, 1996; Steckle and Floud, 1997). Height and mortality are indicators of well-being for which there are now quite extensive sets of data that capture not only the supply or consumption of goods but also the demands or needs for those goods, and show not only general improvements in well-being but also significant gender (and

regional and occupational) differences within countries and over time. Work, as the nutrition, physiology and ergonomic models show, provides one of the important sources of demand for goods. Growth in stature during childhood, reproduction (pregnancy and lactation), and recovery from illness or injury are other important sources of demand for food and health expenditures. Premature mortality and shortness of stature indicate health and nutrition insults early in and during life. Economic development over time, and higher class fractions at any point in time, generally display declining levels of mortality and higher stature. Health has clearly improved with development in the long run and is better in better-off classes.

To what extent do historical and class differences in mortality and height reflect the intensity of work, understood as work activity in relation to the capacity for that work? One recent interpretation suggests that the original escape from hunger was as much the result of reduced chronic undernutrition as of reduction in crisis mortality (Fogel, 1994b; see also McKeown, 1976 and 1979). In this account, an initial improvement in nutrition set off a virtuous circle (which proceeded in a spatially and temporally uneven manner) of increases in work capacity, work, productivity and consequent improvements in well-being, leading to capital accumulation and further improvements in nutrition and well-being. In turn, these increases in production per capita enabled further work and productivity improvements.[31] The full model requires changes in health environments to be incorporated in understanding temporal, spatial, class and gender differences in changes in these indicators, especially the role of urbanization, which initially was associated with less healthy environments leading to lower well-being. This could impact differentially on rural and urban dwellers of different gender and class (Johansson, 1997; Nicholas and Oxley, 1997; Johnson and Nicholas, 1997), but the general picture is one of increased work capacity, which must have more than offset the increases in work, since anthropometric indicators of well-being over the long run improved significantly. Such an account goes some way to explaining the apparent paradox of the "original affluent society"; which some have claimed to find in pre-industrial peasant Europe and in present-day traditional hunter-gatherer societies (Sahlins, 1974), and suggests, furthermore, that the industrial revolution was also an "industrious revolution" (de Vries, 1994).

The implications of this for contemporary poverty reduction policies are that health and nutrition improvements must parallel or precede increases in work intensity, which might otherwise be linked to conflict over the distribution of effort, nutrition and rest, or even a vicious circle of impoverishment. The next section raises the question of whether economics supports the idea that excessive effort is likely to be harmful to vulnerable groups.

# 4. ECONOMICS AND WORK INTENSITY

The adaptation and human energetics models are functionalist in that an individual's actions, and their well-being outcomes, are determined by the

[31] The study of real wage rates has also contributed to these debates; rising real wages rates are likely to be associated with rising consumption of necessities and hence improvements in health (provided health environments do not deteriorate to offset these improvements), nutrition, well-being and productive capacity.

requirements of the system. This neglects the numerous alternative ways in which outcomes may be determined, as well as the need for a satisfactory social science explanation of the behaviour of individual humans and the consequences of that behaviour. Economics attempts to provide explanations for human behaviour in terms of the interactions of rational individuals, although work intensity is one variable that is generally only considered implicitly. Nevertheless, various economic models and empirical analyses bear on these issues; we present some of these perspectives below, while keeping in mind the critiques of feminist economists (Folbre, 1986 and 1996; Hart, 1997).

Economists have argued that there are relationships between nutrition, health and productivity which help to account for several phenomena. These include the "original escape from hunger", discussed above, the existence of under- and unemployment in poor societies, wage rate differentials and different modes of payment for work, investments in health and nutrition, and intra-household allocations of food and health expenditure.[32] Here we can only briefly review these debates.

Economists have had a recurring interest in the insights that a nutrition-productivity relationship might provide into processes of economic development and unemployment, and the institutions of society, and their role in enhancing or hindering productivity and well-being (Liebenstein, 1957; Mirrlees, 1975; Bliss and Stern, 1978). The existence of nutrition-health-productivity relationships has profound implications and has been used to account for both separation of people into better fed workers and the destitute (Dasgupta and Ray, 1986 and 1987), which can be reproduced over generations, and for intra-household inequalities (Dasgupta, 1993 and 1997).[33]

Conversely, a number of authors have suggested, in the words of Strauss and Thomas, that, notwithstanding the relationship of BMI to $VO_2$max, "many jobs do not require maximum physical effort, so it is not obvious that energy or other nutrient intakes should be correlated with either productivity or labour supply" (Strauss and Thomas, 1995:1909).[34] Furthermore, there is little evidence that physical work capacity per unit of body weight varies with body size, at least over normal ranges (Payne and Lipton, 1994). Nevertheless, for the social groups we are concerned with — the landless poor and women — most of the empirical evidence suggests that stature and BMI are associated with wage rates (Strauss and Thomas, 1995:1917).[35]

[32] There is a large and methodologically contentious literature on intra-household models, which has been omitted for reasons of space.

[33] And, as Dasgupta points out, "[O]ne doesn't need bargaining theory to account for it [intra-household inequality]" (Dasgupta, 1993:334 and chapters 14-16). In some cases it seems that there may be no difference between the empirical predictions of orthodox models and bargaining models (Haddad et al., 1995). Partly as a consequence, some critics of orthodox economic models of households focus mainly on the assumptions of such models rather than their empirical predictions. There is considerable empirical evidence against income pooling in households, but in favour of consumption being Pareto efficient; on the other hand, household production may not be Pareto efficient in that too few resources are allocated to activities controlled by women (see Doss, 1996, for a recent review).

[34] Payne and Lipton also use this argument in suggesting that adaptation is not particularly costly. Dasgupta draws different conclusions.

[35] "Specifically nutrition related dimensions of health, are associated with higher labour productivity" (Strauss and Thomas, 1995:1917). Econometric work in this area shows that

In general, economists have realized that many forms of consumption, including education and training, health expenditures and food consumption, and also rest and leisure, may have effects on productivity (positive and negative) that need to be analysed as different from consumption, which has no such effects (Suen and Mo, 1994). This is what we call *productive consumption.*[36] If higher male stature and BMI brings extra income into households then men will consume more food (Strauss and Thomas, 1995:1909), as a form of productive consumption, and this may extend to include rest; Dasgupta says "a poor household cannot afford to treat its members equally" (1997: 27). Whether this calorie reinforcement to men raises the well-being of all members of the household is disputed, but the evidence we have put forward suggests that (a) the extra calories consumed by men do not greatly advantage them, at least in terms of anthropometric indicators of well-being;[37] and (b) it is not at the cost of women's reproductive capacity, in the narrow sense of ability to conceive, gestate and lactate, which is rarely threatened by insufficient calories. However, it does appear to be at the expense of the nutritional well-being of young girls, at least in much of South Asia. Stunted young girls grow up into women with lower absolute capacity for heavy work, and consequently can be expected to have lower productivity and wages; and there is clearly a need for understanding this phenomenon in terms of whole households or families, and life cycles.

This model has weaknesses. Despite the fact that this account of work intensity provides further reasons beyond those given by Dasgupta to explain intra-household inequality among very poor households, it only applies to nutritionally constrained households and cannot account for gross discrimination against the female child in better-off households (Agnihotri, 1997), the abandonment of women and children in crises (Agarwal, 1990), or the treatment of widows among the absolutely non-poor.

The work on health-nutrition-productivity, and human capital investment, reviewed by Strauss and Thomas does not generally address the characterization of work intensity and burden we have given here (see also Palmer-Jones and Jackson, 1997; Haddad and Hoddinott, 1997); however, it is possible to see how these concerns can be incorporated into this work. Indeed, the orthodox model of the household can also suggest that effort intensity is a significant dimension of resource allocations by individuals during their lifetimes and within households (Becker, 1985 and 1991:54-79).[38]

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wage rates are associated with a wide range of variables besides stature and nutritional status, including gender. We do not critique this literature here, as it goes well beyond the scope of this paper. See Folbre, 1996 and Hart, 1997, for gender critiques of the household and gender modelling of orthodox economics. While many authors have contested the empirical existence of nutrition efficiency wages (see, for a recent example, Swamy, 1997), all we are doing here is putting forward the quantitative evidence there is relevant to our speculations.

[36] Productive consumption can include a wide range of other goods, including labour supply, and even consumption of productivity harming goods (alcohol or tobacco), and household public goods (and bads) which affect the productivity of household members.

[37] As noted below, the greater life expectancy of Indian women compared to men after their mid-30s may be due in part to tuberculosis and excess male mortality related to under-nutrition (Dyson, 1987)

[38] To illustrate these points: "The stock of energy at a particular age might also be augmentable by 'borrowing' from other ages, perhaps with substantial penalty or interest"

Only Pitt et al. (1990) incorporate effort intensity directly into an analysis of the relationships between calorie consumption, income and work. Using a unitary household model, these authors incorporate the (presumed) energy intensity of work activities[39] in their account of intra-household allocations of consumption and effort.[40] In this model, the food consumption, health and work effort of individual household members are arguments in household utility (the first two increasing, the last decreasing, well-being). Individuals have their own specific endowments of "healthiness", but belong to categories that have health and wage functions. Health of a class of individuals is produced by individual endowments, enhanced by consumption of food and harmed by effort intensity. Wages of an individual of a given class reflect the health of the individual and their effort intensity. Effort, therefore, has a direct negative effect on well-being, as well as indirect effects through harm to health and increase in wages.

In the model used by Pitt et al., food consumption by an individual is a good in itself; it also raises income through improving health, and hence wages. Different classes of individual are assigned to different activities where the relations between health and wages are quite different. More effort-intensive activities show higher returns to health and hence to consumption of food, and are more likely to be done by men, as in most South Asian circumstances. This is reflected in correlations between health, calorie consumption and wages for men but not for women, which may be reasonable for much of South Asia (but see Strauss and Thomas, 1995, who report a positive correlation between the BMI of women and their wages in Brazil). This may go some way to rationalizing the greater consumption of food by men than women, and their greater stature. These authors conclude that men indeed get "calorie reinforcement", but it is not sufficient to compensate them for their extra calorie expenditure, and that males and females with high health endowments (innate "healthiness") are taxed to increase the welfare of others (Pitt, 1997:36). This work does not explain why male efforts are rewarded in markets more than female, although it does provide an explanation for allocations of additional nutrient intakes where this affects "the likelihood of being able to work in strenuous but high paying jobs" (Strauss and Thomas, 1995:1917).[41]

**Figure 2**
**Model of Pitt et al.***

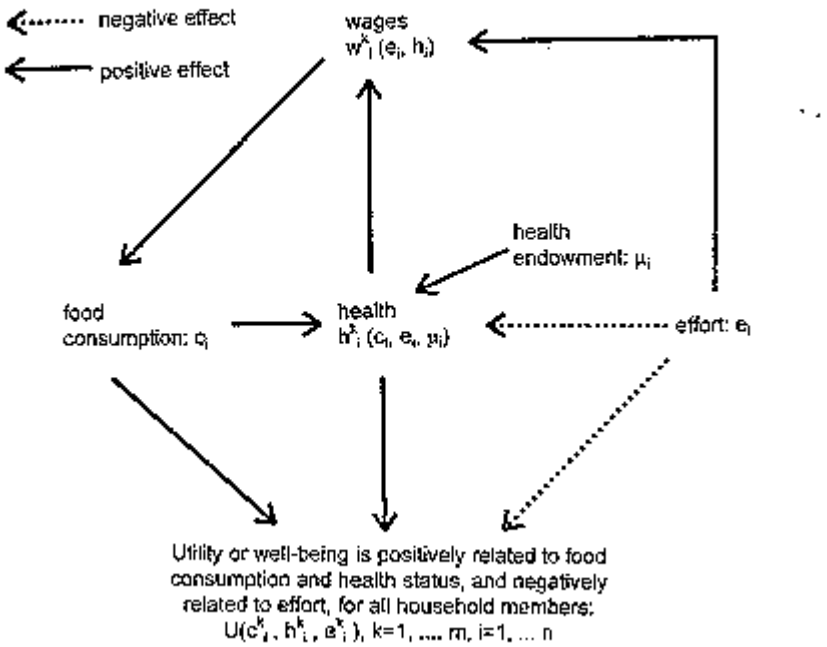
(Becker, 1991:73); "[D]ifferences in effort intensities have important implications to sexual differences in earnings, hours worked, and occupations" (Becker, 1991:74).

[39] Pitt et al. (1990) use categories of work activity, which they classify by intensity into five levels. They do not use quantitative measures of work intensity (such as total energy expenditure).

[40] See also Pitt, 1997 on the problems of estimating such models; in particular there is the need for an exceptionally rich data set that must not suffer from omitted variables which might affect productivity.

[41] However, these authors note that "to the extent that omitted factors or specification error are incorporated in the residuals, they may be correlated with a propensity to work in high-return, more strenuous occupations. As Pitt notes, this would make the method of estimation invalid.

**Figure 2**
**Model of Pitt et al.***




* Pitt et al. (1990) first estimate a health production function, the residuals from which they use as health endowments. Then they estimate the intra-household calorie allocation equation using the individual's and gender disaggregated household average health endowments; they also estimate per capita household income and the probability of participation in work classified as exceptionally active. From these estimates they derive their conclusions.

In summary, high BMI is well-being enhancing in that it attracts higher wages, for men and women but more so for men. In Nepal, however, studies of how stature connects to social mobility as a process rather than as a static correlation with wages suggest complex links and serious methodological challenges (Strickland et al., 1997).

Conversely, economists see effort intensity as threatening to well-being, as characteristic of male work patterns and as justifying calorie compensation to men. However, their analyses of the gender distributions of such threats are rather limited by the paucity of data on the effort intensity of some forms of women's work, such as water and firewood collection, grain processing, and the characteristic simultaneous multi-tasking of women. Finally, arduousness of work is, as we point out above, not confined to peaks of energy expenditure alone, and tasks such as weeding and transplanting suggest different kinds of burden. Nevertheless, economists' models do suggest grounds for caution in advocating labour-intensive policies, such as earthworks and construction employment, which are effort-intensive for certain people — notably, poor men already reliant on wage labouring livelihoods, and poor women who also bear the bodily insults of childhood disadvantage.

# 5. EMBODIMENT, WORK AND GENDER RELATIONS

Economic models give little consideration to the politics of what is considered to be work, what work is ideologically valued and devalued, how notions of skill are gendered, and what processes other than economic rationality influence divisions of labour. These are the strengths of gender analysis, which has valued and made visible women's domestic labour. Gender analysis has also demonstrated the substantial contribution made to farm work and rural transport by women in a wide range of societies, not only those characterized as "female farming systems" by Boserup; it has shown the caring labour, mainly done by women, in childcare and that of the sick and elderly; and it has shown community work contributed by women beyond household boundaries. Studies of gendered divisions of labour at the household level have been concerned with how equitable they are, and have tended to see the length of time of work as the important focus in establishing this. The more limited research on the character and content of women's labour has been concerned with the extent to which child bearing constrains women's work; "decision making" power by women in social relations of work; the ways in which women can or cannot command the labour of others; levels of control over returns to work and incomes; and exclusions from technology. Taken together, predominant approaches to gender analysis of development emphasize social relations of subordination and ideological constructs which devalue; these are juxtaposed with evidence of time use demonstrating excessive work for women — hence the terminologies of double and triple burdens (Moser, 1993) and time-famine. There are two questions which seem to require further thought, however: Why does an apparent level of over-work by poor rural women not show up in comparative BMIs for women and men of such households; and how (if one does not see patriarchy as all-determining) do women as actors come to be victims of such an order?[42]

We argue here that shortcomings in the ways we have thought about gender, women and work include the exclusive concentration on time as a proxy for burden, effort and equity; and the neglect of the lived experience of work of individual persons, which informs choices and preferences and becomes the basis of positions adopted in (implicit and explicit) intra-household bargaining over labour, and agency in general.

[42] There are also unanswered questions about the relative longevity advantage of women in South Asia from the age of 35. Dyson (1987) suggests this is related to tuberculosis, which is typically a disease of poverty. Comparisons of male and female adult mortalities are made complex by lack of agreement about "natural" differences in longevity and the extent to which excess male mortality is related to harmful "lifestyle" choices of men, and the explanation of these choices. With reference to the former point, Anand and Sen (1995:5) suggest a five-year natural advantage; Murray (1994:8) suggests a two-year advantage. Johansson (1996) suggests there is no natural difference for populations with equivalent healthy lifestyles, using the evidence that at age 27 there is no difference in the life expectancies of Seventh-day Adventists in the Netherlands. In human populations, longevity is always partly socially constructed, and one would expect any significant disadvantage to be a matter of public concern.

While time use studies have been of great value in making women's work visible, it is time to move beyond time allocation as the only metric of work, to resist the conflation of all forms of activity other than sleep as "work" and to recognize how male gender roles in divisions of labour can also involve vulnerabilities for specific groups. This direction might better illuminate the gendered connections between work and well-being for women and men, than the implicit structuralist caricatures of women as over-worked victims and men as lazy patriarchs.

But the main focus of what follows emphasizes the second issue: the significance of the experience of work for both direct and indirect connections of work to well-being. By direct connections, we mean the ways in which having a particular kind of body (female, male, large, small, healthy or unhealthy) — a certain level and kind of *body capital,* the cumulative outcome of health and social interaction of the person to date — affects how burdensome a particular task *feels* to a gendered subject. We have tried to establish above that heavy work is likely to be objectively more burdensome to many women than men; here, we consider how that might be perceived and the implications of such perceptions. By indirect connections we mean the ways in which these bodily differences enter into social relations of work, in both wage labour markets and intra-household negotiations over work.

A difficult methodological problem in this area is the slippage, in bargaining metaphors and models — between population and household levels of analysis, without consideration of the methodological implications of such elision. One issue is that while population averages for gender differences may be distinct, there can also be considerable overlap between the ranges for men and women, such that average variation does not mean very much. Thus sexual dimorphism in a population may be clear, but what matters for intra-household bargaining is the *specific* dimorphism of particular spouses — i.e., the relative differences in size, strength and bodily capabilities of men and women in a particular domestic group. Bargaining, as many economists describe it, is a useful way of imagining the strengths and weaknesses of a population-wide gender categorical "bargaining", but this is not the same as describing the actual or implicit discourses between individual members of a domestic group.[43] Generalized fallback positions (outside marriage or within it)[44] of men and women are highly relevant, but, given multiple identities and capacities for struggle, they cannot be complete accounts of weakness and strength in conjugal relations. The elaboration by Sen (1987) of objective and perceived contributions and interests is a major step forward — but we suggest that a focus on the embodiment of work is one way to understand the *linkages* between work as an objective contribution, on the one hand, and the perceptions of its value by household members, on the other. It seems likely that the differential recognition accorded different forms of work by household members is not simply a construct of gender ideology, but connected to either a personal bodily experience of what it means to do that work, or observations of the bodily effects of that work on others — sweat and fatigue, injury, wastedness, vulnerability to disease. Where gender divisions of labour are relatively flexible —

[43] The social structures of constraint and opportunity may be valid as accounts of the circumstances faced by women as a social *category*, but inadequate for predicting *particular* bargained outcomes for two important reasons: first, women bear multiple identities; and second, they are variously able to resist and reformulate structures of constraint.

[44] See, respectively, McElroy, 1990, and Lundberg and Pollack, 1996.

for example, weeding in many African societies — then the former may be significant, and where they divide relatively rigidly then the latter is possibly more so. In both, discourses of value around assertions of the bodily demands of different kinds of work are likely to be significant in the *processes* by which women's work, men's work, and shared tasks not only create value but are understood to do so.

Relatively small size and a female constitution can mean that the burden of effort-intensive work is greater for women, and an aversion to some forms of such labour would not be unexpected. Aversion to heavy manual labour is hardly unique to women — after all, much of human "development" has been about the evolution of technology to reduce drudgery and manual work and raise productivity — yet the "controlled discomfort of work" (Scarry, 1985) is possibly experienced more acutely by subjects with female bodies — for example, if the work involves static loads — because women generally have less upper body strength, smaller stature and so on.

In addition to the idea that personal experience of burden is an incentive to avoidance of heavy labour, the concept of *body projects* suggests that women (and men) may implicitly strategize a life course in which body capital is built up, maintained and carefully expended towards the achievement of social and personal goals (Jackson, 1997), which contribute to well-being states of various kinds. Thus reproductive intentions, for desired family size and structures (Bledsoe, 1995), and working livelihoods, come together in the idea of an embodied subject husbanding his or her physical resources, building up strength and avoiding its depletion, managing the hazards and demands of childbirth and reproduction, and of work, over a lifespan whose course is partly scripted by social and economic structures and ideologies, partly extemporized, and studded with unpredictable events and unexpected outcomes. Body management and adjustment to body capability take place over a range of scales, from the working day to the life course. An example of the former is the increased work pace but decreased work time of women infected by bilharzia doing agricultural labour in Gezira in the Sudan (Parker, 1992 and 1993). However, the activity time and intensity of domestic work was not affected by infection; nor was the well-being of children, suggesting effective strategies and priorities in managing work intensity.

The ways a woman faced with onerous and well-being threatening work may husband her body can include economic strategies (hire labour for the task), relational strategies (persuade a daughter-in-law, husband or child to do it) or technological strategies to reduce drudgery. Relationships are resources that can be deployed in this way, and ideologies of work — e.g. discourses of strength and masculinity, of endurance and femininity — may have real value to women in their body projects. Body projects are not governed by narrow self-interest, since one's own well-being depends on the well-being of others. The much commented-upon altruism of women, and their concern for the well-being of others, e.g. children and spouses, may be not only essential — or even socialized — goodness, but a reflection of the extent to which their personal material well-being indeed depends on the health of spouses, children and so on. When Sen (1987) observes that women conceptualize their welfare in terms of family welfare, this may not be entirely the altruistic "false consciousness" he suggests. Broadly, the idea of body projects also suggests an intentionality in relation to health and well-being, of

selves and others, rather than a passive experience of well-being as a condition[45] — without, however, suggesting that social structures of disadvantage do not constrain the room for manoeuvre.

The advantages of an approach such as this, for understanding both gender divisions of labour and gendered well-being, are considerable. While it is impossible in the present paper to trace the implications for how one understands the genesis of gender divisions of labour, or how women and men come to do the work that they do in any particular space-time location, some of the conceptual advantages of thinking about well-being with an emphasis on embodied subjectivities are indicated next, before taking up the implications for policies on gender and poverty in the last section.

First, it has now become possible to think about biology and well-being in ways which are not biologically deterministic, since biology is no longer conceived as fixed and unchanging. Rather, the human body is seen as an incomplete project whose material form is transformed — through the inscriptions of health and working experience, culture and the intentions and choices of actors — over a lifetime. The neglect of the body in gender and development discourses is at least partly a result of anxiety about biological determinism — which social theorists have, in different ways, moved beyond (Shilling, 1993; Connell, 1987).[46] While 20 years ago "body talk" invoked ideas of "biology as destiny", it is now possible to see the body as central to the very antithesis of determinism, to agency.

Second, the move away from mind-body dualism and towards the idea of embodied subjectivities has been liberating. Our subjectivities are grounded in the lived experience of particular, though malleable, bodily existences. The idea of embodied subjectivities (Moore, 1994) retains the emphasis, in current understandings of poverty and well-being, on agency; that is, the experience and perceptions of women, or poor people, themselves, as subjects rather than as (only) the objects of development interventions.[47] This is important not only for ethical and feminist reasons, but also because social action follows from subjectivities, and thus agency is centrally important for understanding possibilities for and responses to development policies, projects and interventions in general.

The concept of body capital is especially useful to poverty analysis because it attends to the resource that poor people rely on more than any other — their bodies. That is, their physical endowments, their labour entitlements, their extended entitlements to the labour of others (or their products), their capabilities and functionings, and their achievement of well-being. Body capital potentially converts to other forms of capital — in the ways differently embodied subjects experience differential returns to work (economic capital), differential cultural approval (symbolic capital), differential conjugal relations (social capital). If bodies are valuable assets for the poor, and for women, they ought not to be extravagantly squandered in effort-intensive activity.

[45] Economists have for long thought of well-being as related to whole life-cycle consumption (Modigliani and Brumberg, 1955; Friedman, 1957), and can readily conceive of borrowing productive potential from later in life, as noted above (Becker, 1985).

[46] Another factor is the focus in Western discourse on "libidinous" bodies, rather than labouring ones (Turner, 1996).

[47] Although of course "objective" disadvantage exists beyond the perceived, and cannot be excluded from an understanding of poverty and gender disadvantage.

An illustration of how embodiment is complexly connected to well-being is illustrated in the following case, drawn from an ethnography in south India (Maclachlan, 1983:246-252).

"Big Rama was simply the strongest person anyone had ever met" (1983:247). He came from a village some miles away, and a fragmented family in which his father's brother cheated him of his land rights on the death of his father; and Rama then married matrilocally into the house of Little Hanumappa, who had a marriageable daughter, Venktamma, and two sons (the older of whom was frail and the younger just an infant), on the promise of becoming a co-parcener of the estate. Rama says:

> When I came to my father-in-law's house they had nothing. They were not working hard; their fields were badly cultivated . . . Their fields were not level, and I worked two years to get them even up and down. See, I worked day and night; I dug one well and put the pump set on it; I got a lot of the gardens planted in mulberry . . . I was feeding the silkworms with no-one to help me and I worked in the gardens, the paddy fields, and in the *raagi* fields. Some people in the village told me, 'Look, your father-in-law's a very stingy man; you have worked for him for ten years and he has given you nothing' (1983:247).

Rama became mentally depressed and physically injured by a wound which did not heal for some time; his wife intervened to suggest separating their household from her father's to limit the exploitation of her husband, and eventually the village headman intervened to insist that Hanumappa register a few acres of land in Rama's name. Rama was used by Hanumappa to renovate and modernize his farm.

Maclachlan's statistical data suggest that Rama indeed "produced almost as much useful work during his 10-year servitude as Little Hanumappa and his eldest son combined" (1983: 248). Venktamma, meanwhile, also worked extremely hard in farm work but also in managing to bear five children, look after eight, and preside over continual household conflict. It was ultimately the threat to Rama's health that led her to declare that "she would rather live in a tree than continue in such a madhouse" (1983: 250), and to initiate the household partition which was to end her natal family's exploitation of her strong and capable husband.

One of the interesting features of this case is that Rama and Venktamma ultimately obtained land through the intervention of the village head, and the widespread support for a couple who represented the local ideal of strong, provisioning men and supportive reproducing women, what Maclachlan calls the "*dharma* of the sexes". Rama's and Venktamma's management of their bodily capital earned them significant symbolic capital. This perspective also reinforces the social relational ways in which well-being is sustained — and, as gender analysts have long argued, we need always to consider how gendered actors have variable ability to transfer and delegate work to others, and to control the labour power of others. What we suggest here is that notions of strength, vulnerability, endurance, and other work qualities and gendered capabilities, are discursive resources through which such "allocations" of work, rest, consumption, expenditure and so on occur.

# 6. IMPLICATIONS FOR POLICIES AND RESEARCH

It has recently been argued that gender and poverty are distinct forms of disadvantage, which should not be collapsed either conceptually or practically (Jackson, 1996). The present paper elaborates another element of this argument by proposing that the bodily endowments of women and men — which are a combination of biological "givens", socio-cultural phenomena, and personal projects of transformation of bodies that change and age over a life span — mean that they experience physical work differently, experience (and contribute to) discourses of value in work differently, and express agency differently. If women seek to sustain bodily well-being through avoiding heavy work, to the extent that this is possible, then poverty reduction programmes need to consider carefully how a range of interventions may impact on their ability to do this. For example, Kinsey (1997) has recently expressed surprise at the apparently perverse effects of land reform on child nutrition in Zimbabwe. Yet many gender studies, since Hanger and Moris's work on Mwea (1973), have shown that when land is allocated to households as units under a male head, women can find their work loads increasing, as they contribute labour for farming larger areas of land. "Extensification" through land reform can have perverse effects on women within households; Cheater (1981) demonstrated this in her work on small-scale commercial farmers in Zimbabwe where polygyny, as a labour recruitment strategy, was part of a "traditional idiom of accumulation" and came to be utilized to meet labour demands; and others have documented resistance by women to irrigation schemes which implied increased demands on women's farm labour (Jones, 1986; Carney, 1988). Struggles over women's working bodies are hardly new, but we suggest that they have well-being consequences for women and, possibly, their children.

We briefly comment here on some of the implications for research and policy which might follow from a renewed attention to embodied subjectivities, gendered well-being, ill-being and work.

## ◆ Effort-Intensive or Entitlement-Intensive Growth?

The Washington Consensus on a New Poverty Agenda envisaged routes out of poverty through labour-intensive economic growth, and targeted welfare and social security. However, in this paper we suggest that effort-intensive employment and social security may not provide much of an escape from poverty. Appropriate technology for labour-intensive growth which failed to distinguish between effort-intensive and entitlement- or capability-intensive employment, would have very different implications for well-being outcomes compared to employment that yielded similar returns for lower levels of energy expenditure or greater returns for the same effort.[48]

## ◆ Sustainability

[48] The need to consider "effort saving" in relation to the New Poverty Agenda has been noted elsewhere, but only in relation to the situation of poor women (Lipton and Maxwell, 1992:11; see also Pitt et al., 1990:1155). In this paper we put forward evidence which, *prima facie*, suggests that effort may be constraining for poor households in general and for each individual member, male and female, separately.

Considerations of sustainability also suggest increased human effort-intensive technologies, or imply a less favourable ratio of human energy input (AP) to energy appropriated from the environment (EI). Thus reduced use of fossil fuel-based agro-chemicals and mechanical power may increase the human contribution to AP and lower its productivity in terms of EI.[49] A number of poverty-reducing environment friendly interventions in Bangladesh, such as the treadle pump for irrigation of staple crops, and labour intensive infrastructure construction and maintenance, use technologies which are clearly effort intensive (Palmer-Jones and Jackson, 1997), and work at them needs to be paced.[50]

Reducing poverty might be facilitated by reducing the burden of work and raising the capacity for work. This suggests increased focus on poverty reduction and egalitarian economic growth, but also implies that even poorly directed growth might have more than trickle down benefits for the poor if there was some relief of nutritional constraints. Thus an increase in agricultural productivity might go some way to enabling a break-out from "agricultural involution", or a Malthusian trap, by kick starting the type of virtuous growth of human labour-based production, investment (even by consumption) of surplus into capital accumulation. This would enable further increases in net production and growth, as has been suggested occurred in England during the 1730s (Fogel, 1994b; Komlos, 1990). We might speculate that such a mechanism accounts in part for the medium-term reductions in poverty that have been associated with Green Revolutions — despite incomplete agrarian reforms and in the face of initial poor assessments (Singh, 1990; Lipton and Longhurst, 1989). We can see in such arguments the possibility that exploitation of the environment in the short run may be a necessary evil in the transformations of poverty reduction.

## *Targeting*

Self-targeting through the labour test — i.e., offering employment to people at such low levels of reward that the non-poor do not compete for the jobs, as in food-for-work programmes, for example — was envisaged to have a major role for both crisis and chronic poverty situations; since the labour test relies on the disutility of the work to screen out the less poor, it is also, by design, effort intensive. Methods of implementation of effort-intensive food-for-work programmes also need to consider the well-being implications of payment alternatives — piece rates are common, for example, in paying per unit of soil dug, but encourage greater bodily self-exploitation than daily rates. Self-targeting through the labour test may thus prove an energy trap for the poor and for women ill-equipped to bear the bodily costs of energy-intensive work.

A further concern for policy implementation is that targeting resources to vulnerable groups meets serious intra-household obstacles. Existing allocations oriented to favour "productive" members may be quite resistant to attempts to alter them; thus feeding one member of a household may result in food that would have been allocated to that person being reallocated to others. Similarly, work patterns

[49] Thus part of the success of the Green Revolution in improving well-being arose because it raised the productivity of human labour.

[50] We can note the way that labourers in earthworks projects in Bangladesh carry loads for relatively short distances before exchanging them with another worker and walking back to pick up another load. This appears to be a form of work pacing, by dividing the work into bursts of relatively high intensity alternating with walking during which some recovery occurs.

and gender divisions of labour within households are not readily altered by involving women in extra-household employment, unless the returns to such employment are substantial.

## Productive consumption

If — as we have argued — high work intensity, here given as peaks of energy expenditure, and other forms of arduous labour, such as long periods spent at more moderate energy expenditure levels, can be damaging to well-being, then rest should be considered a form of productive consumption. The implications of this for research and development policy might be that we need to reconsider the crude use of time inputs alone as a measure of work burden, since an individual engaged in work producing fatigue needs time to recover, which should be factored into measures of work contribution. Similarly, multi-tasking may suggest such an "effort weighting". For development policy, the implications of treating rest as productive consumption would be to revise the idea that labour-saving technologies have to be justified by showing the "productive" use of liberated time. For example, arguments for domestic water service provision have generally been required to show that they are productive in the sense that women who spend less time on water collection will spend more time farming. As Carr and Sandhu (1988) have argued, this has been problematic. However, if rest time is seen as productive consumption this recasts the issue — not as welfare versus production, but as different forms of productivity.

## *Some methodological implications for gender and poverty research*

Understanding gendered disadvantage is deeply dependent on having a dynamic perspective over the life cycles of women and men. As a number of studies have shown (for example, Kynch and McGuire, 1994), age and gender interact in dramatic ways — depriving girls is associated with apparently better BMI for surviving adult women relative to adult men, who have not been deprived as boys. One implication is that successful attempts to reduce discrimination against the girl child in India might have to expect to initiate labour saving technologies for adult women, who may otherwise face greater health challenges as adults. How widely and under what circumstances this pattern occurs is clearly an important topic for research. Does it occur in China, which also has an adverse-to-females sex ratio, for example; does it occur in Sub-Saharan Africa?

We have also argued here against reductionist uses of bargaining models and the tendency to elide population and household levels in discussions of "bargaining". There remain thorny problems in economics over how to distinguish empirically between alternative models of households, even when the income-pooling hypothesis is abandoned. More challenging is the task of showing how an emphasis on agency can be incorporated into the bargaining approach.

In this paper, we have tried to extend a relational gender analysis to men as well as women in order to understand the complex patterns of gendered disadvantage in poor rural societies. It seems important to avoid assuming universal, cross-cultural and ahistorical female disadvantage (Messer, 1997), and to thereby both ignore specific areas of male disadvantage, and miss the insights that follow from examining the spaces in which women are not disadvantaged. In addition to debates in terms of the assumptions of models (always likely to be simplifications that miss crucial issues), we argue for a proportionate attention to descriptions, an exploration of mechanisms, and a consideration of predictions and outcomes.

Finally, on a practical note, comparative indicators of gender disadvantage might usefully include statistics on adult BMIs,[51] childhood stunting and age-specific mortality differentials, in addition to time allocation and life expectancies. Further refinement of the factorial method, by producing PAR tables that are representative of the activities and situations of relevant (poor) populations and the wide range of domestic labour, would also be useful.

[51] This would re-emphasize the importance of adult as well as child well-being (Reich, 1995).

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