

## WOMEN, HUMAN CAPITAL AND LIVELIHOODS: AN ERGONOMICS PERSPECTIVE

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*Human capital is often considered in terms of the new skills which development initiatives should seek to impart. This paper argues for complementary perspectives which are also consistent with a livelihoods approach. It first outlines the factors that need to be addressed if existing human capital is to reach its full potential (or vulnerable individuals protected). It then suggests what contribution ergonomics can make to safeguarding and enhancing human capital.*

### Policy conclusions

- Work-related ill-health causes significant economic losses in developing countries. It impacts especially on low-income labourers and the self-employed.
- Among its principal causes in rural areas are poor working conditions, poor design of new technology and inadequate safety precautions.
- Women's physiological characteristics and reproductive requirements make them especially vulnerable to work-related ill-health.
- Reducing vulnerability to work-related ill-health will be a slow process: there is scope for re-designing regulation, but its implementation, especially in the informal sector, remains problematic; there is also scope for designing equipment to incorporate both gender compatibility and greater operator safety, even under poor maintenance.
- Many of the opportunities for supporting women in this area are embedded in the wider developmental requirements of improved access to resources and to services, improved skills and reduced discrimination.

### The human factor in development aid

#### Introduction

A number of international organisations have recently adopted 'livelihoods' approaches to development, among them the United Nations Development Programme (UNDP) and the UK Department for International Development (DFID). By centring on people, these allow development initiatives to identify and support people's livelihood strategies. These strategies, in turn, are conditioned by the vulnerability of the contexts in which they live, and by the opportunities and constraints they face in economic, social and institutional conditions. Central to the conceptual framework developed as part of the DFID approach Carney (ed.), (1998) are the capital assets on which the poor draw in pursuit of their livelihood strategies. These include physical (i.e. infrastructure), natural, social, financial and human components. Individuals possess (or can access) these in varying proportions, and will build them up (or draw them down) in response to the changing patterns of strategies, outcomes and contexts.

To consider human capital largely from the viewpoint of how it can be built up by donor interventions is a limited perspective in the context of this conceptual framework. This paper argues for a broader perspective. It first identifies the conditions affecting individuals that need to be addressed as a prerequisite for strengthening human capital. Particular attention is given to the conditions affecting women. It then focuses specifically on work-related health problems, and suggests how the role of the state can be modified to address occupational health problems in rural areas.

### Constraints to human capital development

#### *The human energy trap*

Many poor people can be described as being in an 'energy trap' i.e. having to maintain subsistence through high levels of energy expenditure leaving little residual time and energy for other activities (Longhurst, 1997). Furthermore, poor people are locked into low productivity occupations. Although they diversify, they rarely have assets (skills, knowledge, information, command over labour and technology, or credit) to allow them to switch into occupations offering higher returns to effort.

#### *Health, working potential and productivity*

Health impairment or illness can affect the ability of people to perform essential tasks and can bring severe distress – even destitution – to families. Poor occupational health often impacts particularly negatively on women and their dependants, as discussed below.

#### *Nutrition and productivity*

Nutritional inadequacy impairs the ability of people to perform biologically (diminishing strength and endurance) and this in turn affects working capacity. Many of the rural poor are engaged in moderate or heavy physical work so that the negative impact of poor nutrition on performance is particularly acute for them.

Figure 1 sets out the links between improved nutrition, greater productivity and higher earnings. Whether and how far improved nutrition will translate into increased earnings depends on social and institutional, as well as nutritional and economic factors, and will be highly context-specific.

## Factors specific to women

Women have multiple roles; being responsible not only for food production and processing but also domestic chores, income generation and care of dependants. Their long periods of often repetitive work can be a source of fatigue and poor occupational health. Further, discrimination, low skills and family care obligations often mean that women's time commands a low return compared with that of men (Lewenhak, 1992). Highlighted below are some of the reasons why women, and subsequently children, suffer from poor occupational health and remain at the bottom of the poverty ladder.

Female workers' physical performance is on average lower than men's because of differences in factors such as muscle strength, cardiovascular function and aerobic work capacity. For these reasons, heavy physical labour such as lifting and carrying, poor working postures, and fast pace of work exposure make women more vulnerable than men to musculo-skeletal problems. Because of their higher proportion of fat, women are more likely to be affected by chemicals such as pesticides and fertilisers which are absorbed through the skin, by inhalation and by ingestion. Further, overexertion and fatigue from working long hours can contribute to prolapse of the uterus and result in spontaneous abortions.

### *Focus on pregnancy*

In the Gambia and Ethiopia it was found that weight gain during pregnancy in the peak agricultural season was only half of that gained during the low season and lower survival rates were detected among foetuses of women operating heavy farm machinery whilst pregnant (Sims, 1997).

The energy used to carry water may consume one third of a woman's daily calorific intake. For pregnant women and mothers of young children, this health impact is more severe; work-related oxygen and calorie consumption can affect the growth of the foetus and the quality of breast milk may be impaired. There is also the risk of miscarriage in the early stages of pregnancy from intra-abdominal pressure and sacroiliac joint strain brought on by carrying heavy loads.

### *Women and nutrition*

The linkages between nutritional status and earnings potential for women are much the same as those discussed in generic terms above, but with two exceptions: first, improved nutrition does not necessarily translate directly into additional availability of work-energy: some may be absorbed by reproductive requirements. Second, widespread discrimination means that higher-productivity work opportunities are likely to be less available to women.

### *Women and technological development*

Agricultural equipment is usually designed to match the physical requirements and capacities of men. Women, by implication, may have greater difficulty in operating it, and

their risk of injury is enhanced. '565 million poor rural women in the developing world are not a burden but rather a tremendous and vitally important force against hunger and poverty. If they have the rights tools, they can plant the seeds for a brighter future' (Rahman, 1993).

## The burden of work related health problems

The burden of work and work-related (occupational and ergonomic) health problems have profound effects on productivity and on economic and social well-being. Many of the health problems faced by people, and especially women, related to agricultural work remain unrecognised and undiagnosed. Even participatory types of appraisal rarely go into the necessary levels of detail, and many people accept occupational health problems as part of life and find it difficult to see them objectively. In particular, the agricultural roles and needs of women are rarely captured in official reports. According to the World Health Organisation (WHO, 1995) ergonomics-related and occupational injuries are third among the causes of morbidity on a global scale. This highlights that illnesses induced by work-related and work generated hazards are significant determinants of the state of world health. In their Global Strategy on Occupational Health For All, the WHO estimate that 40–50% of the world's population are at work-related health risk (exposed to physical, chemical, biological, psychological and ergonomics hazards) and that there are approximately 157 million new cases of occupational work-related diseases each year. This is attributed mainly to injuries sustained from wider use of new technology, use of unsuitable imported machinery and poor working conditions (especially in agriculture and small-scale enterprises). Types of injuries include amputations of limbs, eye wounds, respiratory diseases, pesticide poisoning and musculo-skeletal disorders. This is estimated to amount to an economic loss of 10–15% of GNP in developing countries (WHO, 1995).

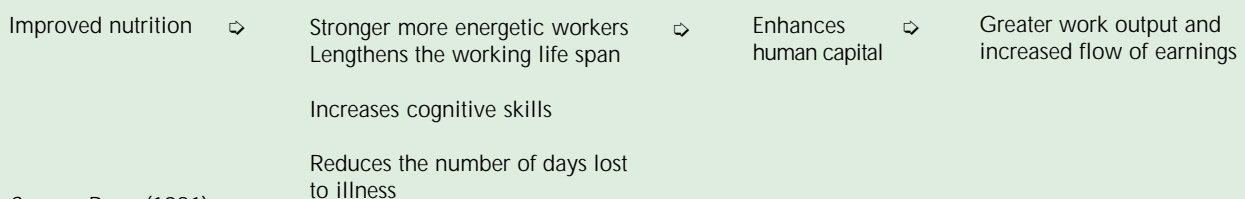
## Reforming the role of the state in ergonomics and occupational health

A number of measures have been proposed specifically to address problems relating to occupational health. There are generally of a regulatory or facilitating kind, and include:

### *Strengthening of international and national policies for improving health at work*

International and national policies and programmes for the further development of occupational and ergonomics (O&E) programmes need to be prepared in partnership with developing country governments. On a national level, critical issues that need to be tackled include development and updating of legislation, education, providing training and information services to employers and workers and development of local O&E services, e.g. via primary health

**Figure 1 Nutrition, human capital and earnings**



Source: Berg, (1981)

care services. However, this enforcement of agreed standards is likely to remain problematic.

*Developing healthy working environments*

The occurrence and distribution of O&E hazards need to be assessed and priority problems identified. Actions should be initiated to reduce or prevent hazards at work such as high risk chemical exposure and unreasonable physical workloads especially for women.

*Raising public awareness and promotion of health at work*

WHO (1995) argue that developing awareness of the need for O&E health among the public at large will influence decision makers, politicians and employers to take practical actions, including guidelines, codes of practice, and so on, for changing the way systems are managed and organised.

*Strengthening and supporting occupational health services*

The WHO argues that to increase the current 5–10% proportion of the working population in developing countries having access to occupational health services possibly through primary health care units will have an important preventative effect.

The major difficulty with all of these proposals is that their implementation – even in the formal employment sectors where it would be fairly straightforward – could place an impossible burden on service delivery and monitoring capacity in practically all developing countries. The informal sector – which includes practically all small-scale farming and most other rural employment – is characterised by unwritten employment contracts, virtually non-existent job security, low levels of unionisation and, in many settings, an excess supply of labour. These conditions are not so extreme in industrialised countries, but, even there, the enforcement of workplace regulations in rural areas remains weak. In developing countries it is likely to be practically non-existent for many years to come.

Against this background, feasible policy options are to be found at general and specific levels: at a *general* level, development policies, projects and programmes can usefully focus on:

- improving nutritional status;
- making available higher-productivity employment opportunities;
- reducing the amount of time spent in low or near-zero productivity activities.

In the latter two cases, particular attention should be given to the specific needs of women, and to counteracting where possible any discrimination against particular groups (including women) inherent in traditional socio-cultural norms.

At a *specific* level measures can usefully be taken to improve the design of equipment and machinery used in farming and in related activities. This should be done with regard to:

- improving efficiency;
- improving health and safety.

Any new (or re-) design should be user-friendly and gender compatible but should take into account not only the fact that maintenance is likely to be minimal, but also that instructions (and their enforcement) in respect of operator safety are likely to be minimal. As far as possible, the scope for error in this respect should therefore be 'designed out'.

*Addressing the particular needs of women*

Enhancing the capacity and capability of women as major contributors to food production needs careful consideration. Women's ability to produce food and achieve better health can be enhanced in a number of ways:

- improving control of and access to productive resources such as credit, agricultural inputs, and markets;
- improving access to resources such as fuelwood and

**Table 1 Organisation involved in promoting the need to invest in the human capital via ergonomics and occupational health programmes**

Organisation	Mission statement	Nature and scope of operation	Relevance to ergonomics and occupational health
International Labour Organisation	Raise working and living standards throughout the world.	Setting international standards. Employment and development training.	Ergonomics considered under the occupational health and safety programme, PIACT initiative (International Programme for the Improvement of Working Conditions and Environment), WISE (work improvements in small enterprises), Ergonomics publications.
Food and Agriculture Organisation	Raise levels of nutrition and standards of living, improve agricultural productivity and conditions of the rural poor.	Technical advice, information. Agricultural policy development.	Sponsors of ergonomics research. Ergonomics publications.
World Health Organisation	The attainment of all peoples of the highest possible level of health.	Assist governments in strengthening health services. Promote improvement in economic and working conditions. Dissemination of health related information.	Ergonomics considered under the Occupational Health for All Strategy.

Source: McNeill (1999)

- water and so helping to economise on women's time;
- control of economic assets;
- improving access to health care facilities to raise the health status of women;
- providing education and training for simple and immediate care of injuries;
- improving access to services and information including education.

## Conclusions

The Rio Summit Declaration stated that 'human beings are the centre for sustainable development. They are entitled to a healthy and productive life in harmony with nature'. One implication of this is that people ought to be able to live and work in an environment and use equipment and production processes that will not cause danger to human health. Health insurance is generally absent in developing countries, so that family well-being depends heavily on income generated by the working members.

At present there are a number of organisations actively involved in promoting the need to invest in human capital via ergonomics and occupational health programmes in developing countries. They seek to promote health and safety, and raise standards of living. The roles and responsibilities of these organisations are summarised in Table 1.

DFID is presently the first bilateral donor to introduce ergonomics in its projects and programmes in the context of seeking to improve the lives of poor people and enhance the sustainability of their livelihoods. Ergonomics can contribute towards this by encouraging re-assessment of the relationship between workers, equipment and the working environment. This offers the prospects of reducing the vulnerability of poor people, and helping to identify areas in which the human capital can most appropriately be developed in relation to the working environment.

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