

## **SUSTAINABLE DEVELOPMENT OF HUMAN RESOURCE CAPITAL**

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**Keywords:** Basic needs, capital accumulation, children, crime, developing economies, economic scarcity, education, gender, human resource capital, inequality, population, sustainability, technological progress, women.

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### **Summary**

Human resources are central to economic development and can be increased in value and productivity by investment in human beings e.g., in their education and health. But for a considerable period in the past, economists stressed the importance of the accumulation of human-made physical capital for economic growth and development to the neglect of human resource capital. Nevertheless, in the second half of the twentieth century the importance of human resource capital (particularly education) for economic growth came to be recognized. However, the implications of the formation of human resource capital for sustainable development were given virtually no in-depth attention, although it is important to address this matter, as is done here.

The article outlines the nature and broad categories of capital, with particular attention given to human resource capital. While the formation of human resource capital can support sustainable development, it also poses a challenge, since this “formation” draws on or transforms natural resource and environmental capital. Using a neo-Malthusian model, direct routes by which investment in human resource capital may promote sustainable development are outlined. Both improved education and health are likely, for example, to reduce population growth, and this is likely to have favorable consequences for sustainable development. Despite this, it must also be recognized that difficulties (some of which are outlined) exist for sustainably developing human resources. It is argued that greater equality in the distribution of human resource capital, both within nations and globally, would make a significant contribution to sustainable

development. The 'basic needs' approach has considerable merit both from the point of view of justice and as a contributor to sustainable development.

## **1. Introduction**

Human resources play a central role in economic development—they are the driving force behind it, and from an anthropocentric viewpoint, the purpose for it. Economists, however, have been ambivalent about how human beings are best considered as an economic resource. One way to view human populations is as a capital stock. It is a stock which can be improved in value and productivity by investment, e.g., via education, but this investment is embodied in individuals.

The importance of investment in human beings as a source of economic growth, even though recognized by Adam Smith, and other pioneering economists such as Alfred Marshall, as a significant contributor to development, did not gain prominence in contemporary economics until the second half of the twentieth century.

Prior to this changed emphasis, neoclassical formal growth models were developed which portrayed quantities of human-made capital and labor as the major factors contributing to economic growth. In such models, natural resources (land) and human resource capital played no specific role. In contrast, both natural resources and technological progress were considered to be important factors in economic development in the theories of most classical economists. Subsequently, Solow (1957) and others introduced technological progress into these models as an exogenous variable, but natural/environmental resources were not introduced.

A change in viewpoint about the importance of human resource capital occurred partly as a result of the empirical analysis of the sources of economic growth (Denison, 1962). Denison found that in more developed countries (e.g. the US), the major portion of recent economic growth could not be attributed to increases in the quantity of capital and labor, but was due to improvements in the productive quality of these as a result of technological progress and education, respectively, as well as other factors such as the extension of markets. Education to a large extent involves an addition to human resource capital (HRC), and technological progress may also depend significantly on education.

New growth theories such as those developed by Romer (1990) put major emphasis on education, technical knowledge, and economies of agglomeration and scale as contributors to economic growth, but they fail to take account of natural and environmental resources as possible constraints on growth. Therefore, they ignore the sustainability issues raised by neo-Malthusians.

Even though HRC has been widely recognized as a potentially significant contributor to sustainable development (SD) and to be highly relevant to management, there has been little analysis of the interrelationship between the HRC and SD. The purpose of this article is to explore this interrelationship. This will involve a consideration of the nature of capital and HRC, a definition of SD for the purpose of this analysis, and an outline of the influences of HRC on the achievement of SD. Furthermore, consideration will be

given to problems of sustaining and developing human resource capital and to ways of more effectively and efficiently using the world's HRC to achieve sustainable development.

## **2. The Nature of Capital, Especially Human Resource Capital**

Classical economists divided productive resources into land (consisting of all natural nonhuman resources), labor and capital. Alfred Marshall added entrepreneurship to this list. Traditionally, capital has been defined as the produced means of further production. Originally, economists mainly had relatively durable human-made physical commodities in mind, such as machinery. Capital accumulation of this type (supporting industrialization) was seen by Karl Marx as the wellspring of economic growth. Even though Marx objected to the distributional consequences of capitalism (a free market economy), he saw capital accumulation as the main means to reduce scarcity. His hope was that the process of capital accumulation would be organized under socialism to yield a more acceptable distribution of human welfare. Marx was never in doubt about the importance of capital accumulation as a means of achieving economic growth and increased material prosperity—a lesson not subsequently lost on Joseph Stalin and Mao Tsetung. But this view has not gone unchallenged in recent times. Neo-Malthusians have raised doubts about the long-term effectiveness of this strategy for reducing economic scarcity.

But what, and what is not, capital is far from clear. For example, seed for replanting and stocks of domesticated animals can be regarded as forms of capital even though they are produced by much more than the contribution of humans. Indeed, they are a form of renewable resource stock. Most stock resources (natural and otherwise) have similar properties to capital as traditionally defined by economists. From a sustainability point of view, it is useful to divide resources into stock and flow resources.

A human population is a renewable stock resource and in many respects satisfies the traditional definition of capital—humans are produced means for further production. This relationship can be quite direct as in a subsistence economy. For a subsistence family, children can be an important means for sustaining production by the family.

It is useful to look upon human beings as possessing many of the qualities of “human-made” capital. Like machines, human beings are subject to wear-and-tear, have a limited life, and from an economic point of view, can become obsolete. Like machines their productivity can be augmented in various way e.g., by embodying skills and “knowledge” and by increasing their robustness. Investment in humans, such as in their education and in their health and physique, can add significantly to their productivity. Such investment increases human resource capital.

When an earlier version of this paper was presented at Rabindra Bharati University in India, one professor expressed moral concern that human beings should be regarded as capital. But this approach is not intended to convey the view that individual human beings are equivalent to inanimate capital. They are not. Human beings possess many qualities not possessed by such capital, have a soul, and command intrinsic value in

themselves. For different purposes, individuals need to be seen or modeled as different entities.

The relationship between education and human productivity is a relatively obvious one and has been given the greatest attention by economists. But investment in human health may also be of considerable importance. This includes investment in social health, such as in improved water and sanitation systems. The latter involve a physical component but assist with the health of individuals and development of children. Indeed, in relation to the development of children, items which appear on the surface to be consumption items, may be more appropriately considered as investment items. This includes adequate and nutritious food for growing children, and their access to safe water. Unfortunately, many children today are still denied basic needs in developing countries, and there are significant pockets of poverty in more developed countries as well. The incidence of poverty amongst children has risen in many economies in transition, e.g., in Russia. The impoverishment of children, and their lack of access to basic education and health services, limits the value of human resources.

Of course, the worth of individuals is not to be judged purely by their productivity and their embodiment of human capital. The author accepts the view that all individuals are intrinsically equal in the sight of God. Investment in human beings helps individuals to realize their innate potential. But not all that potential needs to be used for economic purposes. For example, education is not solely, and should not be solely, be undertaken for production purposes. It is also an important vehicle for the transmission of social values and culture. But even in this respect, education helps to sustain social and cultural capital (the social fabric), which itself can help to sustain economic activity. Nevertheless, as Raj Kumar Sen (2000) points out, “the productivity of human beings should be judged in the broader perspective of the quality of life and not in the narrow economic sense only.” Human development should not be evaluated solely in terms of narrow increases in productivity.

### **3. Human Resource Capital and Sustainable Development**

There are many definitions of sustainable development. Thus a variety of concepts exist. Here, the economic definition is adopted that sustainable development is development ensuring that the income (or standard of living) of future generations is not less than that of current generations (Tietenberg 1988). While there are some difficulties with this concept, it provides a convenient starting point conceptually. It would, for example, be satisfied if per capita incomes continued to grow, even if slowly, with the passage of time. This would be a situation of perpetual economic growth.

Optimists believe that sustainable development is possible provided sufficient human-made capital is bequeathed to future generations. Human-made capital is seen as a suitable bequest for future generations. Optimists also believe that technological progress will help to realize sustainable development. Basically they foresee no problem in continuing to transform the available natural/environmental resources stock or capital into human-made capital and other commodities. Their requirements concerning human capital are less clear, but it appears that they also see the maintenance and increase of this capital as important for sustained economic growth (as, for example, expressed by

the World Bank), but they are less clear about how this is to be best realized. For instance, under structural adjustment policies, greater weight is being placed on free markets and user-pays as a means of providing education and health services—mechanisms which may have an adverse impact on the access of disadvantaged groups to these services.

Furthermore, optimists continue to place great hope in continuing technological progress as a means of reducing economic scarcity. But technological progress does not arise from thin air. Propitious conditions for it need to be maintained. To some extent, advances in scientific and technological knowledge require high levels of skills (education) and other investment. But additional conditions also need to be satisfied, such as a social atmosphere and rewards supportive of creativity and innovation. Only once there can be assurance that the conditions for continuing technological progress will be satisfied, can there be a high level of confidence in the position of the optimists who support weak conditions for SD, who argue that SD will result from economic growth made possible by accumulating human-made capital and transforming natural resource stocks into human-made capital.

The contrasting more pessimistic view, is that further conversion of natural resources into human-made capital is liable to endanger SD. Neo-Malthusians believe that the growth optimists are too ready to assume that human-made capital can continue to be substituted for natural resource stock so as to achieve SD. Natural/environmental resource capital also has a productive value. Depletion of this stock by converting it into human-made commodities (including human-made capital) will eventually reduce productivity and incomes as an imbalance emerges between human-made capital and natural resource capital. So neo-Malthusians are wary about the conversion process and argue that the production of more human-made capital at the expense of natural resource capital is not necessarily a suitable bequest for future generations. At the very least, they wish to restrain the conversion process. They maintain that a cautious stance is required, given the amount of natural resource conversion or substitution already completed. Thus, this group wishes to place strong conditions on the conversion process in order to achieve SD. Human resource capital is a form of man-made capital, and all additions to human resource capital usually involve some use and transformation of natural resources. Hence, the sustainability of investment in human capital depends to some extent on the conservation of natural resources. Furthermore, care needs to be taken to see that economic sustainability is maintained and not undermined by additions to HRC. The production of HRC is by no means a “free lunch” from several different perspectives, even though it is often a worthwhile investment.

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### **Biographical Sketch**

**Clement Tisdell** has been Professor of Economics at The University of Queensland, Brisbane, Australia, since 1989. His fields of research include ecological and environmental economics, development economics, tourism economics, socioeconomic aspects of gender, science and technology policy, as well as selected microeconomic issues. He has published almost 600 articles and more than 50 books. His articles have appeared in international journals such as *Annals of Tourism Research*, *Ecological Economics*, *Environmental Management*, *Biodiversity Conservation*, *Econometrica*, *Oxford Economic Papers*, *Contemporary Economic Policy*, *Journal of Mathematical Economics*, *Weltwirtschaftliches Archiv*, *International Journal of Social Economics*, *Review of Social Economy*, *Prometheus*, *Sustainable Development*, and *World Development*. He is President of the International Association of Aquaculture Economics and Management and coeditor of its journal, and member of the Economics Society of Australia. He has held several university administrative posts and has acted as consultant to national and international bodies. He is Chairman of the consulting company TEMTAC Pty Ltd.