

Guest Editorial

Work and Sustainable Development

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The aim of the six papers published in this section “*Work and Sustainable Development*” is to document investigation or research addressing work activities in relation to sustainability. Previous special issues on ergonomics [1–3], and previous papers published in this journal [4, 5] have reflected how sustainability and sustained development impact the field of ergonomics and human factors. However, human work has tended to be overshadowed by the environmental and economic dimensions, and one could argue that work is the great forgotten dimension of sustainable development. From that point of view, it is pertinent to recall briefly how the notion of sustainable development first appeared.

Ideas about sustainable development stemmed from a critique of the concept of development, primarily understood as “economic growth”, where economic development was to a large extent believed to consist of progressive and necessary stages [6]. Yet at the beginning of the 1960s, some doubts began to arise. They emphasized the importance of taking into account both social change and institutional requirements (in addition to the growth of production and income). The role of education, “human capital”, and policies for basic sanitation became legitimate issues at the United Nations and its financial institution, the World Bank. In this context, there was talk of “*integrated development*”, aimed at articulating economic development to social and local/regional planning.

During the 1970s, ecological concerns appeared: development in the South was having severe environmental consequences (degradation of resources,

biotypes and soil quality, and reduced biodiversity) due to the inappropriateness of Western technologies and unfamiliarity with local populations’ aims, priorities, and cultural references [7]. This environmental deterioration in itself became an obstacle to improving the situation and the living standards of the most disadvantaged populations. In parallel with these concerns on the ecological impact of development, there was another debate, in the form of a worldwide alert: on a global scale, the continuation of human economic and demographic development was becoming untenable. “*Limits to Growth*” was the title of the Club of Rome’s 1972 report [8].

In light of these representations tinged with catastrophe and radicalism, some economists (Gunnar Myrdal, Amartya Sen, Colin Clark, and Karl Kapp, among others) wanted to come up with strategies to articulate environmental protection to economic and humanist objectives, by profoundly reorienting priorities. This movement, named “eco-development” [9], promoted four key ideas. First, an approach that considers human activity only as a disturbance of the natural environment is indefensible and politically unrealistic. Second, development should be grounded on meeting the basic material and non-material needs of populations – and not only on economic returns and demands for solvency. Third, as technological choices are the key variables in harmonizing society and nature, the aim must be to adapt technologies to the social and natural features of different regions, rather than trying to adapt resources and populations to technologies invented for and by the developed Western world. Technological applications must be developed specifically for their local context. Finally, development cannot result only from market mechanisms; it implies the need to involve and coordinate the populations concerned, and it requires that mar-

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ket mechanisms be related to both the conception and the use of development instruments and practices.

Because the “eco-developmental” approach was probably too radical to be supported by the major Western countries, it was criticized and opposed in the mid-1980s. It was finally the notion of “sustainable development” (initially introduced by the IUCN, and reused in the report by Mme G. H. Brundtland in 1987), that came under the spotlight. As we well know, sustained development is based on a triad: “social equity” (development should be linked primarily to meeting the basic needs – material and non-material – of populations), “environmental sustainability” (due to the very negative consequences of economic development on the natural environment), and “economic viability” (environmental protection needs to be considered within a more global context of growth and economic development).

It therefore appeared clearly that the questions and issues surrounding the notion of sustainable development could not be reduced to economic and environmental ones. As the social dimensions of equity and work (explicitly highlighted in the Brundtland Report as a human need), constituted a strong pillar of sustainable development, they were legitimate issues. International bodies insisted on these dimensions. In 1998, the International Labor Organization (ILO) defined “fundamental norms of work”, which it subsequently reiterated. The concept was taken up again in 2007 by the UN under the concept of “decent work”, which, in addition to respecting the fundamental norms of work, also covered the conditions in which work is performed.

But human work remains the great forgotten dimension of sustainable development, its “weakest pillar” behind economic and environmental issues. Based on a literature review of the link between sustainability, occupational health problems and working conditions, Mayer and Colleagues (this section) discuss this issue. Their review shows that ergonomics is helpful and appropriate to determine the mismatch between people capacity and system demand (although there is a lack of empirical information to prove that potential). They note, however, that while many organizations have made enormous efforts to reduce their ecological (environmental) impact, but not many have endeavored to reduce the impact on their own workers.

Understanding why social equity and working conditions appear as a secondary dimension of sustainable development is probably a key question for ergonomics and HF specialists concerned by

sustainable development. Clearly, economic growth is usually seen as the only means of improvement in the social and environmental spheres. This perspective is moreover often promoted in the countries of the South, where poverty is considered as the primary threat to the environment. Yet the underlying assumption is that economic growth is put at the service of the people’s needs. Is this actually the case? This is an exciting question, but one that goes well beyond the scope of this special section.

From our point of view, if we are to cast aside a line of analysis focused on the predominance of economic over social considerations, we need above all a better understanding of the links between work and sustainable development. For the moment, these links are not sufficiently well defined, and need to be identified more clearly. Economics approaches tend to be limited to seeing development essentially as something that can be measured: economic growth, profits, competitiveness, and at best efficiency, rather than what matters to people and is experienced at work. Ergonomics, as a science dealing with physical, cognitive, social and organizational aspects of work, is particularly interested in such questions. The collection of papers published in this special section seek to better document work activities within the context of sustained development, from the point of view of the workers.

Mendes and colleagues document the link between sustainability of work and occupational health in the mining industry of Espirito Santos (Brazil). In order to reduce work-related lung disease (pneumoconiosis) due to dust inhalation, new technologies are being introduced in the mines. The article documents how this appears as an innovation that is triggering a systemic change of work activities. This change, described as a “systemic appropriation”, is affecting not only tasks and activities, but also work organization and production strategies. Lima & Oliveira document the activities of waste pickers in the region of Belo Horizonte (Brazil). These are marginalized people of the labor market, who collect waste on either a continuous or a temporary basis. The article shows how they have developed a sustainable mode of production, combining economic viability with social and environmental criteria in an innovative and fair production technology. Coquil and colleagues analyze the process whereby farmers change and transform their own work, to shift from an intensive mode of production to a self sufficient and autonomous one. Using the concept of “*monde professionnel*”, the paper

shows that farmers must change their instruments, knowledge, values and finally the object of their work. Laura Seppänen also documents sustainable development in organic vegetable farming as a process of change and development that implies a learning process. Focusing on cultural- historical activity theory, she discusses methods that can be used to support such a developmental process. Bittencourt and colleagues likewise methodologically document this process, but within the design process of a work setting. They seek a method that can be used to support a constructive process of work experience in order to develop new ways of working, with more safety and efficiency.

All together, these articles depict a singular complexity encountered by workers with regard to sustainability. In a context where we cannot continue along our current path, sustainability appears as something to be done and constructed at work, through workers' activities: their understanding, their creativity, and what counts for them. And there is no single path. This is not a problem of application of ideas, models or principles. To the contrary, it appears as a question of change and development within an unknown space of new possibilities to be revealed through lived experience, where political dimensions of living together, technical possibilities, and values are constantly called into question – and are sometime resolved through and by work. From that point of view, it appears necessary to seriously examine current forms of change and design processes. The questions on how the actions producing change are constructed and driven are not new in ergonomics,

and even sum up old themes such as, for example, participatory approaches. But sustained development is an urgency, one that obliges all of us to (re)consider the role of work and workers as human actors – and not only human factors.

We hope this collection of papers will stimulate future research and practice in a field that is of primary importance for the future of human beings.

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