

NOTES

Work-Related Research, Education, and Training in Developing Countries

Rabiul Ahasan
Daniel Imbeau

Department of Mathematics and Industrial Engineering,
École Polytechnique de Montréal, Canada

Work-related research, education, and training (WRET) have not been widely recognised in many developing countries (DCs) as the most important factor for sustainable workplace improvement. There are many reasons why WRET is still neglected or remains unrecognised. Empirical research, advanced studies, and training abroad do not seem to be cost-effective for many people living in DCs because of enormous obstacles. Therefore, it is not easy to demonstrate that WRET result in workplace improvement in diverse situations in each DC. Taking into consideration poor health and safety in various workplaces, this paper aims to stimulate critical opinions and discussions on WRET, which are yet to be given high priority in the national agenda to ensure industrial production and social progress.

work-related issues ergonomics vocational skills job training third world

1. INTRODUCTION

Workers in developing countries (DCs) represent large proportions of the global workforce, but they receive little attention. Work-related issues in many parts of the world are yet to capture media attention (Holkeri, 2001). Most workers in those regions are unskilled and poorly educated but they are employed in jobs involving manual materials handling or handling hazardous materials (Ahasan, 2001a). Many studies (Christiani, Durvasula, & Myers

Correspondence and requests for offprints should be sent to Rabiul Ahasan, Department of Mathematics and Industrial Engineering, École Polytechnique de Montréal, Campus de l'Université de Montréal, C.P. 6079, Succ. Centre-Ville, Montréal, Qué., Canada, H3C 3A7. E-mail: <rabiul.ahasan@polymtl.ca>.

1990; El-Batawi, 1981; Elgstrand, 1985) have confirmed that workers are not able to perform their duties due to ignorance, illiteracy, and noncompliance with work regulations and labour legislation (WRL). Industries are often established in unregulated or congested spaces because small factory owners or new entrepreneurs in DCs do not usually follow WRL (Ahasan, 2002). There are very few examples of ergonomic workplaces in DCs (Phoon, 1983). Any change in workplaces or improvement of the layout is treated as expensive, a matter of time and production loss. As a result, many workers in DCs are suffering from various types of work-related injuries (Mohan, 1987), accidents, and illness symptoms (Table 1).

TABLE 1. Occupational Injuries (Including Fatal Cases) in Different Regions of Developing Nations (International Labour Organization [ILO], 1996; Takala, 1999)

Regions	Workers Employed (in m)	Fatalities (F _r • WE)	Fatality Rate (F _r /10 ⁵)
Asia (selected countries)	339,840	80,586	23.10
the Middle East	186,000	41,850	22.50
Sub-Saharan Africa	218,400	45,864	21.00
Latin America and the Caribbean	195,000	26,374	13.50
China	614,690	68,231	11.10
India	334,000	36,740	11.00

The number of workers exposed to work-related problems (WRPs) may be much higher than expected because they do not report actual problems to the concerned authorities. State-owned industrial units are not profitable due to frequent labour strikes and high energy costs, mismanagement, and so forth. In the name of investing capital and machinery, many private entrepreneurs or industrialists are taking loans from various banks but they invest money somewhere else. And thus, some entrepreneurs become defaulters from commercial and industrial banks. Under-invoicing and over-invoicing is a common practice in many DCs.

WRPs are not identified on the basis of exposure-disease association (Cullen & Harari, 1995) because students, researchers, or professors do not have much opportunity for conducting extensive field surveys. Field studies and walk-thorough investigation are not designed in the direction of application-oriented research. It is, therefore, not easy to investigate workplaces and gather data and information. Industries do not usually record accidents or injury cases because of fear of penalties or compensation. In some countries, injury data, causes of work-related illness, or compensation figures are not compiled in a register according to International Labour Organization (ILO)

or World Health Organization (WHO) guidelines. Computers are perhaps available in government offices, but recording systems may not classify according to type and causes of work injuries. Workers are not usually recruited and paid in accordance with work regulations or national legislation. If such situations continue, WRPs will increase rapidly and will affect everybody (Annan, 1997). Rantanen (1989, 1994) emphasised the current status and priorities of work-related research that should be enhanced for the prevention of work-related diseases. Rantanen (1997) also explored issues for enhancing occupational health and safety training for workers as part of life-long education.

2. WORK-RELATED STUDIES AND TRAINING

Many educational institutes do not have programs in industrial medicine, toxicology, occupational health, work safety, or industrial hygiene. There is a shortage of equipment, computers, and laboratory facilities at university-level educational institutes. Some educational institutes may have teaching programs in health, safety, and ergonomics (HSE) but students do not have much opportunity for improving their skills in workplace design, for instance. Work-related manuals or video-based materials (Fernau, 1981) on work safety, occupational health, and industrial hygiene are rare. Work-related journal articles, newsletters, and periodicals are limited because these are not subscribed to by all universities and industries. University professionals may conduct some research and studies in some countries but their results do not contain facts and figures. Most review materials prepared by the ministries concerned are neither qualitative nor quantitative. Government officials usually publish annual reports from nonresearched investigations. It has also been identified that professionals write research articles avoiding practical suggestions. Very little research and very few studies have been conducted from the level of epidemiological tests and laboratory experiments. In many instances, researchers and academics read books that contain western data and information that may not be easily implemented (or applicable) in DCs. There have been no “before” or “after” studies on the specific topic of HSE. However, some research papers can be found through a MEDLINE search (www.kfinder.com; retrieved October 18, 2002) analysed with simple statistics (Rahman, Laz, & Fukui, 1999).

As far as education and training in foreign countries are concerned, an applicant living in DCs usually needs an official permission. Issuance of a permission like that is a lengthy process due to extreme bureaucracy in high-

level offices. Every participant needs to fill out an extensive form, where sensitive questions are to be answered. Therefore, many applicants suffer from acute frustration when attempting to obtain departmental permission for higher studies. Until an official has had at least 5–7 years of experience in the same job, financial and administrative support is not easily available. A high level of competition also prevails for funded research and training abroad. In many instances, senior-level officials or top-level administrators get the opportunity and achieve grants. Many of them have no contact with poor workers, whereas those concerned with workplace improvement may not have the energy or willingness to achieve higher education or foreign training.

A mid-level manager, foreman, or young supervisor rarely have the opportunity to participate in foreign programs because there is a high level of persuasion and lobbying from top-level officials or politicians. Students from some countries are unlikely to obtain entry permission or a visa from an embassy of a western country (e.g., a Libyan or Sudanese going to the USA). The situation is similar for a Taiwanese going to China or a Pakistani wishing to go to India. Some countries have stringent regulations due to perhaps political conflict or other reasons (e.g., Mozambique and the UK, Iraq and the USA, Eritrea and Ethiopia). Diplomatic relations between some countries may be unfavourable for conducting empirical research and higher-level studies.

3. TRAINING INSTITUTES

Training centres are rarely established at regional or rural districts in DCs. Training courses on work-related issues are not frequently offered in divisional headquarters (HQs), whereas job training is of prime importance for local workers. In many instances, training programs are organised for institutional development instead of regular sessions on health, safety, and ergonomics. It is of no surprise that on many occasions a political meeting or a get-together party is held in the training centre. Rural participants can also have considerable difficulties in attending training courses in divisional HQs. People who work in small and medium-sized enterprises are believed to be in real danger at their workplace (Ahasan, 2002). Training courses sponsored by international organisations (e.g., ILO, WHO, United Nations Development Programme [UNDP]) and other aid agencies (e.g., JICA, CIDA, SIDA, FINNIDA, DANNIDA) are usually held in regional HQs but they are far from the reality of sustainable workplace improvement in rural areas. A Nordic Institute for Advanced Training in Occupational Health and Safety

(NIVA) course in Stockholm, Sweden, was arranged especially for work-related issues in DCs, for instance. A Course Report (1993) revealed that 80% of the participants felt that the theoretical level for specific requirements was “just right.” In all, 82% participants opined that the NIVA 1993 course was not suitable for solving real problems. Only 8% participants felt that the applicability and practicability of this course was “high” for specific work requirements in the diverse situations in each DC.

A lecturer (trainer, guest lecturer, teacher) is usually invited from a local university. He or she provides lectures based on textbooks where western-based ideas on complex safety systems, for instance, are printed with nice pictures and flow diagrams. Some lectures are confusing or inappropriate in the context of workplace improvement. Lecturers do not have in-depth knowledge on work-related and regulatory issues in individual countries or regions. Labour union activities, socioeconomic and political factors are different in different countries. If the theme of the training courses is based on theoretical concepts or nonresearched contents, then grass-roots improvement is not possible. In some cases, training sessions are identified merely as a theme for only arranging a meeting rather than enhancing health, hygiene, or safety measures in different workplaces.

Affiliated with a western university or an international aid agency, some research institutes, called centres of ergonomics, have seen established to enhance work-related research, education, and training (WRET). The image of these centres is appealing (Abeysekera, 2000a, b) because lecturers are invited from around the world. However, students may not learn much in many of those centres because guest lecturers (invited mainly from western countries) may have an unclear concept on the current situation in DCs. Many of them do not know how difficult it is to implement work regulations and labour legislation in each DC. Some lecturers may lack up-to-date knowledge on practical improvement features with regard to the existing situation in DCs. However there are many success stories on launching WRET in DCs (Shahnavaz & Abeysekera, 1991).

With their greater expectations of life, students get admitted into western educational institutes through both scholarship and self-financing. They are from a wide range of educational backgrounds such as psychology, physiotherapy, engineering, or medical science. Most residence permits or entry visas are issued for postgraduate students, research assistants, docents, and so forth, but western colleagues recognise them as *upgraded refugees*. This is so, because they came from poor nations and many of them start processing applications for economic migration to get advanced training and to do

research. It is not surprising that they cannot get recommendations from directors or professors to find a job in the western labour market.

There are certain reasons why many of them are not willing to go back and get involved with the practical improvement of workplaces in DCs. The main reason is that health, safety, and ergonomics (HSE) are still to be recognised or are hardly practised in DCs. And it is very difficult to have an opportunity to utilise health and safety knowledge and ergonomic skills for sustainable workplace improvement. Many of them do not get an appropriate job in their country of origin. Therefore, it is unlikely that they will utilise their advanced knowledge for their own country. This causes depression and frustration. If someone returns from a western country after higher education and training, he or she does not like to work in a place where poor workers are involved in strenuous tasks, wearing dirty clothes. If they join the same work organization or company, the salary and other job benefits are still poor. However the salary and other job benefits are paid according to the national pay scale that will not satisfy them—as they feel proud of their higher education and training abroad. There may be jealousy from their colleagues because their colleagues have not had foreign training like theirs. Thus, a young scientist educated and trained in a foreign country ends up in another job either in non-governmental organisations (NGOs), or becomes involved in a private practice or consultancy business, or leaves the country for a western destination.

4. WORKSHOPS AND CONFERENCES

International workshops are attractive when people from various disciplines attend the meeting. However, the symposiums, workshops, and conferences that are convened in many places every year hardly benefit the poor workers in DCs. Very few participants are able to attend these conferences due to lack of money or bureaucratic procedures related to getting permission to travel abroad. If someone is sponsored, a suitable candidate may not be selected for attending the conference or workshop. A mid-level manager or a foreman involved in workplace improvement has no opportunity to attend such a seminar or conference. The knowledge on HSE, hence, may not pass to the general workers at risk.

As far as experts are concerned, it has often been observed that senior professionals do not usually note important topics raised by young participants. The speaker becomes stressed when looking for a correct answer, or reacts strongly if any practical question is asked, for instance, “What is the basis for

sustainable workplace improvement in DCs?” or “How should HSE measures be implemented in practice?” A senior scientist may not be aware of his or her proud feelings, he or she has given a keynote lecture that is perhaps a masterpiece. It does not usually stimulate practical knowledge on the facts and findings for workplace development but it does matter when his or her speech on work-related issues has no end benefits in diverse situations in DCs. Therefore, a theoretical thought expressed in a conference speech may not be useful in solving the ever-increasing problems in many DCs.

Selected members of the International Commission on Occupational Health (www.icoh.org.sg, www.occuphealth.fi/e/icoh; retrieved October 18, 2002) from every geographical region usually attend conferences as regional or country representatives. Maintaining conference conventions, sophisticated posters are presented on various issues of HSE but they perhaps lack holistic views on sustainable workplace improvement. Some of them are invited and sponsored by the International Ergonomics Association (IEA) or the Human Factors and Ergonomic Society (HFES) because special sessions are arranged for DCs. These sessions may end up with no solutions. Many conference participants realise that HSE are in fact far from the reality of what is discussed in the conference room, which is air-conditioned, noise-proof, and in a no-dust environment.

People from various disciplines are involved because WRET are multi-disciplinary. It is of no wonder that an epidemiologist does not usually care about holistic views presented by an ergonomist. Occupational therapists' ideas may be confusing for psychologists. On occasion, a kinesiologist believes that human factors engineers or ergonomists are too theoretical in the way they express their expert opinions.

During HFES Annual Meetings, most participants are professionals from western countries—those experts may have little knowledge or no skills related to WRET in DCs. Some important members of IEA or the American Industrial Hygiene Association have settled in western countries but they originally came from DCs. It is a pity that they have no time to deal with the ever-increasing problems in DCs. Simply, many of them are not interested in their country of origin because they have already changed their nationality and they have obtained new passports. They may have little contact with their country of origin considering it perhaps a dirty task (!). It is believed that co-operation with local government authorities of poor nations is not easy because there is a lot of bureaucracy.

Participants from DCs can be shy and afraid to discuss work-related matters with a senior ergonomist. The sophisticated behaviour of senior

ergonomists can make some participants feel uncomfortable or bored. Others are confused about what others will think about their poster presentations. Still others perhaps suffer from inferiority complexes related to their poor English skills during oral presentations. If they are new to the profession, they might not understand expressions like “a holistic approach to sustainable workplace improvement,” for instance. It is not unusual for a participant from a DC to recount only work-related problems (WRPs) instead of finding low-cost ways of ergonomically improving existing systems. Many may avoid important sessions on “the ergonomics of user-satisfaction,” due to perhaps pressures of satisfying the accompanying person, if any. So, they go back home with a lot of papers, posters, and books of proceedings, only useful for decorating the bookshelf.

5. INSPECTORATES

The role and responsibility of inspectorates (Bold, 1996; Khamis, 1992; Lukindo, 1991; Saxena, 1997) is vital for combating WRPs. Inspectorates may have some knowledge on the general health and safety but public health officials in DCs may wonder whether ergonomics is a method, a measure, or a tool. It is very difficult to define the main tasks of the officials concerned and the role of regional centres because each country has a different administrative system. Officials become stressed when international organisations (ILO, WHO, or UNDP) require work-related data and information to compile national statistics. It takes months to get any information from a Department of Labour, for instance. The offices concerned may not have data organised according to the types and categories of injury cases defined by ILO or WHO. Qualitative field surveys and systematic workplace analyses are lacking in many countries. The management of both private and state industries does not record work-related accidents or injury cases because of fear of penalties or compensation. Factory inspectors seldom inform workers of risks and seldom take appropriate precautionary measures.

6. INTERNATIONAL ORGANISATIONS AND NGOS

There is a lack of co-operation and collaboration among universities, NGOs, regulatory bodies, and local government authorities. There may be very strict regulations for obtaining permission to conduct WRET because the vital channel of communication is seldom maintained among all the parties con-

cerned. Very few NGOs are active in WRET but many are involved in socio-economic or rural development projects. Financial support from NGOs and international organisations for enhancing technical education and vocational training is low. The ministries or departments concerned may have some funding but there is usually very little effort when creating skill development programs, for instance. International development agencies (e.g., Oxfam, CIDA, SIDA, FINNIDA, DANNIDA, JICA) seldom allocate funds for collaborative research and training (Kogi, 1998; Kogi & Kawakami, 1997) whereas this is very important for sustainable workplace improvement in DCs.

Funds for WRET are not factored into the national budgets of DCs due to other pressures in the economy, corruption, and political chaos. In some countries, little more than 0.5% of the Gross National Product is spent on WRET (Ahasan, 2001b). Some NGOs, universities, polytechnics, or other educational institutes have some facilities but they are not much interested in WRET. Bureaucracy, poor transparency, and corruption can also be involved in collaborative research, education, and training. The key management of a foreign-aided research centre (www.wider.unu.edu, retrieved October 18, 2002) had to leave the job because of the corruption involved in advanced research and training.

7. DISCUSSION

WRET is concerned with the enhancement of workers' health, safety, and well-being; prevention and control of work injuries; as well as with environmental protection. It is, therefore, very important to know how these can be developed in practice in each region in DCs. WRET will never be successful if grass-roots improvement is not planned in co-operation with key persons (Ahasan, Quddus, & Mohiuddin, 1998; Partanen et al., 1999). WRET will never be successful unless professionals, academics, factory inspectors, and public health officials are innovative and they excel in practice. WRPs will never be reduced substantially unless regulatory actions are implemented strictly by inspectorates. Proper communication should be established through consultation, guidance, and negotiation and appropriate goals. Preventive measures (e.g., health check-ups, safety surveillance) and implementation of ergonomics standards or threshold limit values would be more important than increasing industrial production.

WRET efforts at all levels are in a key position to provide prerequisites for better occupational health and safety (OHS). Educational elements in OHS should already be included in the learning modules of primary and vocational

schools in order to improve the public's general awareness of the relationship between work and health. All the parties to working life, employers, workers, authorities, OHS experts, researchers, and others, should be involved in a lifelong learning process, and this process should include OHS. WRET should also consider that the needs of the target groups and the content of their training depend on their context of occupations and the branch of industry in question.

8. CONCLUSION

Despite the availability of scientific evidence on various OHS risks and hazards, there is still an urgent need for further activities in WRET. This is because working life is changing continuously, and because new exposures and new risks are emerging. This should be organised in a concerted manner with a view to effectively using the limited resources by networking institutions. More scientifically-based research and training information on the effects of efforts to promote OHS and to maintain work ability are also needed. Therefore, WRET institutions throughout the world should consider contributing to the ILO SafeWork Programme.

As this paper discusses why health and safety measures are lacking in DCs, the views expressed in different sections of this paper are the views of these authors and do not necessarily reflect the views of the authors' affiliated office or research centre or any other organisation. The authors acknowledge that *Work Study* has accepted for publication parts of this paper.

REFERENCES

- Abeyssekera, J.D.A. (2000a). Masters programmes in ergonomics at Luleå University of Technology, Sweden. *International Journal of Industrial Ergonomics*, 26, 569–570.
- Abeyssekera, J.D.A. (2000b). The tenth anniversary ergonomic conference at the Luleå University of Technology. *International Journal of Industrial Ergonomics*, 26, 571–572.
- Ahasan, M.R. (2001a). Legacy of implementing industrial health and safety in the developing countries. *Journal of Physiological Anthropology & Applied Human Sciences*, 20(6), 311–319.
- Ahasan, M.R. (2001b). Global corporate policy for financing health services in the third world: The structural adjustment crisis. *International Quarterly of Health Education*, 20(1), 3–15.
- Ahasan, M.R. (2002). *Occupational health, safety and ergonomic issues in a developing country*. Unpublished doctoral dissertation, University of Oulu, Finland.
- Ahasan, M.R., Quddus, R., & Mohiuddin, G. (1998). Launching ergonomics in Bangladesh —Effective collaboration between engineers and others. *Asian-Pacific Newsletter on Occupational Health and Safety*, 5(3), 64–66.

- Annan, K.A. (1997). Occupational health and safety: A high priority on the global, international and national agenda. *Asian-Pacific Newsletter on Occupational Health and Safety*, 4, 59–59.
- Bold, J. (1996). Role of state labour inspectors in the prevention of occupational accidents. *Asian-Pacific Newsletter on Occupational Health and Safety*, 3(2), 36–37.
- Christiani, D.C., Durvasula, R., & Myers, J. (1990). Occupational health in developing countries: Review of the research needs. *American Journal of Industrial Medicine*, 17, 393–401.
- Course report—OHS research in developing countries. (1993). Unpublished manuscript, Nordic Institute for Advanced Training in Occupational Health and Safety (NIVA).
- Cullen, M.R., & Harari, R. (1995). Occupational health research in developing countries—The experience of Ecuador. *International Journal of Occupational and Environmental Health*, 1, 39–46.
- El-Batawi, M.A. (1981). Special problems of occupational health in the developing countries. In R.S.F. Schilling (Ed.), *Occupational health practice* (pp. 27–46). London, UK: Butterworth.
- Elgstrand, K. (1985). Occupational safety and health in developing countries. *American Journal of Industrial Medicine*, 8, 91–93.
- Fernau, C.N. (1981). *The use of photographs in workers' education*. Geneva, Switzerland: International Labour Office.
- Holkeri, H. (2001). Globalisation and its effect on occupational health and safety. *Asian-Pacific Newsletter on Occupational Health and Safety*, 8(3), 51–51.
- International Labour Organization (ILO). (1996). *Recording and notification of occupational accidents and diseases, code of practice*. Geneva, Switzerland: Author.
- Khamis, M.M. (1992). Occupational health services and the role of factory inspectorate. *African Newsletter on Occupational Health and Safety*, 2(Suppl. 2), 58–61.
- Kogi, K. (1998). Collaborative field research and training in occupational health and ergonomics. *International Journal of Occupational and Environmental Health*, 4, 189–195.
- Kogi, K., & Kawakami, T. (1997). Current research on ergonomics. *Environmental Management and Health*, 8, 188–190.
- Lukindo, J.K. (1991). Focus on the factory inspectorates: Challenges and prospects in the 1990s. *African Newsletter on Occupational Health and Safety*, 2(Suppl. 2), 11–14.
- Mohan, D. (1987). Injuries and the poor worker. *Ergonomics*, 30, 373–377.
- Partanen, T.J., Hogstedt, C., Ahasan, M.R., Aragon, A., Arroyave, M.E., Jeyaratnam, J., et al. (1999). Collaboration between developing and developed countries and between developing countries in occupational health research and surveillance. *Scandinavian Journal of Work, Environment and Health*, 25(3), 296–300.
- Phoon, W.O. (1983). Occupational health in developing country: A simple case of neglect. *World Health Forum*, 4, 340–343.
- Rahman, M., Laz, T.H., & Fukui, T. (1999). Health related research in Bangladesh: MEDLINE based analysis. *Journal of Epidemiology*, 9(4), 235–239.
- Rantanen, J.E. (1989). Occupational health and safety research: Current status and priorities. *East African Newsletter on Occupational Health and Safety*, 3(Suppl.), 51–52.
- Rantanen, J.E. (1994). Research in the prevention of work-related diseases. *Työterveys*, 3, 21–24.
- Rantanen, J.E. (1997). Occupational health and safety training as a part of life long education. *African Newsletter on Occupational Health and Safety*, 7, 52–55.

- Saxena, S.K (1997). System for the control of major accident hazards in India. *Asian-Pacific Newsletter on Occupational Health and Safety*, 4(1), 4–6.
- Shahnavaz, H., & Abeysekera, J.D.A. (1991). Ergonomics education and training for industrially developing countries. In Y. Quéinnec & F. Daniellou (Eds.), *Proceedings of the 11th Congress of the International Ergonomics Association, Designing for Everyone* (pp. 1736–1737). London, UK: Taylor & Francis.
- Takala, J. (1999). Indicators of death, disability and disease at work: The global programme on safety, health and the environment. *African Newsletter for Occupational Health and Safety*, 9(3), 1–5.