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Gender and the environment: A survey in the manufacturing of machine-parts sector in Indonesia and China

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Small Enterprise Programme

Job Creation and Enterprise
Development Department

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Foreword

In 2007, the International Labour Conference of the ILO discussed the promotion of sustainable enterprises. The Conference sought to take stock of the debate on the role of the private sector and enterprise development in overall economic and social development; to assess the relevance and implications of recent trends with respect to the implementation of the Decent Work Agenda; to provide an ILO contribution to the debate; and to provide guidance to the Office on its work in this area.

The conclusions to the discussion on the promotion of sustainable enterprises underscore the principle that sustainable enterprises need sustainable societies and that business tends to thrive where societies thrive and vice versa. The conclusions outline six enterprise level characteristics of a sustainable enterprise, which include good industrial relations, human resource development, decent working conditions, productivity and shared benefits, corporate social responsibility and corporate governance.

The Sustaining Competitive and Responsible Enterprises (SCORE) programme is a global technical assistance programme developed by the ILO to support SMEs' development and create decent work. It integrates the 6 characteristics of sustainable enterprises listed above. The programme aims to solve problems faced by SMEs through a short-term training for managers and employees, along with on-site expert consultations and guidance to improve quality, raise productivity, establish good workplace practices and improve management systems. Ultimately, SCORE aims to help enterprises improve their quality and productivity while also enhancing their worker/manager relationships through communication and dialogue. This is expected to have an impact on the overall progress and profitability of the enterprise.

Two key modules of the SCORE training are Productivity Through Cleaner Production and Safety and Health at Work– A platform for Productivity. Both of these modules strive to help SMEs achieve the important productivity gains that can come from cleaner production and improved health and safety on the factory floor.

This paper provides important insights into the gender dimensions of work in the factories that the SCORE project trains. Many of these findings can be used to help conduct risk assessment of the health and safety conditions in these factories and ensure that the very real differences between men and women, both physical and psychological, are taken into account when designing procedures and systems to protect workers against these risks. It is hoped that this paper will help both project staff, enterprise managers and practitioners in general to understand better what connections between gender, occupational safety and health, and environmental protection are and how they can be best used in sustainable enterprises.

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Executive Summary

Background

“Sustaining Competitive and Responsible Enterprises” (SCORE) is the title of a project of the International Labour Organization (ILO) dealing with sustainable enterprises to pursue decent work in seven developing countries. The project deals mainly with the provision of business services and the delivery of training in five areas, including occupational safety and health, human resource management, and environmental management.

The approach which has been chosen in this research activity is that of occupational safety and health (OSH) and environmental protection. Preventing work-related accidents and encouraging safe work practices have the dual positive effect of protecting workers' health as well as the environment. Occupational injuries and deaths have a negative impact on productivity as well as on social and economic development. The International Labour Organization has adopted several legal instruments for the promotion of a safe and healthy work environment.

The international literature on female workers, occupational safety and health, and environmental protection is scarce. Starting from available data on both fatal and non-fatal injuries by gender in the manufacturing sector, it appears that in both developing and developed countries men experience more injuries than women. The occupational safety and health risks to male employees are better known because traditionally the focus has been on dangerous jobs in sectors where men were a large majority. However, the increasing proportion of women in the global workforce over the past few decades has raised attention to gender-related questions on the different effects of work-related risks on men and women.

Over the past four decades, researchers have conducted extensive work on the conceptualization and measurement of personal environmental concern. Evidence shows that women have greater commitment to environmentalism relative to men. Research suggests that general gender-based environmental behaviours exist cross-culturally and at every age.

Willingness to contribute to the environment which is stronger in women is especially useful in situations where it is very expensive to set up an enforcement system for environmental protection. As a consequence, voluntary compliance lowers the cost of operations.

Objective

The main objective of the research activity described herein is to shed light on the conditions of female employees as compared to their male colleagues in terms of environmental tasks assigned, injuries suffered and accidents linked to machines which may be hard to use particularly for female workers. The countries which have been chosen for this investigation are China and Indonesia, and the sector which the research focuses on is manufacturing of machine parts.

Three research questions have been addressed using data obtained through a survey of 100 employees from 10 firms per country which participated in the SCORE project. The surveys were carried out in September 2011. The research questions are listed below.

Findings

- *Are women exposed to greater occupational safety and health risks than men?*

Occupational safety and health risks for both men and women have been measured through injuries suffered over the past 3 years. Following the ILO Convention and Recommendation concerning Benefits in the Case of Employment Injury, No. 121, adopted in 1964, employment injuries can be defined as all injuries resulting from accidents arising out of or in the course of employment (industrial accidents and commuting accidents) and all occupational diseases.

It can be concluded that in the Indonesian surveyed firms women employees are more exposed to occupational safety and health risks than men. The situation is worse for women who are under 30, who are workers, and employed either in the "automotive components (electrical and similar)" sub-sector or in the "press metal for automotive components and similar" one.

Findings on China differ considerably from those on Indonesia. Women working in the manufacturing of machine-parts sector in China are not more exposed to occupational safety and health risks than men. It can be added that the overall low number of injuries leads to the conclusion that for all employees, occupational safety and health risks are not high. It is however to be noted that interviewed employees were selected by companies and they could be those who have not experienced many injuries. Moreover, one cannot exclude that the different cultures may determine a higher degree of openness of Indonesian interviewees as compared to Chinese ones in revealing what could cause problems with their employers.

- *Is machinery/equipment adjusted to women?*

This question has been addressed by considering the number of accidents due to a machine/equipment which is hard to use for a worker. Following the ILO Convention and Recommendation concerning Benefits in the Case of Employment Injury, No. 121, both adopted in 1964, Work accidents can be defined as accidents occurring at or in the course of work which may result in death, personal injury or disease. Accidents may have a negative impact on the environment and this is why they are being considered in this research. If they are caused by machines and/or equipment which are hard to use, in particular for a female worker, a direct link between gender and the environment can be established.

It is not possible to conclude that machines or equipment are not adjusted to women workers in Indonesia. Accidents due to a machine/equipment which are hard to use for a worker do happen, but they concern more male employees than female ones. This could be due to the small size of men which could make machinery difficult for them to use.

One issue which clearly emerges from the survey in Indonesia is that out of the 100 employees who have been interviewed, only a woman working on human resource development has received training on use of equipment, safety procedures, and risk aspects of her occupation, and none have benefited from any training on handling of chemicals and dangerous air and water emissions. The provision of adequate training could improve the situation both in terms of injuries which could be due to poor safety equipment and procedures, and in terms of preventing accidents caused by machines/equipment which are hard to use for workers, both men and women alike.

Findings on China are similar to those on Indonesia, in that it cannot be concluded that machines/equipment are not adjusted to female workers. Accidents due to a machine/equipment which is hard to use for a worker do happen, but they concern more male employees than female ones.

Unlike in the case of the surveyed employees in Indonesia, the large majority of interviewees in China have received training both on use of equipment, safety procedures, and risks aspects of their occupations, and on handling of chemicals and dangerous air and water emissions. However, available data does not allow any firm conclusion to be drawn about the impact of training. If we compare data on injuries and witnessed accidents in China to those on Indonesia, it is likely, but not supported by concrete evidence, that training strongly contributed to lower numbers. Stricter rules and regulations could be another factor accounting for the better performance of Chinese companies compared to Indonesian ones in this regard.

- *Are women assigned more housekeeping tasks and environmental protection measures than men in firms?*

In order to measure housekeeping tasks and environmental protection measures, several options were proposed to interviewees. These include being in charge of cleaning, maintenance of machines, waste collection and disposal, security control, noise level control, receiving complaints from outside and inside the company on environmental or health issues, transport, storing, labelling, and specific production task. Interviewees were also given the option of adding any other specific environmental task.

Neither male nor female Indonesian interviewees have received any training on the environmental impacts of their jobs. The lack of general awareness of the fact that every job has some environmental impact has resulted in answers which offer scarce information to properly address this research question. The information available is very scarce and does not allow any firm conclusion to be drawn.

Chinese interviewees seem to have a better understanding of the type of environmental tasks that their jobs entail. There is a striking difference in the range and variety of environmental tasks performed by men as opposed to those performed by women. Female interviewees are certainly fewer than their male counterparts, but they selected only 4 types of environmental tasks as opposed to the 9 (more than double) which have been chosen by men. If we then consider the specific content of the tasks selected, women tend to be relegated to low-level jobs. For instance, although in the chosen sample women number one third of the sample size, they have opted for cleaning tasks 30 times, whereas men have chosen that option 37 times. Unlike women, a large share of men seem to be in management positions with environmental tasks having a direct impact on

the environmental behaviour of other colleagues. Clearly, since they have more influential jobs, men have a much more important role to play than women in environmental protection.

What the findings of the present research indicate is that even if women are better than men in the implementation of environmental protection measures, they are denied a chance to show it, because they are absolutely under-represented in management positions, and it is by being in top-management jobs that one can make a difference in environmental protection. This result has direct implications in terms of missed opportunities in productivity gains. If women were in management positions, the international literature suggests that enforcing environmental management systems would cost less thanks to the higher degree of women's voluntary compliance.

Recommendations

For China, a major issue is the promotion of career progression for women. The advancement of women in management positions would certainly improve the performance of Chinese companies in the area of environmental protection, and would entail productivity gains and lower costs.

A striking result of the survey in Indonesia is that there is a remarkable difference between injuries and accidents reported by firms and those suffered and witnessed by employees. Regardless of the explanation, what really matters is that top management should be at least aware of the real situation as well as of the remedies which can be adopted.

Training on occupational safety and health (OSH) standards is a key priority to improve the working conditions of employees in Indonesian enterprises. Training should target specific groups who suffer more injuries and accidents than others, in particular women.

For both countries, it is strongly recommended to undertake another survey based on the same questionnaire on an annual basis, especially after training courses have been organised in Indonesia.

1. Introduction

“Sustaining Competitive and Responsible Enterprises” (SCORE) is the title of a project of the International Labour Organization (ILO) dealing with sustainable enterprises to pursue decent work in seven developing countries. The project was launched in 2009 and is expected to close at the end of 2012.

The project deals mainly with the provision of business services and the delivery of training in five areas, including occupational safety and health, human resource management, and environmental management. In addition, one of the outputs of the SCORE project consists of the implementation of research activities and the publication of working papers. A research theme which has been selected is gender and the environment.

The approach which has been chosen is that of occupational safety and health (OSH) and environmental protection. Preventing work-related accidents and encouraging safe work practices have the dual positive effect of protecting workers' health as well as the environment. Interventions in this area are among the most cost-effective measures for environmental protection that the ILO can promote. Preventing accidents through the sound use of machines and clean work practices safeguard the environment from dangerous spills, emissions and damage.

The main objective of the research activity described in the present paper is to shed light on the conditions of female employees as compared to their male colleagues in terms of environmental tasks assigned, injuries suffered and accidents linked to machines which may be hard to use particularly for female workers. The countries which have been chosen for this investigation are China and Indonesia, and the sector which the research focuses on is manufacturing of machine parts.

Three research questions have been addressed using data obtained through a survey of 100 employees from 10 firms per country which participated in the project. The research questions are as follows:

- Are women exposed to greater occupational safety and health risks than men?
- Is machinery/equipment adjusted to women?
- Are women assigned more housekeeping tasks and environmental protection measures than men in firms

The findings of the present research will contribute to enriching the scarce literature which exists on this specific topic, as well as to better shaping project activities in order to introduce measures which can address the issues which emerge from this investigation. In particular, survey results will be used to better focus training courses especially on occupational safety and health to the actual needs of SCORE enterprises operating in the manufacturing of machine-parts sector in China and Indonesia.

The background chapter of this paper provides information on security and productivity, and on the ILO principles governing occupational safety and health; it also offers an overview on international literature concerning OSH,

gender and the environment. Chapter 3 describes the methodology which has been adopted and how it has been implemented. Chapter 4 and its sub-sections address each one of the three research questions, presenting and discussing results. The final chapter draws conclusions and offers recommendations moving forward.

2. Background¹

2.1. Security and productivity

Occupational safety and health are key aspects of decent work, and the ILO promotes safe and healthy jobs. More in general, occupational injuries and deaths have a negative impact on productivity as well as on social and economic development.

The majority of accidents are not reported and not known to the public because they have minor effects. However, taken all together, those smaller accidents can have devastating social, economic and environmental impacts. To quantify costs to enterprises and society at large, one can consider a major catastrophe like the Bhopal accident which occurred in India in 1984. Over 20,000 people have died as a consequence of the injuries they received. Moreover, costs for the owners amounted to approximately US\$500 million in compensation.²

Some direct and indirect costs of accidents and ill health include:³

Direct costs:

- Disruption to business activity and lost production due to workers' absence.
- Workers' lost wages and costs for retraining for a different job.
- First aid, medical and rehabilitation costs.
- Insurance costs and possibly higher premiums in the future.
- Compensation costs.
- Costs for fines and legal proceedings.
- Costs for repairing or replacing damaged equipment.

Indirect costs:

- Management time for investigation and follow-up.
- Costs for retraining a substitute worker and/or for recruiting a new one.
- Poor long-term employability for injured worker.
- Loss of life quality.

¹ This section draws largely on research conducted by Ms. Fang He during her internship with the SCORE project in summer 2010, and by Mr. Matthew Pavitt during his internship in winter 2011.

² ILO. 2006. Occupational safety and health: Synergies between security and productivity. Governing Body Committee on Employment and Social Policy (Geneva).

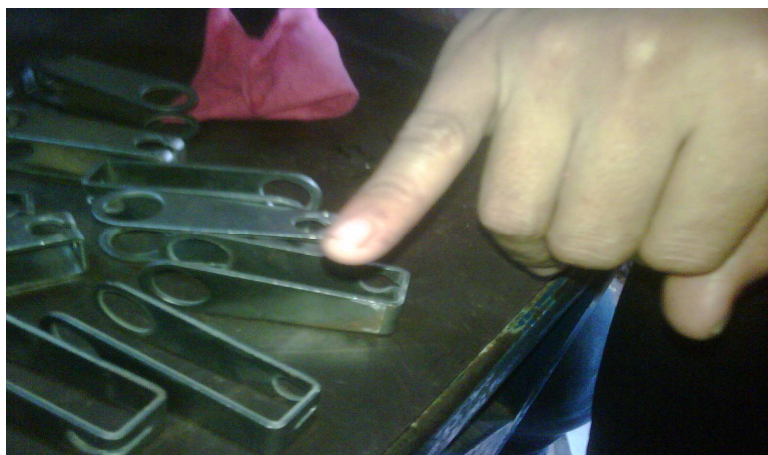
³ Ibid.

- Lower motivation to work in the enterprise where an accident occurred.
- Poor enterprise reputation and client and public relations.
- Damage to the environment especially from chemical accidents.

The International Labour Organization has adopted several legal instruments for the promotion of a safe and healthy work environment. The latest one is the Promotional Framework for Occupational Safety and Health Convention no. 187 of 2006, and its accompanying Recommendation 197. These instruments encourage countries to adopt national OSH programmes, establish a preventive safety and health culture, and apply a system approach to the management of OSH. On national OSH policy and action at the national and enterprise level, conventions 155 and 161, and recommendations 164 and 171 are also relevant.

Some important principles contained in the above-mentioned instruments in connection with the present research include:

- Occupational safety and health education and training should be provided, in particular to management, supervisors, workers and their representatives.
- The exchange of occupational safety and health statistics and data should be facilitated among relevant authorities, employers, workers and their representatives.
- There should be research on occupational safety and health.
- Information and advice should be provided to employers and workers and their respective organizations with a view to eliminating or minimizing work-related hazards and risks.
- The constraints of micro-enterprises and small and medium-sized enterprises and contractors should be addressed in the implementation of occupational safety and health policies and regulations.
- Information on occupational injury statistics should be available.
- Employers should ensure that, so far as is reasonably practicable, the workplaces, machinery, equipment and processes under their control are safe and without risk to health.
- Employers should provide, where necessary, adequate protective clothing and protective equipment to prevent, so far as is reasonably practicable, risk of accidents or of adverse effects on health.



Abrasions to a worker's finger due to no protective gloves being worn when handling sharp edged metal.

(Copyright: Mila Gustia)

2.2. Occupational safety and health risks for men and women

The international literature on female workers, occupational safety and health, and environmental protection is scarce. It is almost non-existent if we consider the specific sector covered in the present paper, which is manufacturing of machine parts.

Starting from available data on both fatal and non-fatal injuries by gender in the manufacturing sector, as the following table indicates, for all countries considered, both developing and developed ones, men experience more injuries than women. For example, in Mauritius reported injuries were 6.3 in 2004 and 5.4 in 2008 for men per only one injury for women in the same years; in Poland, 4.9 and 4.1 injuries were reported for men per one injury for women in the same years.

Table 2.1: Ratio of male to female reported manufacturing injuries, with lost workdays

	2000	2004	2008
Australia*	5.75	45.29	42.88
Azerbaijan	-	6.30	58.00
Croatia*	3.80	4.56	4.30
Estonia*	-	-	2.13
Finland*	5.43	5.76	-
France*	4.17	-	-
Honduras	5.14	-	-
Hungary	3.40	2.90	2.93
Lithuania	2.70	3.29	2.02
Mauritius	-	6.29	5.42
Mexico	-	-	2.39
Myanmar	5.76	2.26	2.44
Nicaragua*	2.48	-	-
Poland	4.79	4.90	4.14
Sri Lanka	4.51	-	-
<i>*Compensated injuries</i>			

Source: ILO Laborsta.

Unfortunately, specific data for China and Indonesia is scarce. Between 1995 and 1997, reported injuries, both fatal and non-fatal, in the manufacturing

sector in China rose from 4,142 to 4,384. During the same period in Indonesia both fatal and non-fatal compensated injuries in the same sector decreased from 8,678 to 4,486.⁴ It also appears that in China, during the period 1994-2000 half of recorded traumatic injuries of the hand were work-related, with machinery workers being among the job categories at increased risk of inducing hand injuries. Punch, electric saw and planer, and knives were the tools usually causing hand injuries. The most of these accidents occurred in enterprises owned by townships and in small private businesses. The principal causes of hand injuries seemed to be inadequate OSH training, fatigue and distraction, poor functioning of machines, lack of cooperation among workers, and absence of preventive measures.⁵ Moreover, a survey conducted in 2008 in Eastern Chinese cities reveals that the safety climate level perceived by employees in the manufacturing sector was low, and more so in small enterprises than in large ones. Lack of safety training and management support were the two main causes accounting for this result.⁶ Regrettably, available data is not disaggregated by gender.

The emerging picture depicted in the table above, according to which men are more subject to injuries than women, is confirmed by international literature which also offers much more information on male employees as opposed to female ones.

In 2001, the European Trade Union Technical Bureau for Health and Safety conducted a survey in the then 15 European Union member states on gender and health and safety. The findings revealed that most OSH policies are based on a gender-neutral model and that issues related to women's health were neglected.⁷

The occupational safety and health risks to male employees are better known because traditionally the focus has been on dangerous jobs in sectors where men were a large majority. However, the increasing proportion of women in the global workforce over the past few decades has raised attention to gender-related questions on the different effects of work-related risks on men and women.⁸

In general, men are employed in jobs that expose them to accidents more than women. This is why they are more likely to experience fatal accidents and

⁴ ILO Laborsta.

⁵ He, Y.; Liang, Y. 2008. Work-related hand injury in China and initiatives to study the factors affecting return-to-work after injury. *Asian-Pacific Newsletter on Occupational Health and Safety*, April, 15(1).

⁶ Ma, Q.; Yaun, J. 2009. Exploratory study on safety climate in Chinese manufacturing enterprises. *Safety Science*, 47.

⁷ Vogel, L. 2004. A GENDER for action. *The Safety and Health Practitioner*, 22(8).

⁸ ILO. 2009. *ILO's decent work: Providing safe and healthy workplaces for both women and men* (Geneva).

other work-related deaths. It also seems that men tend to adopt less preventive and protective ways of performing work assignments than women.⁹

A study focusing on the United States reveals that overall, female workers suffered fewer fatal and nonfatal injuries than men during the period 1992-2003. Women were much less likely to die on the job than men. The same report states that women and men have jobs with different characteristics, which explains the differing degrees and ways in which either gender-based group is hurt or becomes sick at work. For instance, women reportedly accounted for a very small portion of injuries caused by falls because they were not employed in the jobs and sectors where most falls occurred. In 2003, the major sources of workplace injuries for women were musculoskeletal disorders due to bodily reaction, repetitive motion and overexertion.¹⁰

In manufacturing factories in export-processing zones where women represent the majority of the workforce, female employees work long hours at non-ergonomic work-stations. They may often work with machinery without basic protection. Industrial machinery is generally designed for men and is often difficult for women and small men to use. Women prevail also in microelectronics, a sector where they are exposed to chemicals which can have carcinogenic effects.¹¹

According to the European Agency for Safety and Health at work, there are three factors that should be taken into account. First of all, women and men are concentrated in specific types of jobs, and therefore face hazards particular to those jobs. Second, women and men are physically different, which should be reflected in protection measures. Last but not least, women and men have different responsibilities at home. Working women may have dual responsibilities, both at work and at home.¹²

In 2006, the All China Federation of Trade Unions organized a national survey on the occupational safety and health situation of women workers. The working conditions and OSH situation of Chinese female employees turned out to be worrisome, particularly in small and medium-sized enterprises. Problems identified include poor and unsafe working conditions, lack of safety measures, injuries, ill health and poisoning, long and extra working hours, and heavy workloads.¹³

⁹ ILO. 2009. ILO's decent work: Providing safe and healthy workplaces for both women and men (Geneva).

¹⁰ Hoskins, A. B. 2005. Occupational injuries, illnesses, and fatalities among women. *Monthly Labour Review*, 31-37.

¹¹ ILO. 2009.

¹² European Agency for Safety and Health at Work. 2011. Women and health at work. Accessed 20 October 2011, available at: http://osha.europa.eu/en/priority_groups/gender/

¹³ Zhu, C. 2008. Labour protection for women workers in China. *Asian-Pacific Newsletter on Occupational Health and Safety*, December, 15(3).

The use of machinery and equipment is likely to be a major source of musculoskeletal injuries for female employees in firms operating in the manufacturing sector. A preliminary analysis reveals that no enterprise participating in the SCORE project has adopted any specific measure for female employees in this regard.¹⁴ Enterprises participating in the SCORE project should adopt approaches for the promotion of decent work, fully integrating the three factors identified by the European Agency for Safety and Health at work, and taking into account the special needs of female employees.

2.3. Gender and environmental protection

Over the past four decades, researchers have conducted extensive work on the conceptualization and measurement of personal environmental concern. Individual behaviour seems to be shaped by gender expectations and cultural norms.¹⁵

It is suggested that model of Career Choice and Work Behaviour, childhood play, household chores, and early paid work experience are differentiated by gender. These differences produce differentiated skills, perceptions of one's job role and impressions of what activities can best satisfy various human needs.¹⁶ As a consequence, women tend to take on roles as caregivers and nurturers. Furthermore, they have shown to value altruism which is then associated to environmental behaviours.¹⁷

Evidence shows that women have greater commitment to environmentalism relative to men. They have higher relative levels of environmentally-friendly behaviours in regular daily routines. For example, women recycle, buy organic produce, save energy, reuse objects more than men. Research suggests that these general gender-based environmental behaviours exist cross-culturally.¹⁸ Furthermore, women are more concerned about the environment than men at every age.¹⁹

¹⁴ This is the result of research work conducted by Ms. Fang He during her internship with the SCORE project in summer 2010.

¹⁵ Hunter, L.M.; Hatch, A.; Johnson, A. 2004. Cross-national gender variation in environmental behaviors. *Social Science Quarterly*, The Southwestern Social Science Association, 85(3).

¹⁶ Astin, H. S. 1984. The meaning of Work in Women's lives: A Socio-psychological model of career choice and work behavior. *The Counselling Psychologist*, 12 (4).

¹⁷ Perun, P. J. and Bielby, D. 1981. Towards a model of female occupational behaviour: A human development approach. *Psychology of Women Quarterly*, 234-252.

¹⁸ Hunter et al. 2004.

¹⁹ Torgler, B.; García Valiñas, M.A.; Macintyre, A. 2008. Differences in preferences towards the environment: The impact of a gender, age and parental effect. *The Fondazione Eni Enrico Mattei Note di Lavoro Series*.

Findings from OECD countries confirm that women are more likely to recycle and place a higher value on energy-efficient transport. The OECD also found that from the age of 15, girls tend to have higher levels of concern for the environment and a greater sense of responsibility for sustainable development than boys.²⁰

Following these lines of reasoning, it is natural to expect that while at work, women would be more involved in environmentally-friendly behaviours. This is confirmed by the fact that women traditionally work at home more than men and enjoy a greater likelihood to engage privately in environmentally-friendly behaviours, including at the workplace rather than in the public domain.²¹

It seems that voluntary compliance in terms of environmentally-friendly behaviours is primarily driven by social norms or preferences for environmental protection. Willingness to contribute to the environment which is stronger in women is especially useful in situations where it is very expensive to set up an enforcement system for environmental protection. As a consequence, voluntary compliance lowers the cost of operations.²²

Women are also effective actors or agents of change. UN Women Watch has produced a comprehensive report on Women, Gender Equality and Climate Change, which points out that women often have a strong body of knowledge and expertise that can be used in environmental protection measures. Furthermore, women's responsibilities in households and communities, as stewards of natural and household resources, position them well to contribute to livelihood strategies adapted to changing environmental realities.²³ It therefore seems that women have skills and knowledge to contribute to environmental protection measures more than men.

²⁰ OECD. 2008. Gender and sustainable development: Maximizing the economic, social and environmental role of women (Paris).

²¹ Torgler et al. 2008.

²² Ibid.

²³ http://www.un.org/womenwatch/feature/climate_change/factsheet.html

3. Methodology

The research questions addressed are the following:

- Are women exposed to greater occupational safety and health risks than men?
- Is machinery/equipment adjusted to women?
- Are women assigned more housekeeping tasks and environmental protection measures than men in firms?

The questions were proposed, discussed and selected by ILO staff mainly from the Enterprise Department and with expertise in the areas of enterprise development, gender and environmental sustainability. The purpose of discussions was to identify research questions which would shed some light on existing linkages between gender and the environment, and in particular on the role of women in environmental protection. The perception was that there is a knowledge gap in this area and that studying SCORE enterprises could be a good opportunity to learn more and to improve negative situations had the case arisen.

A survey is the main instrument which has been chosen to answer the research questions. It has been conducted in 10 companies in Indonesia and 10 in China participating in the SCORE project from the manufacturing of machine-parts sector. The specific geographical areas where the survey was carried out are Jakarta in Indonesia and Chengdu, in the Sichuan province in China.

If we consider the International Standard Industrial Classification of All Economic Activities, there is no specific sector called “manufacturing of machine parts”. However, the economic activities included in that sector and listed in the International Standard Industrial Classification are Manufacture of chemicals and chemical products; Manufacture of fabricated metal products, except machinery and equipment; Manufacture of machinery and equipment not elsewhere classified; Manufacture of electrical machinery and apparatus not elsewhere classified; Manufacture of other non-metallic mineral products; and Manufacture of motor vehicles, trailers and semi-trailers. It is to be added that the SCORE project covers industrial clusters rather than economic sectors. This is why sometimes, as in the case of China, even a firm operating in the area of concrete has been surveyed.

Surveyed companies are used to represent enterprises from the manufacturing of machine-parts sector participating in the SCORE project in China and Indonesia. The total number of firms in this sector is 30 for China and 16 for Indonesia.

In general and whenever possible, 10 employees per firm have been interviewed. This is a reasonable number in Indonesia, where 9 of the 10 surveyed enterprises have 150 employees or less, with 3 of them having 50 or less. In China, surveyed firms are much larger, with 7 of them employing more than 250 people. The sample size in this case is therefore somewhat less representative.

In Indonesia, of the 100 interviewees, 51 are men and 49 women, whereas in China, interviewees consist of 66 men and 34 women. Annex b shows the total number of employees of surveyed enterprises in both countries with a gender breakdown of data.

The questionnaire (appendix A) was developed by ILO and SCORE technical staff and has been conceived for use by enterprises in different sectors and countries covered by the SCORE project. It is relatively short and consists of fourteen questions. Nine questions are to be answered by the employees. The other five concern the company and are to be answered by management.

Questions have been formulated as closed ones, in order to make the process of collecting answers as speedy as possible, with the intention of avoiding the disruption of enterprise activity. A limit of this choice is that open questions would have offered a wider range of information and a broader body of knowledge about recorded experiences.

Interviews were to be held on a one-to-one personal level. Since some gender-related issues were considered to be rather sensitive, especially for women, a female national consultant was recruited for conducting the interviews in both countries.

During the implementation phase some differences emerged between the two countries. The Indonesian interviewer felt that people were more willing to disclose important information when they were in informal group situations. It was estimated that particularly women were more open to providing sensitive information when they were not alone with the interviewer. Groups of employees were therefore sometimes approached during their break time, in social, informal moments.

In China the consultant was not free to choose her interviewees. Companies provided her with lists of employees who had been selected for being interviewed. In this case, questionnaires were indeed filled through one-to-one personal interviews.

The surveys were carried out during the month of September 2011. A pilot phase focusing on 2 companies and 20 interviews was also organized in order to test the questionnaire in Indonesia. No relevant issue was recorded and no change was therefore made to the questionnaire.

The answers were recorded both manually in printed sheets and electronically in an Excel answer-sheet to facilitate data analysis. The analysis of the answers was carried out at ILO headquarters in Geneva during the month of October 2011 and its results are contained in the present report.²⁴

²⁴ Some hypotheses were tested using the chi-square test, in particular to answer the first research question listed above. The chi-square test has been chosen because it is a non-parametric test based on no assumptions regarding data distribution, it allows observations about two independent variables to be grouped into two or more categories, and observations must be counts as in our case.

Addressing the third research question was a challenge from the phase of designing the questionnaire. A key priority was to keep the total number of questions very low in order not to disrupt enterprise activity with lengthy interviews. It was therefore necessary to address the issue of whether women workers are assigned more housekeeping tasks and environmental protection measures than men possibly using only one question. Measuring “housekeeping tasks” and “environmental protection measures” in work assignments was not easy. However, the results obtained for China are satisfactory. The third research question can be clearly answered which means that the way the corresponding question was formulated in the questionnaire is acceptable.

Nonetheless, the difficulties encountered in the formulation of an appropriate question reappeared in the phase of data analysis for the case of Indonesia, where it was found that answers do not reveal any significant finding. In Indonesia, this research question would have probably been better addressed through observation of behaviours in the firms than through a questionnaire.

4. Results and discussion

The following sub-sections will address each one of the three research questions by country. Results of data analysis and findings will be presented, and emerging issues discussed.

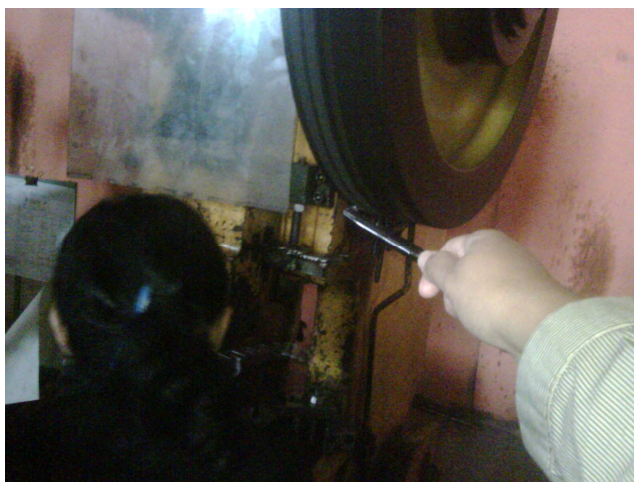
4.1. Are women exposed to greater OSH risks than men?

Occupational safety and health risks for both men and women have been measured through injuries suffered over the past 3 years.

Following the ILO Convention and Recommendation concerning Benefits in the Case of Employment Injury, No. 121, adopted in 1964, employment injuries can be defined as all injuries resulting from accidents arising out of or in the course of employment (industrial accidents and commuting accidents) and all occupational diseases.

It is useful to refer also to the Resolution concerning statistics of occupational injuries (resulting from occupational accidents, adopted by the Sixteenth International Conference of Labour Statisticians in 1998.)²⁵

An occupational accident is defined as “an unexpected and unplanned occurrence, including acts of violence, arising out of or in connection with work which results in one or more workers incurring a personal injury, disease or death”. Commuting accidents to the workplace are included in this definition. Furthermore, an occupational injury is considered to be “any personal injury, disease or death resulting from an occupational accident”.



Female worker at her station with no protective headgear and dangerously close to a rotating wheel.
(Copyright: Mila Gustia)

²⁵ http://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/normativeinstrument/wcms_087528.pdf

4.1.1. Indonesia

Over the past 3 years, surveyed companies in Indonesia have recorded a total of 120 injuries among their employees. The figure is quite different from experiences reported by employees. Interviewees reveal that they have experienced 629 injuries in total over the same period of time, with women suffering 415 and men 214.

On average, women have reportedly experienced 8.47 injuries over the past 3 years, whereas their male counterpart revealed having suffered only 4.2. This striking result somehow contradicts findings from the international literature and secondary data presented in section 2.2. An explanation can be the fact that manufacturing of machine parts, a sector where injuries may not be unusual events, is not a sector where women have been and are traditionally employed.

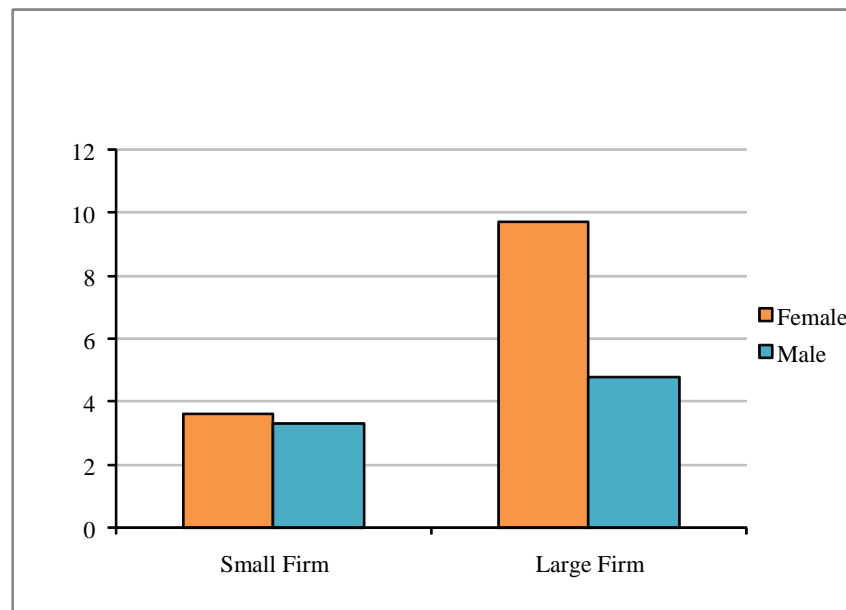
For both men and women, the mode is 0. This means that the majority of both female and male employees have not experienced any injury over the past three years. It therefore seems evident that there are specific groups of employees who are exposed to a relatively high number of injuries compared to their colleagues. Who are they?

4.1.2. Size of the enterprise

One may wonder whether the size of the enterprise makes any difference. There may be a difference in the number of injuries for women workers employed in companies with 50 workers or less (3 out of 10) compared to female employees in enterprises with more than 50 workers. Data show that on average, women working in smaller firms have experienced 3.6 injuries, and female employees of larger companies have suffered on average 9.7.²⁶ The following chart depicts this finding. As it clearly appears, also men experience more injuries when they are employed in larger firms. Male employees working in enterprises with 50 employees or less have experienced on average 3.3 injuries as opposed to men in larger companies who have suffered 4.8.

²⁶ In order to further corroborate this finding, this hypothesis has been tested. It turns out that we can conclude with a very high degree of certainty (8.95202E-13 with P set at 0.05) that indeed, female workers in larger companies are more likely than all other employees to suffer from injuries.

Figure 4.1: Injuries suffered by women and men over the past 3 years in small enterprises (50 employees or less) and large enterprises (more than 50 employees)



Source: Survey Data.

The findings described above seem to somehow contradict international literature according to which small firms tend to have lower levels of occupational safety and health standards and expose employees to higher risks. Financial constraints, lack of knowledge, adequate skills and awareness are some of the issues which small firms face.²⁷ Nonetheless, it is to be noted that in general, companies surveyed in Indonesia are rather small in size, with 9 of them employing 150 people or less.

4.1.3. Age

Another factor which could account for the different number of injuries suffered by a specific group of employees is age. The average age for all interviewees is 29.7. All interviewees have therefore been divided into two groups, below and above the age of 30.

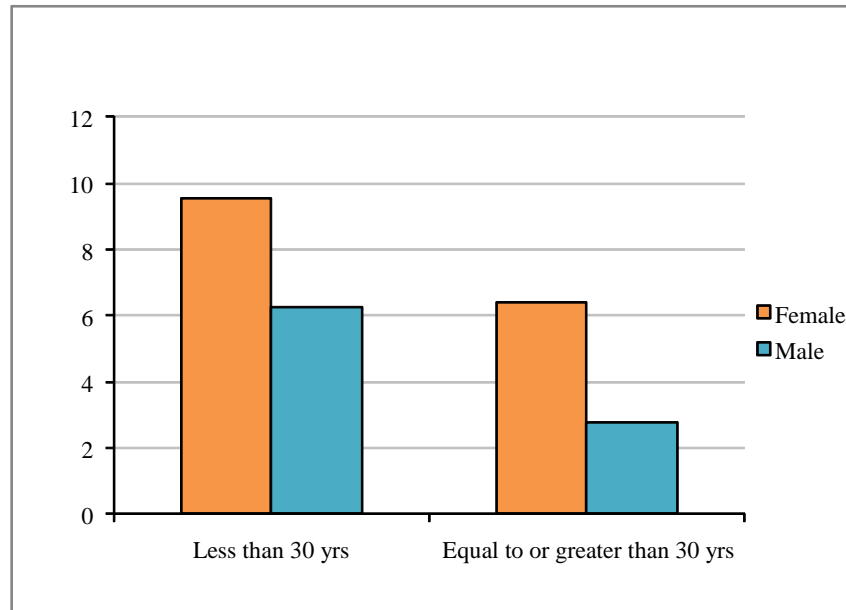
Data analysis shows that on average, employees aged under 30 have experienced 8.24 injuries over the past three years, as opposed to those aged 30 and above who have suffered from 4.85. If we then consider women and men under 30 and aged 30 and above, again, young female employees are more likely than their male counterparts to suffer from injuries. On average, women under 30 have suffered from 9.56 injuries over the past three years, whereas their male

²⁷ See for example: Dimopoulos, V. A. 2007. Effective information assurance with risk management (PH.D. dissertation), (Plymouth UK); and Rautio, S. 1994. Occupational safety and health in the South Pacific – Asian-Pacific Newsletter on Occupational Health & Safety 1(3).

colleagues of the same age group have recorded an average of 6.23 injuries over the same period.²⁸ The following chart clearly illustrates the situation.

Professional experience gained with years of work could be a very helpful element in preventing injuries, which could explain the findings described above. Likewise, career progression linked to age and seniority may transfer employees away from more dangerous positions towards jobs which are safer and less close to practical activities.

Figure 4.2: Work-related injuries suffered by women and men over the past 3 years by age group



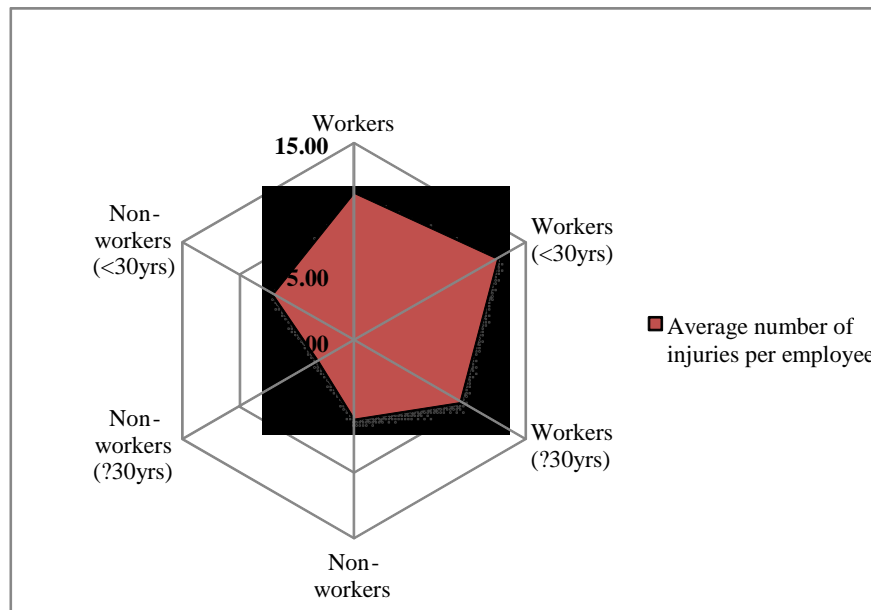
Source: Survey Data.

4.1.4. Being a worker

To find out whether this latter idea may make any sense, all interviewees have been divided into two groups: Those that can be called “workers” and who are more involved in practical activities and production, often entailing the use of machineries, and non-workers including managers, owners, supervisors, administration staff, human resource development, inspectors and quality control staff. If we focus on women, on average, worker women have experienced 11.34 injuries over the past three years, as opposed to female non-workers who have experienced 5.92. Clearly being a “worker” is associated with a higher level of risk to experience an injury. If we then focus on women workers under 30, the average number of injuries suffered over the past three years rise to 12.64, thus showing that being a young female worker exposes an employee to further physical risk.

²⁸ The difference between the two age groups divided by gender is confirmed by a rather high degree of statistical significance (0.00123577 with P=0.05).

Figure 4.3: Injuries suffered by women by age group and worker /non worker status



Source: Survey Data.

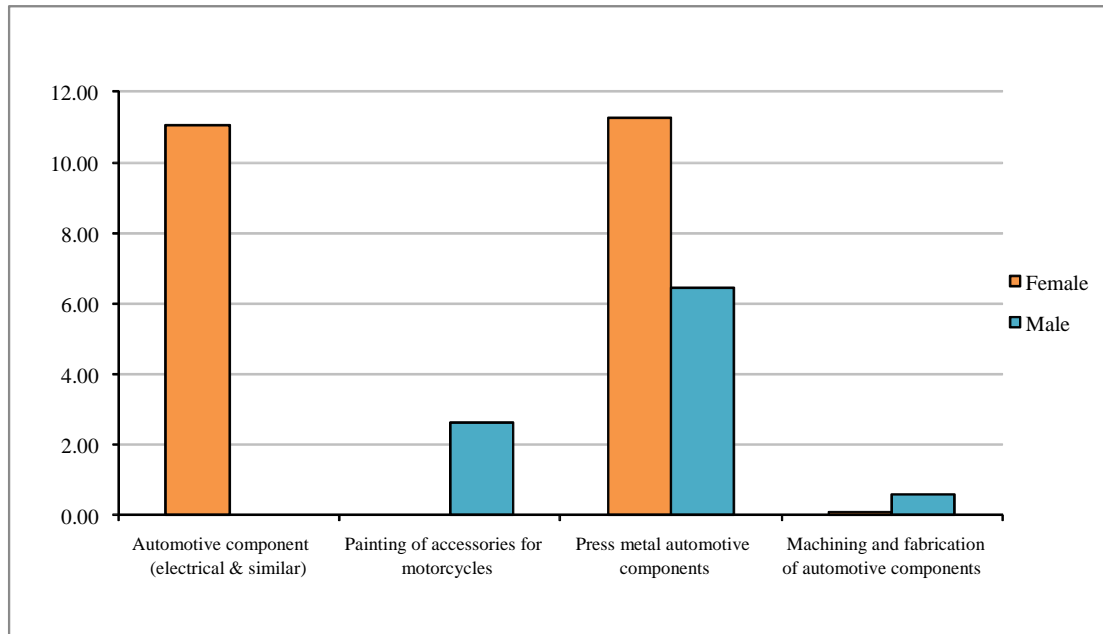
4.1.5. Sector

Enterprises from the very same sector, manufacturing of machine parts, have been chosen the target for the survey described in this paper. However, the higher or lower number of injuries may be linked to the specific type of activity of each company. The 10 Indonesian firms have therefore been divided into sub-sectors depending on the specific type of activity performed: Automotive components (electrical and similar), painting of accessories for motorcycles, press metal for automotive components (and similar), and machining and fabrication for automotive components.

As the following chart shows, injuries are concentrated in sector 1 (Automotive components – electrical and similar) with an average of 8.85 injuries over the past 3 years, and sector 3 (press metal for automotive components and similar) with an average of 8.48 over the same period. If we break down data by gender, interestingly we can see that all injuries for firms operating in automotive components (electrical and similar) have occurred to women, whereas those which affected employees in companies operating in painting of accessories for motorcycles concern men only. Most injuries in machining and fabrication of automotive components have affected men, whereas in firms dealing with press metal for automotive components and similar, most injuries have occurred to women. In this last sub-sector, men have experienced an average of 6.35 injuries over the past 3 years, whereas women have suffered 11.28 over the same period.

It is to be noted that the division of surveyed enterprises into 4 groups makes the smaller groups not particularly representative of their sub-sector. This means that results are to be interpreted with caution.²⁹

Figure 4.4: Work-related injuries by gender and sub-sector over the past 3 years



Source: Survey Data.

4.1.6. Concluding remarks on Indonesia

It can be concluded that in the Indonesian surveyed firms women employees are more likely than their male counterparts to suffer injuries. The answer to the first research question is therefore that they are more exposed to occupational safety and health risks than men. The situation is worse for women who are under 30, who are workers, and employed either in the “automotive components (electrical and similar)” sub-sector or in the “press metal for automotive components and similar” one. The following chart sums up these findings.

²⁹ Nonetheless, after testing the hypothesis on whether the distribution of injuries is proportional amongst sectors and gender groups, with P set at 0.05, we obtain a very high statistical significance level equal to 2.31814E-34 which confirms the disproportional distribution of injuries.

Figure 4.5: Average of work related injuries over the past 3 years for women by significant categories



Source: Survey Data.

4.1.7. China

Over the past 3 years, surveyed companies have recorded a total of 88 injuries among their employees. Surprisingly, unlike in the case of Indonesian interviewees, Chinese surveyed employees report having suffered from far fewer injuries than those officially recorded by their employers. They reveal having experienced only 4 injuries in total over the same period of time.

This interesting finding may be due to the fact that the employees selected by the companies to be interviewed are those who have not experienced many injuries.

In addition, the selected sample of interviewees is less representative for China than it was in the case of Indonesia. As a matter of fact, most Chinese surveyed firms employ more than 250 people, whereas Indonesian surveyed companies are overall smaller in size.

Moreover, one cannot exclude that the different cultures may determine a higher degree of openness of Indonesian interviewees as compared to Chinese ones in revealing what could cause problems with their employers. The fact that the number of accidents witnessed by Chinese employees (see section 4.2) is much higher than the number of injuries suffered may be seen as supporting this idea.

All 4 injuries were suffered by men, of whom 2 were workers and 2 were line supervisors. Considering the overall low number of injuries, it is deemed unnecessary to investigate on the size and sub-sector of the enterprises where those male workers are employed, or on further personal characteristics of those employees.

The answer to the first research question is that women working in the manufacturing of machine-parts sector in China are not more exposed to occupational safety and health risks than men. It can be added that the overall low number of injuries leads to the conclusion that for all employees, occupational safety and health risks are not high.

4.2. Is machinery/equipment adjusted to women?

This question has been addressed by considering the number of accidents due to a machine/equipment which is hard to use for a worker.

Following the ILO Convention and Recommendation concerning Benefits in the Case of Employment Injury, No. 121, both adopted in 1964, Work accidents can be defined as accidents occurring at or in the course of work which may result in death, personal injury or disease.

Accidents may have a negative impact on the environment and this is why they are being considered in this research. If they are caused by machines and/or equipment which are hard to use, in particular for a female worker, a direct link between gender and the environment can be established.

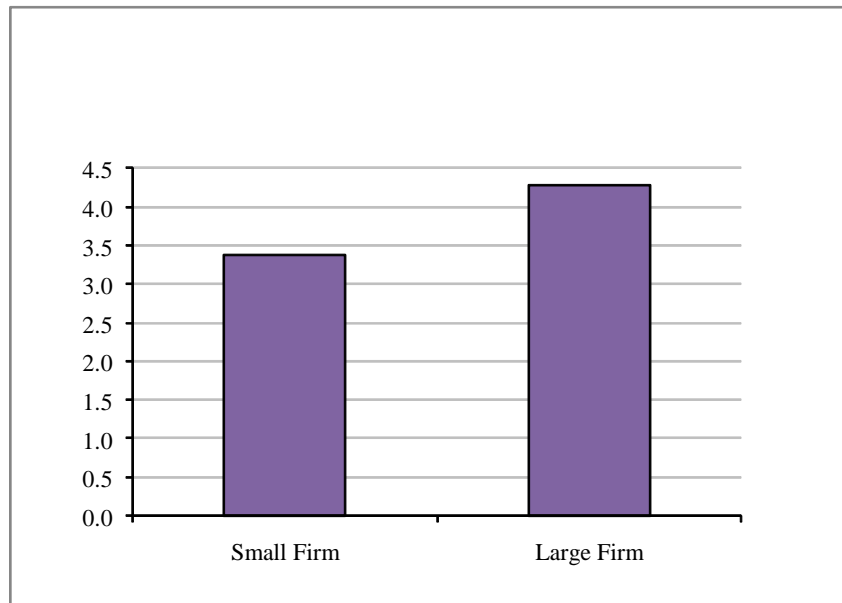
4.2.1. Indonesia

Surveyed companies In Indonesia have recorded 45 accidents. The picture is quite different according to interviewees who, over the same period, have witnessed a total of 401 accidents caused by a machine/equipment which was hard to use for a worker. Since interviewees were asked to report on witnessed accidents, such a high total number may be due to the same accident being reported by more than one employee. However, the low number of accidents reported by firms is particularly striking because such number should include all kinds of accidents and not only those which are due to a machine/equipment which is hard to use for a worker.

4.2.2. Size of the enterprise

As for injuries, the larger size of enterprises seems to be a factor determining a higher level of accidents in Indonesia. As a matter of fact, over the past three years, an average of 3.4 accidents due to a machine/equipment which was hard to use for a worker have been witnessed in firms employing 50 people or less as opposed to an average of 4.3 witnessed in larger companies over the same period. The difference is however not so relevant. Figure 4.6 illustrates these findings.

Figure 4.6: Accidents due to machine/equipment difficulty of use, over the past three years in small enterprises (50 employees or less) and large enterprises (more than 50 employees)



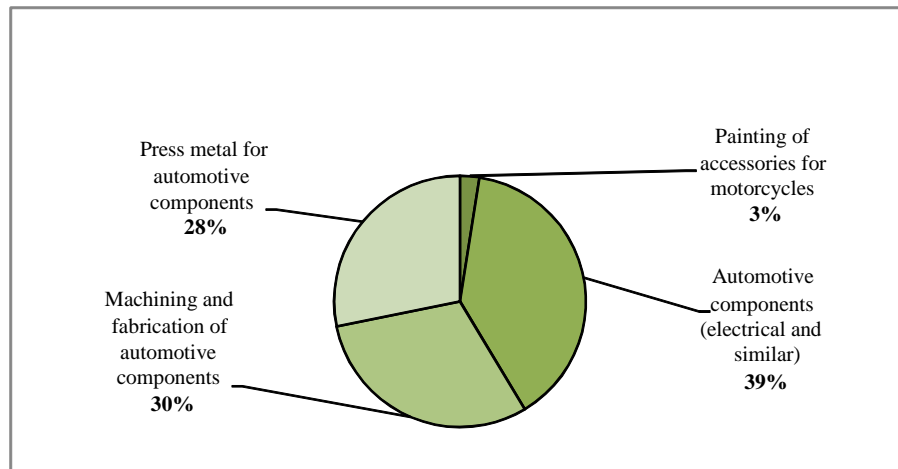
Source: Survey Data.

4.2.3. Sector

Considering accidents witnessed by sub-sector, as figure 4.7 indicates, sectors 1, 4 and 3 record the highest number of witnessed accidents. “Automotive components (electrical and similar)” registers 156 over the past 3 years, “machining and fabrication of automotive components” records 122, and “press metal for automotive components and similar” follows with 113 over the same period.

The trend of injuries by sub-sector is only partially confirmed by data on accidents. As a matter of fact, only “automotive components (electrical and similar)” presents both a high number of injuries and a significant share of accidents. Sub-sector “press metal for automotive components and similar” reveals a very important number of injuries, but does not register an equally relevant number of accidents. The trend is reversed for “machining and fabrication of automotive components” which records a higher number of accidents than of injuries. These findings seem to show that there is not necessarily a direct relation between injuries and accidents, and that the two phenomena have different causes and a distinct nature in Indonesian firms.

Figure 4.7: Share of accidents due to machine/equipment difficulty of use, witnessed over the past three years by sub-sector



Source: Survey Data.

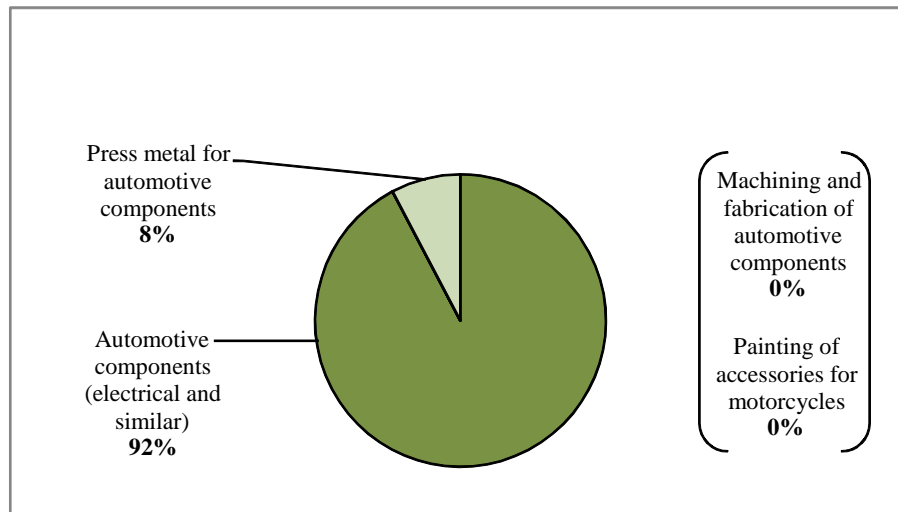
4.2.4. Gender

Out of the 401 total witnessed accidents in Indonesian companies, 117 happened because a female worker found it hard to use a machine/equipment. As the following chart indicates, they are concentrated exclusively in two sectors: “automotive components” (electrical and similar), and “press metal for automotive components and similar”. There is then a striking difference in the distribution of accidents between the two sectors. As a matter of fact, almost all accidents (108) have occurred in the “automotive components” (electrical and similar) sector, with only 9 in the other one.

If we compare the gender distribution of injuries and that of accidents in Indonesian enterprises, we can again observe a different trend. Most injuries affected women, whereas the large majority of accidents due to a machine/equipment being difficult to use concern male workers rather than females. Less than 30 per cent (29.17 per cent) of accidents were caused by a machine/equipment which was hard to use for a female employee.

If we then consider data on a sub-sectoral level, “automotive components (electrical and similar)” reveals a rather worrying situation. All the injuries recorded concern women, and this sub-sector also registers the highest number (108 out of a total of 117) of accidents due to a machine/equipment which is hard to use for a female worker. The number of both injuries and accidents is extremely high compared to other sectors. The enterprises which fall under this sub-sector employ respectively 51-150 people in one case, and 50 or less in the other.

Figure 4.8: Share of accidents due to machine/equipment difficulty of use, witnessed over the past three years for sector



Source: Survey Data.

4.2.5. Concluding remarks on Indonesia

Judging from the findings presented in this section, we cannot conclude that machines or equipment are not adjusted to women workers in Indonesia. Accidents due to a machine/equipment which are hard to use for a worker do happen, but they concern more male employees than female ones. This could be due to the small size of men which could make machinery difficult for them to use.

One issue which clearly emerges from the survey in Indonesia is that out of the 100 employees who have been interviewed, only a woman working on human resource development has received training on use of equipment, safety procedures, and risk aspects of her occupation, and none have benefited from any training on handling of chemicals and dangerous air and water emissions. The provision of adequate training could improve the situation both in terms of injuries which could be due to poor safety equipment and procedures, and in terms of preventing accidents caused by machines/equipment which are hard to use for workers, both men and women alike.

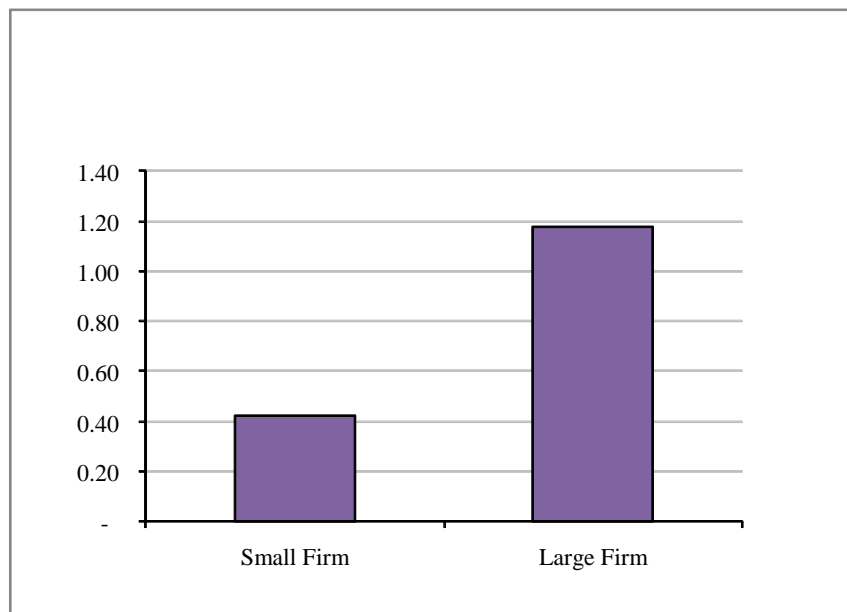
4.2.6. China

Chinese surveyed companies have recorded 79 accidents over the past 3 years. Interviewees have witnessed a total of 98 accidents caused by a machine/equipment which was hard to use for a worker over the same period. Despite the fact that accidents recorded by companies include all kinds of accidents, whereas interviewees reported only on accidents due to a machine/equipment being hard to use for a worker, the two figures are not incompatible, since, as already mentioned, employees may have witnessed and reported on the same accident which would then be counted more than once.

4.2.7. Size of the enterprise

Like in Indonesia, also in China, the smaller size of enterprises does not seem to be a factor determining a higher level of accidents due to a machine/equipment which is hard to use for a worker. As a matter of fact, over the past three years, 11 accidents have been witnessed in firms with 250 employees or less and 87 in enterprises employing more than 250 people. The average number of witnessed accidents over the past 3 years in smaller firms is 0.42 compared to 1.17 in larger ones. Overall, the number of witnessed accidents due to a machine/equipment which is hard to use for a worker is low. Figure 4.9 illustrates these findings.

Figure 4.9: Accidents due to machine/equipment difficulty of use, over the past three years in small enterprises (250 employees or less) and large enterprises (more than 250 employees)

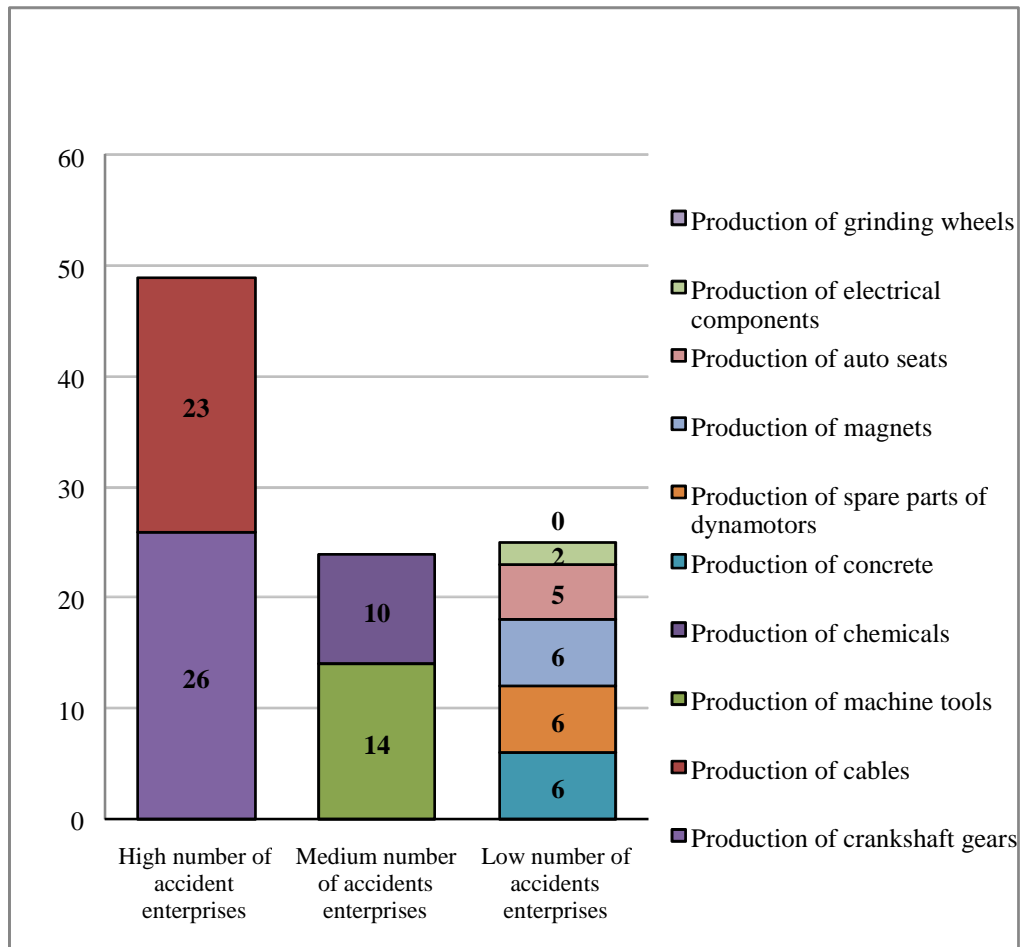


Source: Survey Data.

4.2.8. Sector

It has proven difficult to divide the 10 Chinese surveyed enterprises into sub-sectors, because each one of them focuses on a very specific area. If we then maintain the type of activity of each one of them as such, we can observe that most accidents due to a machine/equipment which is hard to use for a worker have been witnessed in firms dealing with the production of crankshaft gear and with the production of cables. In these two enterprises interviewees have witnessed 26 and 23 accidents respectively over the past 3 years. The 2 enterprises operating in the production of chemicals and in the production of machine tools record 10 and 14 witnessed accidents respectively. Only the company dealing with the production of grinding wheel has registered no witnessed accident due to a machine/equipment which is hard to use for a worker over the past 3 years. Figure 4.10 shows these findings

Figure 4.10: Enterprises grouped by number of witnessed accidents due to machine/equipment difficulty of use, witnessed over the past three years



Source: Survey Data.

4.2.9. Gender

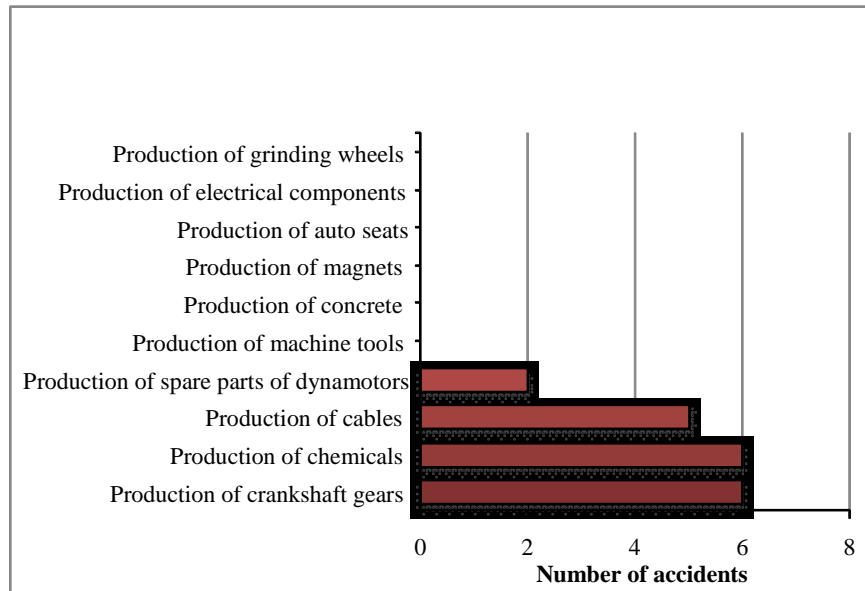
Out of the 98 total witnessed accidents in Chinese enterprises, 19 happened because a female worker found it hard to use a machine/equipment. As Figure 4.11 indicates, they are concentrated in 4 enterprises operating in the production of crankshaft gears, spare parts of dynamotors, cables, and chemicals. Interestingly, once more the smaller size of the enterprise does not seem to play any significant role, given that these 4 firms employ more than 250 people.

The large majority of accidents due to a machine/equipment which is hard to use concern male workers rather than females. Less than 20 per cent (19.38 per cent) of accidents were caused by a machine/equipment which was hard to use for a female employee.

The number of witnessed accidents due to a machine/equipment which was hard to use for a female worker over the past 3 years tends to reflect the trend of witnessed accidents by area of production discussed above. As a matter of fact, as indicated in figure 4.12, enterprises operating in the production of crankshaft gear, cables, and chemicals record high numbers of witnessed accidents both in

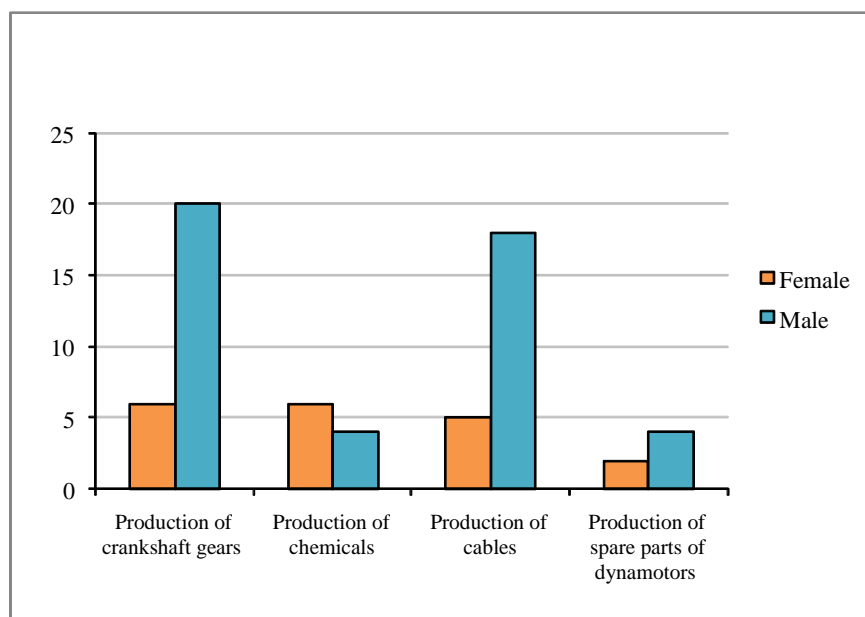
general and for women in particular. In 2 of the 3 production areas most accidents witnessed over the past 3 years concern men more than women. Only in the firm dealing with the production of chemicals are there slightly more accidents witnessed for women than there are for men (6 for women and 4 for men).

Figure 4.11: Accidents due to machine/equipment difficulty of use, witnessed over the past three years for women workers by production area



Source: Survey Data.

Figure 4.12: Accidents due to machine/equipment difficulty of use, witnessed over the past three years by gender and selected production area



Source: Survey Data

4.2.10. Concluding remarks for China

Judging from the findings presented in this section, we cannot conclude that machines/equipment are not adjusted to female workers in China. Accidents due to a machine/equipment which is hard to use for a worker do happen, but they concern more male employees than female ones. This could be due to the small size of men which makes machinery difficult for them to use.

Unlike in the case of the surveyed employees in Indonesia, the large majority of interviewees in China have received training both on use of equipment, safety procedures, and risks aspects of their occupations, and on handling of chemicals and dangerous air and water emissions. This may account for the lower number of injuries suffered and witnessed accidents due to a machine/equipment which is hard to use for a worker. The following is an attempt to understand to what extent this is true.

4.2.11. Impact of training

Out of the total 100 Chinese interviewees, only 3 have not benefited from any training on use of equipment, safety procedures, and risks aspects of their occupations. These 3 individuals are women. If we consider that the 4 employees who reported having suffered from an injury over the past 3 years are men, we can conclude that training in this area may certainly have contributed to the overall low number of injuries experienced, but did not prevent those 4 male employees from being injured. It is also not possible to know whether those 4 individuals were trained before or after they were hurt.

As far as training on handling of chemicals and dangerous air and water emissions is concerned, the picture is quite different. Only 19 interviewees out of 100 have received training in this area. Perhaps this type of training is specific to certain tasks and jobs, and it is not necessary for just any employee to be familiar with such practices.

It seems however important that those who are employed in the production of chemicals receive this type of training. Of the 10 interviewees who work in this area, 4 have been trained. None of them have experienced any injury over the past 3 years. However, the company operating in this area has recorded 3 injuries and 2 accidents over the past 3 years. In addition, the number of witnessed accidents due to a machine/equipment which is hard to use for a worker falls in a medium range, as already indicated in Figure 4.10 above.

The distribution of the other employees who have been trained in handling of chemicals and dangerous air and water emissions does not show any significant finding.

Available data does not allow any firm conclusion to be drawn about the impact of training on injuries and accidents due to a machine/equipment which is hard to use for a worker. If we compare data on injuries and witnessed accidents in China to those on Indonesia, it is likely, but not supported by concrete evidence, that training strongly contributed to lower numbers. Stricter rules and regulations could be another factor accounting for the better performance of Chinese companies compared to Indonesian ones in this regard. In China, OSH legislation was introduced already in 1929 with the adoption of the "Factory Law", and a new OSH system was developed in the country as of the late 1970s

to meet the challenge of an increasingly expanding SME sector.³⁰ In addition, since the 1990s, the OSH inspection system has been strengthened.³¹

It is also to be noted that, considering the higher quality of data provided by the survey conducted in China to address the next research question as opposed to the survey in Indonesia, one may conclude that training may have increased the level of awareness of interviewees about the environmental impact of their jobs.

4.3. Are women assigned more housekeeping tasks and environmental protection measures than men in firms?

As already anticipated in section 3 on methodology, finding an appropriate question to address this issue was a real challenge since the phase of questionnaire design. Every single job may have negative impacts on the environment and, at the same time, include tasks which have beneficial environmental effects. In principle, employees should receive training in order to know what the positive and negative environmental impacts of their jobs are, but this is rarely done.

Shedding some light on what is meant by “housekeeping” at the workplace may help understand the difficulties encountered in the formulation of an appropriate question. According to the Canadian Centre for Occupational Health and Safety, “housekeeping” includes:³²

- keeping work areas orderly;
- maintaining halls and floors free of slip and trip hazards;
- removing of waste materials and other fire hazards from work areas;
- paying attention to the layout of the whole workplace;
- checking aisle marking;
- ensuring the adequacy of storage facilities; and
- taking care of maintenance.

The same source adds that good housekeeping is a basic part of accident and fire prevention.

In order to measure housekeeping tasks and environmental protection measures, several options were proposed to interviewees. These include being in charge of cleaning, maintenance of machines, waste collection and disposal,

³⁰ Jin, K.; Courtney, T.K. 2009. Work-related fatalities in the People’s Republic of China. *Journal of Occupational and Environmental Hygiene*, 6(7).

³¹ Chunchang, S. 1994. Boiler and pressure vessels inspection in China. *Asian-Pacific Newsletter on Occupational Health and Safety*, December, 1(3).

³² <http://www.ccohs.ca/oshanswers/hsprograms/house.html>

security control, noise level control, receiving complaints from outside and inside the company on environmental or health issues, transport, storing, labelling, and specific production task. Interviewees were also given the option of adding any other specific environmental task.

4.3.1. Indonesia

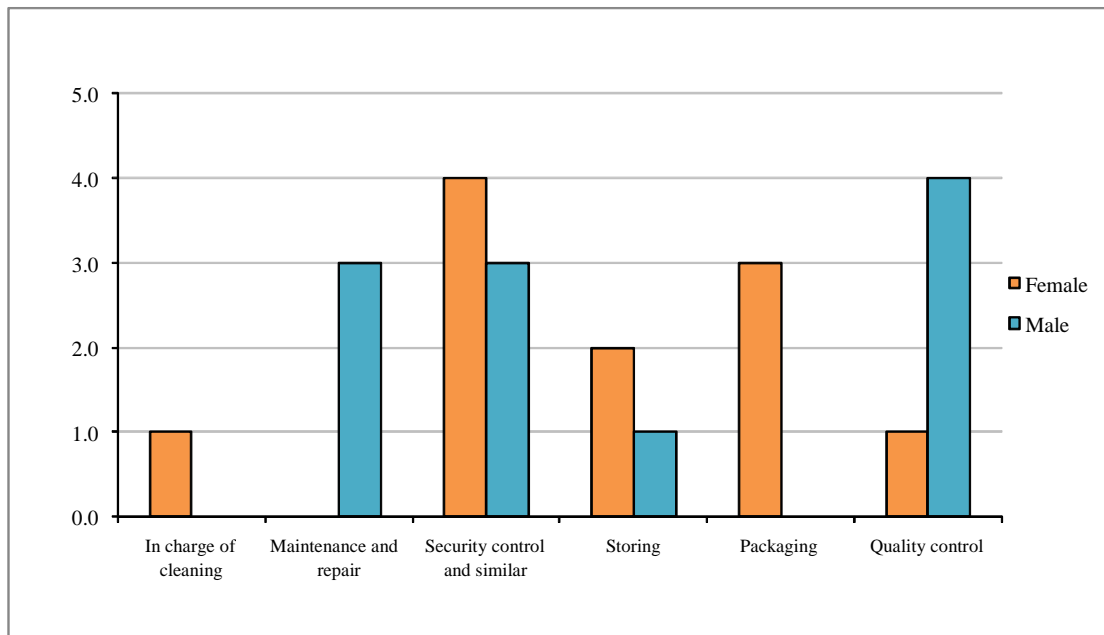
As observed in the previous section, neither male nor female Indonesian interviewees have received any training on the environmental impacts of their jobs.

The lack of general awareness of the fact that every job has some environmental impact has resulted in answers which offer scarce information to properly address this research question. If on one hand a clear list of environmental/housekeeping tasks was offered in the questionnaire, many interviewees chose the option “Other (please specify)” and gave a brief description of their job with no environmental connotation.

Out of 100 answers, 27 describe jobs in the administration, human resource development or other similar areas where it is not possible to find any clear linkage with the environment. In addition, 51 interviewees chose the option “Production (please specify)” and gave a description indicating exactly their function where again, no clear connection with the environment can be easily identified. Only 22 answers can therefore be considered to try and address the issue of whether women are assigned more housekeeping tasks and environmental protection measures than men.

As shown in Figure 4.13, those 22 employees can be grouped by gender and under 6 categories of environmental tasks: “in charge of cleaning”, “maintenance and repair”, “security control and similar”, “storing”, “packaging” and “quality control”. Ten environmental tasks were listed in the questionnaire among which interviewees could choose, but only 4 of those options were selected. Two categories can be added to the list based on the specifications provided by interviewees. These are “quality control” and “packaging”.

Figure 4.13: Employee's performing environmental tasks by gender and category in Indonesia



Source: Survey Data.

Of the total 22 employees performing some environmental tasks, 11 are men and the same number are women. If we then consider the gender distribution by category, 4 women and 3 men are involved in tasks concerning “security control and similar”. Only one female employee is in charge of “quality check” as opposed to 4 men. In general, control functions seem to be the most performed environmental tasks.

Three women are involved in packaging and 3 men in maintenance and repair, and 2 women and only one man are in charge of storing.

One may conclude that there is no difference in the assignment of housekeeping tasks and environmental protection measures to women and men. However, the information available is very scarce and does not allow any firm conclusion to be drawn.

4.3.2. China

Chinese interviewees seem to have a better understanding of the type of environmental tasks that their jobs entail compared to Indonesian interviewees.

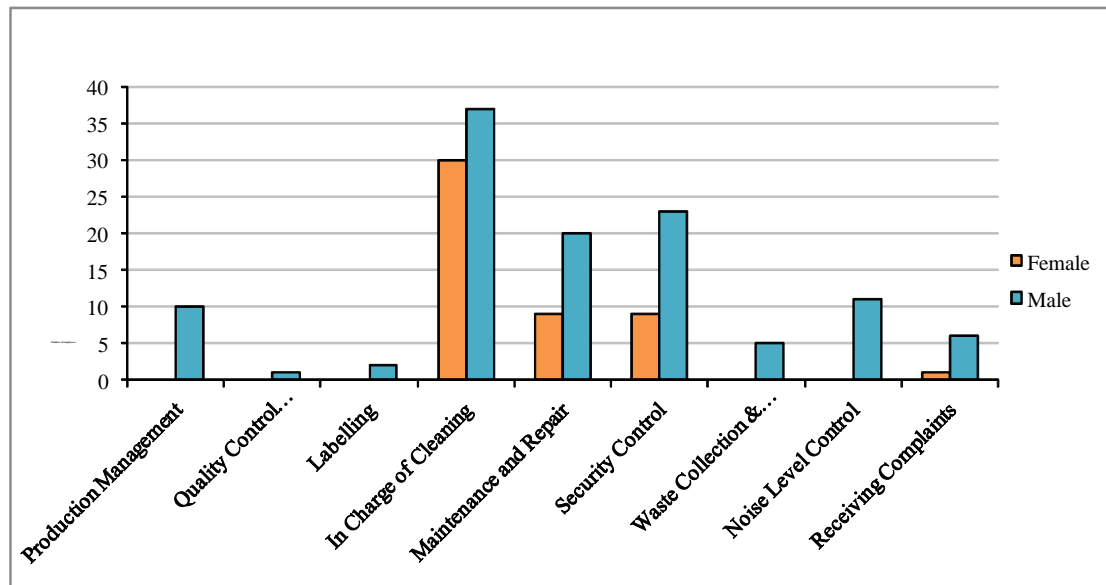
Several Chinese interviewees chose up to 3 of the 10 options which were offered in the questionnaire for environmental tasks. Moreover, a few interviewees added a couple of new categories, which are “production management” and “quality control management”. Three of the proposed tasks were completely ignored. These are “transport”, “storing” and “production (please specify)”. Interestingly, a male driver ignored “transport” for an option and opted for “in charge of cleaning”.

A total of 164 environmental tasks have been chosen by interviewees as tasks they perform in their job to protect the environment. Those tasks can be divided by 9 categories, as described above, and by gender.

Women are 34 in number and they chose a total of 49 environmental tasks. Men are 66 and totalled 115 environmental tasks.

As the chart below shows, there is a striking difference in the range and variety of environmental tasks performed by men as opposed to those performed by women. Female interviewees are certainly fewer than their male counterparts, but they selected only 4 types of environmental tasks as opposed to the 9 (more than double) which have been chosen by men.

Figure 4.14: Employee's performing environmental tasks by gender and category in China

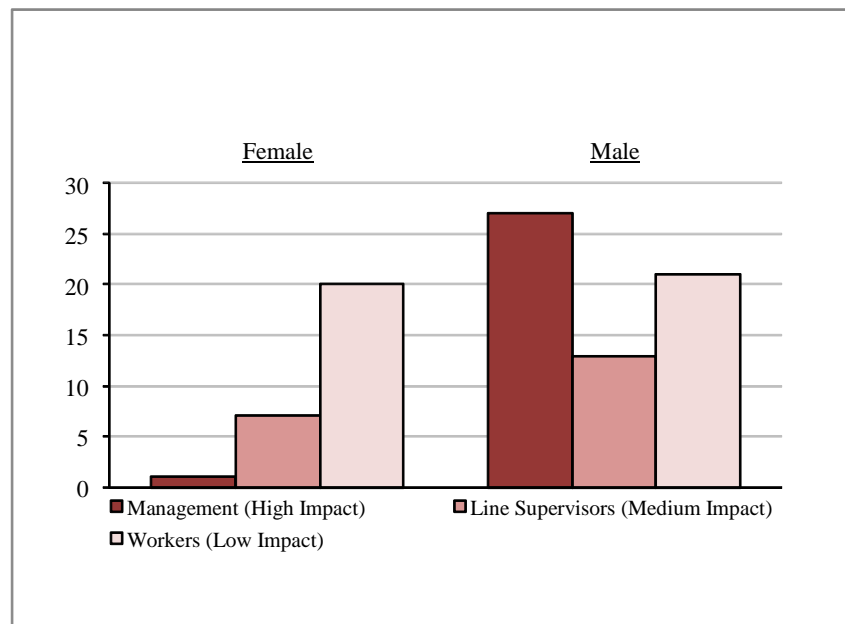


Source: Survey Data.

If we then consider the specific content of the tasks selected, women tend to be relegated to low-level jobs. For instance, although in the chosen sample women number one third of the sample size, they have opted for cleaning tasks 30 times, whereas men have chosen that option 37 times.

Unlike women, a large share of men seem to be in management positions with environmental tasks having a direct impact on the environmental behaviour of other colleagues. For example, 10 male interviewees are in production management positions, where they can play a pivotal role in environmental protection measures by determining the behaviour of employees operating in their production area. Figure 4.15 shows the level of environmental impact based on positions held by men and women. Clearly, since they have more influential jobs, men have a much more important role to play than women in environmental protection.

Figure 4.15: Employees grouped into positional categories according to degree of environmental impact by gender



Source: Survey Data (Those interviewees whose positions were classified as “other” are excluded from this chart).

Unlike in the case of Indonesia, a good number of employees are in charge of noise level control (11 men) and of receiving complaints from outside and inside the company on environmental or health issues (6 men and 1 woman). This certainly indicates much greater attention to environmental protection in the firms surveyed in China as opposed to those considered in Indonesia, where no interviewee seems to be performing the environmental tasks of “noise level control” and “receiving complaints”.

A high and proportional number of men and women are involved in maintenance and repair tasks (20 men and 9 women). The proportional distribution of this environmental task is certainly linked to the rather medium level of responsibility it entails, which is attainable both for women and for men in terms of career development.

Another environmental task which is more or less proportionally performed by men and women is “security control” (23 men and 9 women). A relatively high number of women and men perform this and similar tasks also in the firms surveyed in Indonesia, indicating that this is a relevant environmental task linked to jobs entailing a medium level of responsibility.

The survey in China provides a clear answer to the research question “are women assigned more housekeeping tasks and environmental protection measures than men?” The answer is negative, because those environmental tasks with a stronger impact on the environment are performed by men. The objective of this survey is not to show that women perform better than men in environmental tasks. Based on the literature review presented in section 2.3, we take it for granted that women have potential to contribute more than men to environmental protection. What the findings of the present research indicate is that even if women are better than men in the implementation of environmental

protection measures, they are denied a chance to show it, because they are absolutely under-represented in management positions, and it is by being in top-management jobs that one can make a difference in environmental protection.

5. Conclusion and recommendations

The research which the present paper has described provides for empirically-based answers to the three initial research questions. To sum up:

- **Are women exposed to greater occupational safety and health risks than men?**

According to findings from the survey in Indonesia, it is clear that women experience considerably higher occupational safety and health risks than their male counterparts. These results conflict with national statistical data from different countries, as shown in Table 2.1. It is to be noted, though, that statistical data on the manufacturing sector in general may not reflect the specific situation of the manufacturing of machine-parts sub-sector. Unfortunately, national data for Indonesia is unavailable. It is therefore preferable to consider these findings as valid for SCORE enterprises only, and in particular for those which were surveyed in Indonesia. In general, more investigation is needed in this area, because, as described in section 2.1, injuries and accidents do entail costs and productivity losses.

Data on China show an overall low level of occupational safety and health risk for both female and male employees. Factors contributing to this better situation include training and possibly strict and enforced regulations, but also the difficulties which employees encounter in disclosing information and the barriers that companies erect, preventing their staff from disclosing sensitive data.

- **Is machinery/equipment adjusted to women?**

Findings from both Indonesia and China reveal that machineries and equipment are adjusted to women. Accidents which occur due to machineries/equipment which are difficult to use for a worker affect men more than women. This could however be due to the small stature of male employees which makes machinery difficult for them to operate.

- **Are women assigned more housekeeping tasks and environmental protection measures than men in firms?**

To answer this question we must rely on data from the survey in China. The answer is negative, because those environmental tasks with a stronger impact on the environment are performed by men. Even if women are better than men in the implementation of environmental protection measures, as the international literature clearly indicates, they are simply denied a chance to show it, because they are under-represented in management positions and it is by being in top-management jobs that one can make a difference in environmental protection.

This result has direct implications in terms of missed opportunities in productivity gains. If women were in management positions, the international literature presented in section 2.3 suggests that enforcing environmental management systems would cost less thanks to the higher degree of women's voluntary compliance.

Some research areas which emerge from the present work and deserve future attention include:

- Understanding why data on injuries for women and men in Indonesia SCORE enterprises in the manufacturing of machine-parts sub-sector contradict international data trends on the manufacturing sector.
- Shedding light on the nature of injuries suffered by women in SCORE enterprises.
- Verifying whether machines are indeed adjusted to small men and women.
- Understanding whether there are any specific issues concerning young employees.
- Identifying approaches and measures for the promotion of women in management positions in a sector which is traditionally dominated by men.

Different recommendations ought to be made for each one of the two countries.

For China, a major issue is the promotion of career progression for women. Manufacturing of machine parts is traditionally a male-dominated area. However, the advancement of women in management positions would certainly improve the performance of Chinese companies in the area of environmental protection, and would entail productivity gains and lower costs.

A striking result of the survey in Indonesia is that there is a remarkable difference between injuries and accidents reported by firms and those suffered and witnessed by employees. One can make all sorts of assumptions about why this is the case, including the fear of employees to lose their jobs if they tell the truth to management and the bad reputation which companies may acquire from reporting a high number of injuries and accidents. Regardless of the explanation, what really matters is that top management should be at least aware of the real situation as well as of the remedies which can be adopted.

Training on occupational safety and health (OSH) standards is a key priority to improve the working conditions of employees in Indonesian enterprises. Training should cover and perhaps focus on use of equipment, safety procedures, and risks aspects of occupations, and on handling of chemicals and dangerous air and water emissions. The provision of adequate training could improve the situation both in terms of injuries which could be due to poor safety equipment and procedures, and in terms of preventing accidents caused by machines/equipment which are difficult to use for workers.

General training should be offered to all staff, regardless of their specific positions. It is important that all employees, including top managers, are aware of the positive and negative environmental impacts that their respective jobs may have. This is also a requirement of the International Organization for Standardization and its ISO 14001 on environmental management systems.

Specific courses should be developed for those target groups who suffer more injuries and accidents than others, as emerging from the survey in Indonesia. Such target groups include women in particular and some sub-sectors, such as “automotive components (electrical and similar)”, and “press metal for automotive components”.

For both countries, it is strongly recommended to undertake another survey based on the same questionnaire on an annual basis, especially after training courses have been organized in Indonesia. Regular surveys would help monitor the situation and measure the effectiveness of the remedies which have been chosen and introduced.

Given the relatively poor results obtained in the attempt to answer the third research question on whether women are assigned more environmental tasks and environmental protection measures than men in Indonesia, it is suggested to urgently introduce training courses to make employees aware of the environmental impact of their jobs. This would allow receipt of appropriate answers to question 9 in future surveys of this kind. The question could otherwise remain in the questionnaire, but for enriching and complementing information to address the other two research questions.

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Appendix A

Questionnaire on Gender, Safety and Environment

(Questionnaire for one SCORE Enterprise)

The number of employees to be interviewed is 10 per cent in each enterprise, but with a maximum of 10 per company. Consultants should pay special attention to balance the gender composition of interviewees. If possible, up to 20 per cent of interviewees from each firm should be women.

Part I

This section must be completed by the consultant before asking Part II questions to employees:

1. Country of the enterprise _____
2. Sector of the enterprise _____
3. Enterprise with:
 - a) 50 workers or less;
 - b) 51-150 workers;
 - c) 151-250 workers;
 - d) 251 workers or more.
4. Number of injuries recorded by the company over the past 3 years _____
5. Number of accidents recorded by the company over the past 3 years _____

Part II

This part of the questionnaire is to be filled in by the consultant through a one-to-one personal interview with employees:

6. Sex _____;
7. Age _____;
8. Please indicate your occupation/function by choosing one or more of the following options:
 - a) Top management/Owner
 - b) Middle management
 - c) Line supervisor
 - d) Non-management position
 - e) Other (please specify) _____

9. Please indicate the type of environmental tasks you have performed in your job by choosing one or more of the following options:
- a) Being in charge of cleaning;
 - b) Maintenance of machines;
 - c) Waste collection and disposal;
 - d) Security control;
 - e) Noise level control;
 - f) Receiving complaints from outside and inside the company on environmental or health issues;
 - g) Transport;
 - h) Storing;
 - i) Labelling;
 - j) Production task (please specify);
 - k) Other (please specify) _____

10. How many *employment injuries*³³ have you suffered over the past 3 years?

11. How many *work accidents*³⁴ have you witnessed that happened because the machine/equipment was hard to use for a worker?

12. In how many of those cases were the worker a woman?

13. Since you started your current job, have you received any training on use of equipment, safety procedures, and risks aspects of your occupation?

14. Since you started your current job, have you received any training on handling of chemicals and dangerous air and water emissions?

³³ Following the ILO Convention and Recommendation concerning Benefits in the Case of Employment Injury, No. 121, both adopted in 1064, we define *employment injuries* as all injuries resulting from accidents arising out of or in the course of employment (industrial accidents and commuting accidents) and all occupational diseases;

³⁴ Following the ILO Convention and Recommendation concerning Benefits in the Case of Employment Injury, No. 121, both adopted in 1064, we define *Work accidents* as accidents occurring at or in the course of work which may result in death, personal injury or disease.

Appendix B:

Number of Indonesia employees in surveyed companies, by gender				
Firm	Sector	Male employees	Female employees	Total employees
1.	Automotive component (electrical & similar)	96	18	114
2.	Automotive component (electrical & similar)	39	11	50
3.	Painting of accessories for motorcycles	38	2	40
4.	Press metal automotive components	116	4	120
5.	Press metal automotive components	32	32	64
6.	Press metal automotive components	35	5	40
7.	Press metal automotive components	43	16	59
8.	Press metal automotive components	191	21	212
9.	Machining and fabrication of automotive components	105	5	110
10.	Machining and fabrication of automotive components	53	5	58

Number of Chinese employees in surveyed companies, by gender

Firm	Sector	Male employees	Female employees	Total employees
1.	Production of auto seats	289	178	467
2.	Production of electrical components	262	83	345
3.	Production of grinding wheels	62	18	80
4.	Production of concrete	94	10	104
5.	Production of crankshaft gears	1,390	392	1,782
6.	Production of spare parts of dynamotors	464	379	843
7.	Production of cables	-	-	<not specified>
8.	Production of chemicals	-	-	<not specified>
9.	Production of magnets	103	105	208
10.	Production of machine tools	-	-	<not specified>

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