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**The Work of Research in Development: An Impact Assessment of IDRC-Supported
Occupational Health and Safety Projects**

Submitted to Gilles Forget

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TABLE OF CONTENTS

1. Introduction	1
1.1 Impact Assessment	1
1.2 IDRC-Supported Occupational Health and Safety Projects	3
2. Occupational Health and Safety in Development: Historical and Institutional Context	4
2.1 Background to Occupational Health and Safety	4
2.2 Occupational Health and Safety and Development	6
3. IDRC and Occupational Health and Safety Projects	11
3.1 IDRC's Occupational Health and Safety Projects	11
3.2 IDRC in the Donor Context	18
4. Materials and Methods	21
4.1 Questionnaire	21
4.2 Case Study	22
5. Results and Discussion	26
5.1 Capacity-Building for Individuals and Institutions	26
5.2 Research Output	33
5.3 Policy and Practice Output	38
5.4 Community Development Output	42
5.5 Information System Output	43
5.6 Institutional Arrangements of Research Group	44
6. Conclusion	49
6.1 Reach and Impact of Occupational Health and Safety Projects in Development	49
6.2 Lessons Learned for Future Project Development at IDRC	50
APPENDIX 1: Components and Indicators for Impact Assessment	52
APPENDIX 2: List of IDRC Occupational Health and Safety Projects Examined	55
APPENDIX 3: Questionnaire	57
APPENDIX 4: List of those who were sent and those who responded to the Questionnaire	67
APPENDIX 5: List of People Interviewed and Places Visited for Case Study	75
APPENDIX 6: List of publications resulting from projects (questionnaire and case study)	77

LIST OF FIGURES

Figure 1 Year Projects Began to Receive Funding	13
Figure 2 Geographical Distribution of IDRC-supported OHS Projects	16
Figure 3 Geographical Distribution of Projects Involved in the Analysis of the Questionnaire and Case Studies	25
Figure 4 Project impact on recipient institutions: globally	30
Figure 5 Project impact on recipient institutions: government institutions and universities .	31
Figure 6 Number of scientific publications per project	35
Figure 7 Publications by recipient institutions	36
Figure 8 Publications by region	37
Figure 9 Stakeholder involvement in projects	46

LIST OF TABLES

Table 1 Money Spent on OHS Projects in Total and in HS, Compared to HS Program Appropriations Per Year (1979 - 1995)	14
Table 2 OHS Projects by IDRC Region	15
Table 3 Some Characteristics of OHS Research Projects	17
Table 4 Distribution of Projects by Recipient Institution	18
Table 5 Number of Ongoing Occupational Health Projects Funded by Donors and by IDRC	19
Table 6 Distribution of Questions in Questionnaire by Categories	22
Table 7 Linkages developed by research team through project activities	27
Table 8 The influence of specific stakeholder groups on project success in achieving selected development impacts	47

1. Introduction

This report seeks both to assess the impact of occupational health and safety (OHS) projects supported by IDRC in regards to development in the South and to analyse the key factors that have influenced this impact.

There are two broad questions this assessment seeks to answer. The first question is what type of consequences, if any, have these projects had on the development of the recipients, beneficiaries, and the larger policy and institutional framework of the various Southern countries themselves? The second question is what lessons may be learned for future project development through an analysis of the key factors which have influenced the differential impact of these projects?

In regards to the key factors, it is hypothesized that the type and number of stakeholders involved in the carrying out of the research as well as in the dissemination of the results strongly affects the impact of the IDRC-supported OHS projects. An analysis of how the number and type of stake-holders involved, termed here the "institutional arrangement" in these projects affected their development impact should assist the planning of future projects at IDRC.

1.1 Impact Assessment

The concept of "impact" has been a slippery one in project evaluations at IDRC. Although its definition is straightforward -- "outcomes, effects, results, of the program on the stakeholders" -- it has been difficult to measure the exact role played by the project in these consequences. Instead evaluations within IDRC have tended to be tools related more to improving the performance of the Centre rather than ways to understand the impact of the project on the intended beneficiaries and other stakeholders.¹ Although this type of evaluation serves IDRC well, it does leave unexplored the defining feature of all projects funded by IDRC and of IDRC itself: the consequences for "development."

For purposes of this report, "impact" is operationalised as the intended and unintended development effects of the research on the recipients and beneficiaries. "Recipients" refers to the Principal Investigator (PI), collaborators, and the recipient institution. "Beneficiaries"

¹ For instance, the Evaluation Unit defined itself in its evaluation strategy document of December 1992 as one that "conducts strategic evaluations which address program and policy issues to enhance the performance of the Centre as a whole." This mandate was reaffirmed in the following section on "objectives," the latter being defined in terms of improving the management of research at IDRC, its recipient institutions, and other agencies concerned with research for development. Evaluation Unit, Corporate Affairs & Initiatives Division. 1992. *Evaluation Strategy*. Ottawa: IDRC.

refers to those whom the project intended to assist. "Development effects" refers to the political, economic, and social consequences of the project; or, more specifically, the capacity-building and research output of the recipients and the improvement of the OHS practices and conditions for the beneficiaries. The latter include phenomena such as the improvement of the studied occupational group's health, the greater safety of production processes, the delivery of occupational or other health services, and the overall policy framework concerning OHS.

Defined in this way, "impact" may be broken down into three constitutive components: Capacity-Building of Individuals and Institutions; Research Output; Policy and Practice Output. In addition, given the objectives of a number of the IDRC-supported OHS projects, two further components should be added: Community Development Output, and Information System Output. Each of these five components of the impact assessment will now be examined in more detail (see Appendix 1 for a table presentation of these components and indicators).

Capacity-Building of Individuals and Institutions: This refers to the effects of the IDRC-supported research projects on the following: the research and professional careers of the researchers involved; the capacity and ability of the recipient institution to sponsor more research projects; and the number of OHS projects in the individual countries themselves.

Indicators of this component include:

- further research in the field of OHS by the researchers involved, the recipient institution, and by any other researchers;
- the career trajectory of the researchers involved;
- the type of training carried out and equipment provided by the project; and,
- the linkages created for the researchers and the recipient institution to policy-makers, various occupational groups, and other stakeholders in the field of OHS that may facilitate further research.

Research Output: This refers to the effects of the IDRC-supported research projects within the scientific community.

Indicators of this component include:

- the quality and use of the data and methodologies produced in the research.

Policy and Practice Output: This refers to the effects of the IDRC-supported research projects on the field of OHS in the particular countries including legislation, regulations, the health delivery system, and the specific OHS practices in the project area.

Indicators for this component include the influence of the project on any resulting changes in the following:

- legislation;
- regulatory environment;

- OHS delivery system; and,
- OHS practices in the project area.

Community Development Output: This refers to the effects of the IDRC-supported research projects on the involvement of the occupational group studied in the assessment and enforcement of OHS practices.

Indicators for this component include the influence of the project on:

- any resulting changes in the involvement of the occupational group in the assessment and enforcement of OHS.

Information System Output: This refers to the effects of the IDRC-supported research projects on the improvement of information sources and/or management in OHS.

Indicators for this component include the influence of the project on any resulting changes in the following:

- type of information sources for OHS; and,
- the dissemination of this information.

1.2 IDRC-Supported Occupational Health and Safety Projects

IDRC has funded research projects in the field of OHS from 1979 to 1995. Over this sixteen year period, IDRC has established itself as a significant global funder of OHS research in the context of development. IDRC has supported OHS research projects in 36 developing countries. Some of these projects were carried out by some of the leading scientists in the field today.

Since internal restructuring within IDRC in 1995, support of OHS projects is no longer a current priority in the new programming context. This current hold on funding new projects in this field provides an opportunity to assess the impact of OHS research supported by IDRC and to analyse the strengths and weaknesses of the projects in regards to their effects on development. Such an analysis, in turn, should assist IDRC in future project development in other fields as well as possibly helping to determine future support of projects in OHS in the new programming context at IDRC.

Before examining the specific details about IDRC-supported projects in this field, however, it is best to place them in the larger context of the field of OHS itself and, more specifically, the field of OHS and development. By having a better understanding of this larger context, it is easier to assess the place IDRC has made for itself in this field as well as the specific impacts of the research projects it has supported.

2. Occupational Health and Safety in Development: Historical and Institutional Context

This section provides a brief background to the field of occupational health and safety in development to situate this examination of IDRC-supported research in OHS within a larger historical context.

2.1 Background to Occupational Health and Safety

The baseline definition of Occupational Health and Safety for most contemporary commentators comes from the first session of the joint International Labour Organisation/World Health Organisation (ILO/WHO) Committee on Occupational Health in 1950. The Committee adopted the following definition:

Occupational health should aim at: the promotion and maintenance of the highest degree of physical, mental, and social well-being of workers in all occupations; the prevention among workers of departures from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological equipment and, to summarise: the adaptation of work to man and of each man to his job.

Although this definition was for "occupational health," its inclusion of working conditions and occupational environment makes it suitable for what is now commonly treated as a unified Occupational Health and Safety (OHS).

Emerging out of nineteenth century legislation and social movements during the industrial revolution in Western Europe and North America, the field of OHS expanded globally after World War Two. This is exemplified by both the broad definition above and the fact that the ILO and WHO jointly issued it. These two specialised agencies of the United Nations started to promote OHS in a variety of fora. Such efforts strengthened the on-going growth and diversification of the OHS professions and institutions in Northern countries,² initiated such processes in the newly defined "developing countries," and established what has become today the five ideal mechanisms to implement and promote OHS in countries: the state, services at workplaces, research, education/training, and dissemination of information.³

² For a good overview of the growth of these professions and institutions in the North, see T. Dwyer. 1992. "The Industrial Safety Professionals: A Comparative Analysis from World War I until the 1980s." *International Journal of Health Services* 22 (4):705-727.

³ See, for example, the overlapping emphases in regards to implementing OHS in two entries to the 1983 *Encyclopaedia of Occupational Health and Safety*. 3rd edition. Geneva:

Before turning to look at how these efforts have been pursued and effectuated in developing countries, each of these ideal mechanisms will be briefly examined.

The State has been the fundamental means of promoting OHS in nations since the latter's emergence as a significant field of action last century. Through passing legislation, national policies, and codes of practice, governments (increasingly in consultation with national representatives of employers and workers) have set standards for, and established the means of, enforcing OHS regulations. These cover issues ranging from workers' compensation to public health inspectors. The standards of many of these state initiatives on OHS, if not occasionally the impetus for them, come from the Conventions and Recommendations ratified by the ILO.⁴

Services at workplaces for OHS are most common in large enterprises. The services consist of medical staff, hygienists, and engineers who pro-actively monitor the safety of work sites and the health of workers as well as responding to any accidents, injuries, or sudden occupational hazards. Since the 1960s, there has been a growing involvement of workers in the monitoring of OHS in the workplace through, for example, the formation of health and safety committees comprised of equal representation of workers and managers (along with any OHS professional staff that may be employed at the place of work).⁵ OHS services also can be provided through other means, including through the regular health delivery system.

Research on OHS has become an important means for bringing up-to-date knowledge about occupational hazards and diseases and the causal role played by work practices and the lack of understanding among workers and employers of occupational risks. These studies are carried out by organizations such as scientific institutions, industry associations, professional bodies, social security institutions, employers' associations, trade unions, and government departments. The research serves both larger academic projects and specific demands for practical solutions or recommendations.

Education/Training entails both professional accreditation in the field of OHS and popular edification about pertinent issues. These activities include, among others, the establishment of

ILO: S. Forssman, "Occupational Health," and M. Robert, "Occupational Safety, national policies of."

⁴ Of the 156 Conventions and 165 Recommendations approved by the ILO between 1919 and 1982, 58 conventions and 60 recommendations relate to occupational health and safety and 22 conventions and 21 recommendations concern safety and health in the working environment. I. Khokhlov. 1983. "International Labour Organisation (application of Conventions on occupational safety and health)." *Encyclopaedia of Occupational Health and Safety*. 3rd edition. Geneva: ILO.

⁵ See: L. Parmeggiani. 1983. "Occupational Health Legislation." *Encyclopaedia of Occupational Health and Safety*. 3rd edition. Geneva: ILO; T. Dwyer. op. cit. pp. 715ff.

training courses for OHS professionals, ensuring that OHS procedures are taught in trade courses and medical schools, and the setting up of public or semi-public bodies (e.g. OHS Institutes, National Safety Councils) to both advise and train employers and workers about occupational hazards and safety.

Dissemination of Information interconnects all the above means of implementation of OHS. It is commonly assumed by OHS proponents that all relevant information emerging from research and from legislation and codes of conduct should be brought to the attention of everyone involved in accident and occupational disease prevention at national and workplace levels. There are several international compilers and disseminators of information on OHS as well as an increasing number of national OHS information centres throughout the Third World.⁶

These five interconnected mechanisms exist in varying degrees of effectiveness in most countries of the world. However, they tend to be the strongest in the North where many, if not all, of these concerns initially emerged. These mechanisms to implement and promote OHS have led to the establishment of multifarious and often interconnecting institutions within the governments and civil societies of these countries which, in turn, assist in advocating for OHS at national and workplace levels. Although such networks and advocacy groups exist in some Third World countries, it is commonly accepted that "the state of occupational safety and health in developing countries is much poorer than in industrialised countries."⁷ This difference between developing and developed countries has motivated a series of programmes that seek to develop these mechanisms of implementation for OHS in the South.

2.2 Occupational Health and Safety and Development

Although technical cooperation programmes in the field of OHS under the aegis of the UNDP began providing assistance to developing countries by the late 1950s, it was not until the mid-1960s that a specific relationship between OHS and development was strongly made. This relationship was visibly forged into a global issue by the fifth session of the Joint ILO/WHO Committee on Occupational Health which took as its theme "Organisation of Occupational Health Services in Developing Countries." Implicitly assuming that the improvement of OHS standards and services leads to healthy workers, higher economic

⁶ G. Juvet. 1983. "International Occupational Safety and Health Information Centre (CIS)." *Encyclopaedia of Occupational Health and Safety*. 3rd edition. Geneva: ILO.

⁷ ILO. 1985. *World Labour Report 2*. Geneva: ILO. p.143; WHO. 1988. *Training and Education in Occupational Health*. Technical Report Series No. 762. Geneva: WHO. pp.13-14. See also J. Jeyaratnam (ed.). 1992. *Occupational Health in Developing Countries*. Oxford: Oxford University.

productivity, and ultimately elevated standards of living in the Third World,⁸ the Committee proposed increasing medical surveillance of the workplace and of workers' health as its main solution to assist the establishment of OHS in developing countries.⁹ As a consequence, their recommendations for the governments of developing countries centred on the following: increasing the number of OHS medical personnel and government inspectors; establishing OHS centres, Institutes, and laboratories to train and educate professionals, employers, and workers; encouraging large enterprises to set up their own OHS services; and passing the proper legislation and regulations.¹⁰

Significantly absent, in light of what are taken today as the dominant mechanisms for implementing OHS, was "research." Instead, importance was placed on increased foreign assistance to developing countries and on better planning by governments to efficiently use what scarce resources they have in order to facilitate the implementation of the Committee's recommendations.

Another significant feature of this report was the use of a mechanistic notion of development. Common to the modernisation theories of the time, such language promoted the view that OHS would eventually emerge in these countries when proper training was provided and industrialization was achieved.¹¹ Such an assumption not only dismissed the knowledge and

⁸ "The effects of occupational health services locally may be observed in reduced morbidity, less sickness absenteeism, and lower frequency of occupational injuries and diseases.... Occupational health services will increase the health standard of the employee and improve the individual working capacity.... As a consequence of the improved health and working capacity, the income of the worker may be increased due to reduced absenteeism, and the standard of living, and consequently food consumption and nutrition, may be better than before." A. Bruusgaard, S. Forssman, L.J. Goldwater, L. Noro, and M.O. Shoib. 1967. "Occupational Health for Developing Countries." In ILO. *Organisation of Occupational Health Services in Developing Countries*. Geneva: ILO. p. 81.

⁹ For example, pre-employment medical examinations were underscored as a vital OHS practice which in certain industrializing countries "may represent initially the only activity that can be carried out. The Committee was of the opinion that it would be valuable to make such pre-employment medical examinations compulsory." ILO. 1967. "Report of the Fifth Session of the Joint ILO/WHO Committee on Occupational Health." In ILO. *Organisation of Occupational Health Services in Developing Countries*. Geneva: ILO. p.9.

¹⁰ *Ibid.*

¹¹ "It was emphasized that industrialization and the resultant economic development might frequently result in an increase in the income per capita, an improvement in nutrition, and the raising of the cultural level; these are powerful factors in enhancing the standard of health of the population. Initially, however, industrial workers may have to contend with an unfavourable health situation, which they share with the general population, as well as

possible participation of those occupational groups who are said to benefit from such development projects, but it also showed a faith that development will follow the forces of an unidirectional evolution rather than being subjected to the dynamics of politics and history. Improvement of OHS in the Third World thus was largely seen to be a function of proper planning, not a combination of sound research and conducive political and policy support.¹²

During the 1970s, two trends in the North began to have some bearing in the relationship between OHS and development. First, greater worker and union involvement in OHS matters in the North led to growing demands for a greater role of trade unions in the prevention of occupational hazards.¹³ Second, research in occupational health and safety became more of a priority in the North.¹⁴ This trend is signalled by the growing role of occupational epidemiology during this period.¹⁵ This emphasis on OHS research soon began to emerge in the context of development. By the late 1970s, the ILO and WHO emphasized developing specific programmes for OHS services, including the use of epidemiology to monitor workplaces, evaluations of workers' health problems, and the promotion of greater workers'

fatigue and occupational hazards. These last two factors are, however, very important as the workers have neither the experience nor the appropriate knowledge to combat them." *Ibid.* p.8 (emphasis in original).

¹² In the introduction of the Report, the problem of improving OHS in developing countries was identified as one mainly of administration of resources: "it appeared that while reviewing possible resources in this field, it was useful to study the types of difficulty that prevented their proper use and the means by which these difficulties might be overcome." *Ibid.* p. 3. For a critical discussion of the over-emphasis on "planning" in development generally, see A. Escobar. 1992. "Planning." In W. Sachs (ed.) *The Development Dictionary*. London: Zed Books.

¹³ See, for example, comments made in the First African Regional Congress on the Prevention of Occupational Risks. International Social Security Association. 1972. *First African Regional Congress on the Prevention of Occupational Risks*. Algiers, 27 April - 4 May 1971.

¹⁴ "The combination of rising injury rates and the upsurge of social conflict over accidents resulted in a series of studies in the early 1970s.... The funding of research grew.... New journals appeared and many books [on the topic] were written." T. Dwyer. *op. cit.* p. 720.

¹⁵ A commentator observed in 1983, "What has emerged more and more clearly in recent years is the need for a more systematic, rigorous and timely use of the epidemiological approach as a tool to foster health in the workplace." R. Saracci. 1983. "Epidemiology." *Encyclopaedia of Occupational Health and Safety*. 3rd edition. Geneva: ILO. p.768. See also M.A. Batawi. 1983. "World Health Organisation." *op. cit.*

participation in OHS.¹⁶

The problem of OHS in the South was now being seen less as a consequence of delayed modernisation in developing countries and more due to the use of dangerous production processes in many enterprises and the neglect of workers' health by government officials, development planners and employers, in addition to the other development problems identified by commentators in the 1960s (such as the lack of regulatory capacity, low numbers of trained personnel, and the general poor health standards and conditions of the population).¹⁷ This perspective still informs current understandings of the problem. For example, in its 1995 *World Development Report* the World Bank underscores the importance not only of improving OHS in development initiatives but also of the role that unions and other civic organizations should play in the enforcement of health and safety standards.¹⁸ This change in the understanding of the development problem concerning OHS over the last twenty years has led to an increased interest in promoting research to understand the specific occupational risks and problems facing particular occupational groups in Third World nations as well as an emphasis on taking into account the wider, impinging political and economic context of OHS conditions and standards.¹⁹

The ILO and the WHO continue to be the strongest advocates for the improvement of OHS in the South. Although such efforts still promote the importance of the four traditional mechanisms of implementation -- the state, services at workplaces, education/training, and improved dissemination of information -- they also now commonly advocate the value of research on OHS in development. For example, in its recommendations to WHO, the second meeting of WHO Collaborating Centres in Occupational Health included "strengthening of research" as a key objective as part of the proposed "Global Strategy on Occupational Health

¹⁶ See, for instance, M.A. Batawi. 1983. "World Health Organisation." op. cit.

¹⁷ For an example of this new diagnosis of the 1980s, see W.O. Phoon. 1983. "Occupational Health in Developing Countries: A Simple Case of Neglect." *World Health Forum* 4:340-343.

¹⁸ See World Bank. 1995. *World Development Report 1995: Workers in an Integrating World*. New York: Oxford University Press. pp.76-79.

¹⁹ For example, while discussing the need for research of the particular environmental agents to which workers in developing countries are exposed, Noweir observed that "the scientific data are not the sole determinant of occupational exposure standards. Rather, as well identified by the World Health Organization [1977], historical, economic, cultural, and political considerations influence the setting of standards." M. Noweir. 1986. "Occupational health in Developing Countries With Special Reference to Egypt." *American Journal of Industrial Medicine*. 9: 135.

for All.”²⁰ As Rantanen and Jeyaratnam summarized in their contribution to a recent textbook on OHS and development, “[r]esearch is an important tool for the development of occupational health in developing countries, providing a scientific basis for policy-making, priority-setting, problem-solving, professional training, and evaluation.”²¹ This has been the philosophy behind IDRC’s support of OHS research in the South.

²⁰ WHO Collaborating Centres in Occupational Health. 1995. *Global Strategy on Occupational Health for All*. Recommendations of Second Meeting, 11-14 October 1994 in Beijing, China. Geneva: WHO. pp.62-63.

²¹ J. Rantanen and J. Jeyaratnam. 1992. “Research policies and needs.” In J. Jeyaratnam (ed.) *Occupational Health in Developing Countries*. Oxford: Oxford University. p.484.

3. IDRC and Occupational Health and Safety Projects

It is within this context of increasing global interest of the last fifteen years that IDRC has been involved in OHS research in the South. In that period it has funded a wide range of projects on OHS and has been a noticeable presence in the field.²² Before assessing the impact these projects have had, a closer examination of the type of projects funded by IDRC over the years will be presented.

3.1 IDRC's Occupational Health and Safety Projects

IDRC has supported 54 projects in the field of OHS. All of these projects have investigated one or more of the following as one of their research objectives: the causes and/or remediation of health hazards for an occupational group; the knowledge of and/or role played by an occupational group in the assessment or enforcement of health and safety practices; the improvement of information sources of occupational health and safety and/or management of this information. No projects that were terminated before their completion are included for examination here (for a complete list of the projects, see Appendix 2).²³ Projects that have looked at the health effects of production processes on non-occupational groups (e.g. through wastewater or mercury contamination) also fall outside the scope of this study.

In this section I shall provide an institutional sketch of the type of IDRC support to these projects. In particular, I shall examine: the administrative divisions under which these projects fell; the money allocated to these projects; the disbursement of these projects by year, by geographical region, and by occupation; and the institutional composition of these projects.

²² For example, it was mentioned in a WHO publication that some professional organizations have played a role in promoting and developing research. The only example they give is that of the Asian Association of Occupational Health (AAOH). Of the three multinational research projects carried out in the early 1980s under the aegis of the AAOH, two were funded by IDRC (although not acknowledged in the publication). See *Training and Education in Occupational Health*. op.cit. p.35, and IDRC-funded projects "Occupational Health in Small-Scale Industries in S.E. Asia" (82-0221) and "Pesticide Poisoning in S.E. Asia" (83-0089). As Rantanen and Jeyaratnam recently observed, "Development aid agencies such as FINNIDA and IDRC in Canada have recognized the need for strengthening occupational health research in developing countries...." See "Research policies and needs." op.cit. p. 477.

²³ Project 81-0144, "Pneumoconiosis" (India) was cancelled, only to begin again as project 83-0303, "Pneumoconiosis" (India) which was completed. Project 87-0241, "Mining Sector" (Bolivia) was cancelled due to problems between the Principal Investigator and the Recipient Institution in Bolivia.

The first project in OHS funded by IDRC studied industrial health in Thailand.²⁴ It was promoted in the 1979-80 *Annual Report* as a "new field of research for the [Health Sciences] division, one that will likely see increasing activity in [the] future." Although only two new projects were funded next year, 1980-81, they both fell under a new program within the Health Sciences (HS) division called "Occupational Health." From the following year until 1992, IDRC supported a minimum of two and a maximum of seven projects concerning OHS each year. By far the majority of the projects funded in this field between 1979 and 1992 (47 of 54) fell under HS. Until 1987, all but one project within HS fell under the "Occupational Health," or its replacement, "Occupational Health and Environmental Toxicology" program.²⁵ "Occupational Health and Environmental Toxicology" remained as a sub-program under the "Health and the Environment" program until 1990. After that point, almost all of OHS projects in HS division fell under "Health and the Environment" and its replacement "Health, Society, and Environment" program.

In 1995, restructuring at IDRC led to the merging of the four program divisions (HS, Social Sciences, Environment and Natural Resources, and Information Sciences) into a single Programs Branch. During this period of restructuring, occupational health has been identified as no longer a research priority. Funding for further projects, except one for which the Centre had made an earlier commitment,²⁶ was put on hold while the new multidisciplinary focus of the Programs Branch was put in place.

Of the remaining six OHS projects supported by IDRC, three were administered by the Information Sciences division, one project by the (former) Earth and Engineering Sciences division, and two by the Social Sciences division, one of which was jointly administered with HS (but Social Sciences was the responsible division).²⁷

When looking at the number of OHS projects supported between 1979 and 1995 (Figure 1), it is seen that most projects began between 1983-1990, with a virtual stop in funding new OHS projects after 1992 until the single project received funding in 1995.²⁸

There was a total of \$7,836,015 allocated to these 54 projects. In terms of the HS Division,

²⁴ This was 79-0070, "Industrial Health" (Thailand).

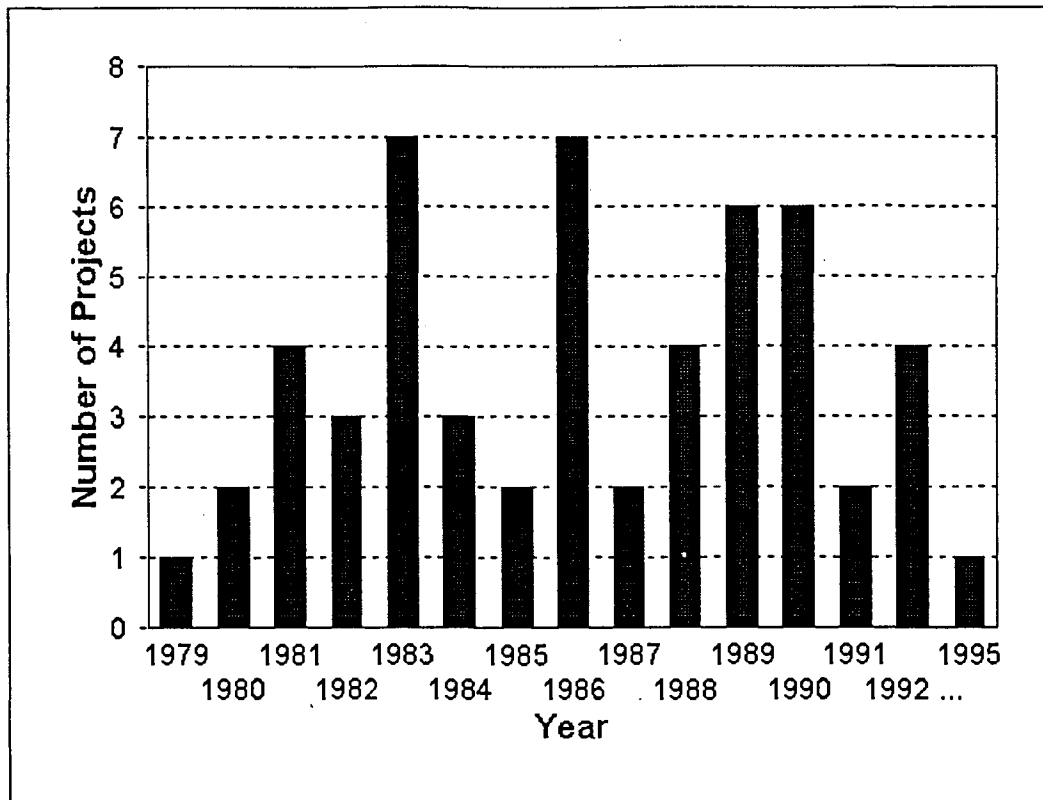
²⁵ The project - 83-0086, "Health of Working Mothers" (Hong Kong) - fell under the "maternal and child health" program.

²⁶ This was 95-1050 (01023), "Projet de formation á la recherche dispensée en français pour la santé au travail en Afrique" (West Africa).

²⁷ This was 88-0186, "Occupational Health and Rural Community Education" (Peru).

²⁸ During the period 1992-1995, there was an internal staffing change relating to the OHS projects which influenced the focus of and support given to OHS at IDRC.

Figure 1 Year Projects Began to Receive Funding



Key

The histogram represents the starting year of the completed IDRC-supported occupational health and safety projects.

OHS projects received on average five per cent of the total funds appropriated for supporting projects. In terms of amount of money and percentage of HS program appropriations when they were approved, OHS projects were supported the most between 1982 and 1984, 1986, 1988-1990, and 1992. The years 1980, 1985, 1987, 1991, and 1993-1994 were the least important years for starting projects (see Table 1).

Table 1 Money Spent on OHS Projects in Total and in HS, Compared to HS Program Appropriations Per Year (1979 - 1995)

Year	Total \$ Spent - OHS projects	Less Non-HS \$	HS Program Appropriations	% of HS \$ spent on OHS
1979	\$66,700	\$66,700	\$3.1 million	.02
1980	\$58,700	\$58,700	\$4.6 million	.01
1981	\$337,580	\$337,580	\$5.9 million	.06
1982	\$432,750	\$432,750	\$5.7 million	.08
1983	\$745,715	\$705,615	\$7.5 million	.09
1984	\$385,220	\$385,220	\$7.5 million	.05
1985	\$279,550	\$79,730	\$10.2 million	.01
1986	\$665,780	\$665,780	\$10.8 million	.06
1987	\$139,530	\$139,530	\$12.8 million	.01
1988	\$1,181,030	\$1,081,030	\$15.1 million	.07
1989	\$923,680	\$535,910	\$10.6 million	.05
1990	\$857,183	\$857,183	\$10.2 million	.08
1991	\$401,460	\$238,750	\$15.3 million	.02
1992	\$561,137	\$561,137	\$12.1 million	.05
1993	\$0	\$0	\$8.2 million	.00
1994	\$0	\$0	\$5.7 million	.00
1995	\$800,000	\$800,000	n/a	n/a
Total	\$7,836,015	\$6,943,614	\$145.3 million	.05

The 54 projects took place in 36 countries (see [Figure 2](#)). Six of the projects were multi-country projects, each involving three to seven countries. [Table 2](#) divides the projects among the IDRC regions by the original 54 projects (placing multi-country projects by the IDRC region under which most of the individual countries involved fall). It shows that eastern Asia had the most OHS projects, followed by East Africa and Latin America (both projects in West Africa were multi-country projects).

Table 2 OHS Projects by IDRC Region

IDRC Region†	Number of Projects
Asia	20
East Africa	13
Latin America	10
Middle East	7
South Asia	2
West Africa	2
Total	54

† The IDRC regional office for South Africa began operating after all the Southern African OHS projects began and thus is not included as a separate region here.

These projects may be analysed by the location and type of occupation studied as well as by the occupational risk assessed ([Table 3](#)). The majority of projects had an urban focus, researching some component of OHS in urban areas. In terms of the occupations studied, a third of the projects studied some form of manufacturing industry (such as textile factories or pesticide manufacturers) and almost a similar number researched agricultural occupations. These focuses exemplify the attention in the literature to the problems concerning the introduction of new manufacturing technologies in the South and to the fact that agricultural workers still represent the largest single occupational group in the world, particularly in the Third World.²⁹ Almost 20 % of the projects carried out “inventory” research,

²⁹ See, for example, C-N. Ong, J. Jeyaratnam, and D. Koh. 1993. “Factors Influencing the Assessment and Control of Occupational Hazards in Developing Countries.” *Environmental Research* 60:112-123; R. Lemen and E. Bingham. 1994. “The Continuum of Prevention During Industrial Development: New Markets and the Introduction of Old and New Technologies.” *Advances in Modern Environmental Toxicology* 23: 661-680; and G. Rainbird and D. O'Neill. 1995. “Occupational disorders affecting agricultural workers in tropical developing countries.” *Applied Ergonomics* 26 (3): 187-193.

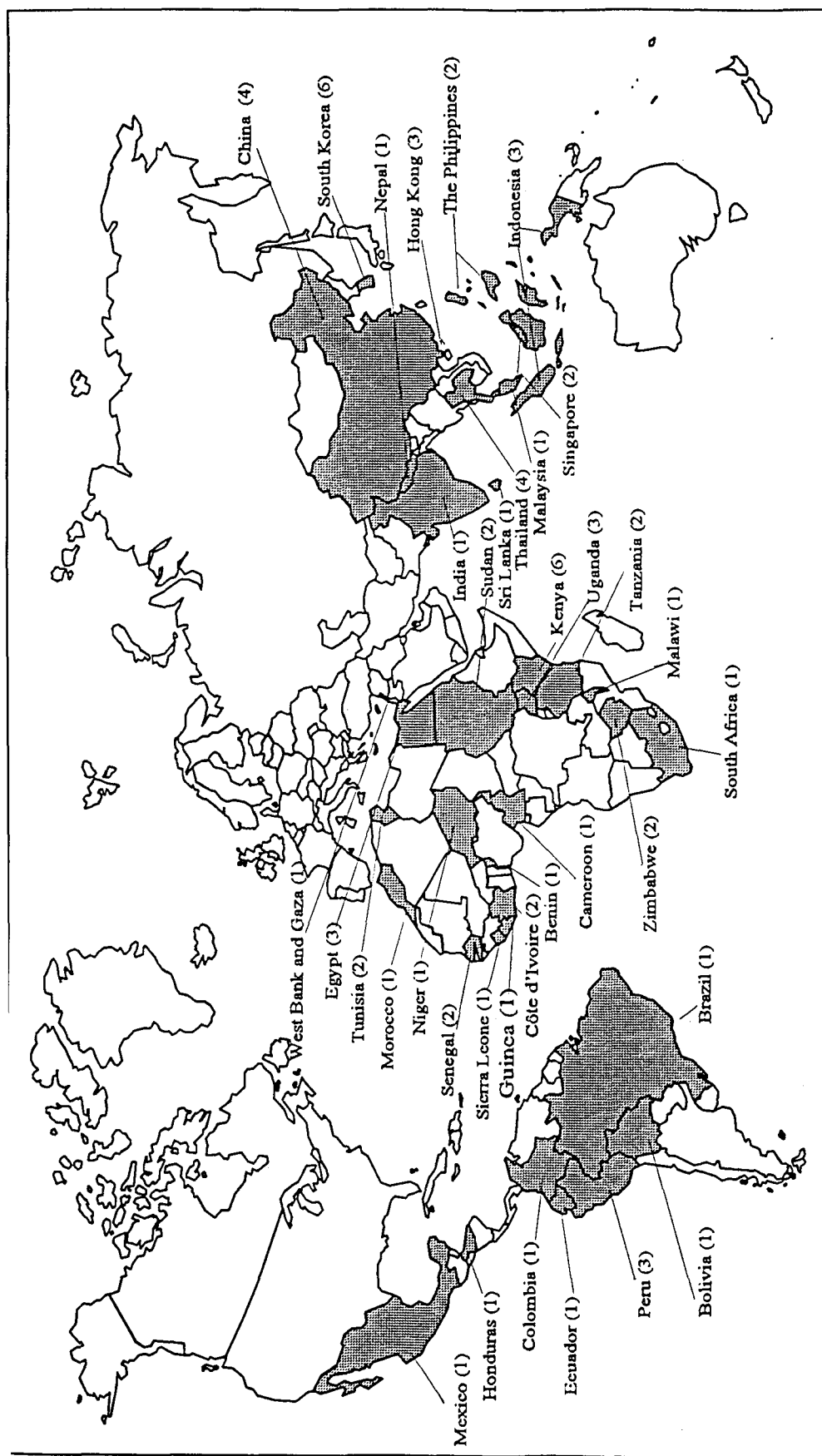


Figure 2 Geographical Distribution of IDRC-supported OHS Projects

KEY

(Number) Number of projects taking place in the country, including multi-country projects

analysing some aspect of OHS across multiple occupations in order to ascertain a broad understanding of some problem (for example, surveying the extent of coverage under occupational health services of workers in different occupations). Just over 10 % of the projects concerned mining occupations and an equal number investigated other occupations. In regards to the type of hazards studied, over 60 % of the projects investigated chemical hazards such as pesticides, mineral dusts, and solvents. Almost 25 % of the projects studied some aspect of improving OHS capacity (such as training health professionals), delivery (such as OHS services to small-scale industries) or availability (such as dissemination of information on occupational risks in particular industries). Over a fifth of the projects studied physical hazards (such as noise, heat, safety guards of machines). The emphasis on chemical hazards is indicative of the extent of the growing use of pesticides, processing of minerals and plants, and the importing of hazardous materials and industries in the Third World as well as the increased toxicological risk to workers in this area given their relative malnutrition, longer working hours, and lack of regulatory and

Table 3 Some Characteristics of OHS Research Projects

Urban/Rural Focus of Projects		Percentage
Urban-based occupational groups		53
Rural-based occupational groups		32
Urban- and rural-based occupational groups		15
Type of Occupations Studied †		Percentage
Manufacturing occupations		33
Agricultural occupations		32
Inventory (multiple occupations)		17
Mining occupations		11
Other occupations		11
Type of Hazards and Problems Studied †		Percentage
Chemical Hazards		61
OHS Capacity, Delivery or Availability		24
Physical Hazards		22
Other		7

† Some projects include more than one category.

medical surveillance.³⁰

In terms of the institutional base of the researchers carrying out the project, Table 4 shows that the majority of the projects (almost two-thirds) took place (completely or partially) under the auspices of a university. A third of the projects were carried out (completely or partially) by government institutions (such as research centres, national institutes of occupational health and safety, and Ministries of Labour or Health). Trade unions, non-governmental organizations, and national occupational health and safety associations were each involved in 6 % of the research projects. In other words, almost a fifth of the projects took place (completely or partially) under the auspices of a non-university civil society organization.

Table 4 Distribution of Projects by Recipient Institution

Recipient Institution of Research †	Percentage
University	63
Government	33
Trade Union	6
Non-governmental organization	6
National OHS Association	6

† Some projects include more than one category.

3.2 IDRC in the Donor Context

As mentioned, IDRC has been a significant supporter of OHS research in the Third World. In addition to the anecdotal evidence of IDRC's position referenced above (in footnote 22), the important role IDRC has played in this field is indicated in a recent inventory survey of

³⁰ For a discussion of the growing use of pesticides and the attendant expansion of risks in the Third World, see J. Jeyaratnam. 1992. "Acute pesticide poisoning and developing countries." In J. Jeyaratnam (ed.) op. cit. pp. 255-264; G. Forget, T. Goodman, A. De Villiers (eds). *Impact of pesticide use on health in developing countries*. Ottawa: IDRC; B. Dinham. *The Pesticide Hazard: A Global Health and Environmental Audit*. London: Zed Books. For a discussion of occupational risks associated with mineral and vegetable dusts in the Third World, see M.P.M. van Sprundel. 1990. "Pneumoconioses: The Situation in Developing Countries." *Experimental Lung Research* 16:5-13; T.P. Ng. 1992. "Occupational lung diseases -- mineral dusts." In J. Jeyaratnam (ed.) op. cit. pp. 287-303; C.G. Uragoda. 1992. "Occupational lung diseases -- vegetable dusts." In J. Jeyaratnam (ed.) op. cit. pp. 304-313. For a general discussion of toxic exposures as a key occupational risk in one Third World region, see D. Michaels, C. Barrera, and M.G. Gacharná. 1985. "Economic Development and Occupational Health in Latin America: New Directions for Public Health in Less Developed Countries." *American Journal of Public Health* 75 (5): 536-542.

research in occupational health and environmental epidemiology in developing countries.

A survey of almost a thousand people involved in OHS and development in 1990 showed that only 65 of the 500 on-going projects, or 13 %, in this field received funding from international donors. The most frequently mentioned donors in this survey included the WHO and its affiliated bodies (15 studies), IDRC (12 studies), the Swedish Agency for Research Cooperation with Developing Countries (SAREC, 10 studies), and U.S. government agencies (10 studies).³¹

By analysing this survey in more detail, one finds that IDRC played a significant role in terms of donor support within the regions where it helped to fund OHS research (Table 5). Including only the countries where IDRC had supported ongoing research projects in OHS that were included in this survey (and excluding the environmental epidemiology projects), the data shows that IDRC supported one third of the donor-supported projects, or anywhere from just under 10 % to over 85 % of the research projects in the various IDRC regions. In particular, IDRC played a big role in supporting OHS research in the Middle East as well as East and Southern Africa.

Table 5 Number of Ongoing Occupational Health Projects Funded by Donors and by IDRC†

IDRC Region	Total Projects‡	Total Donor-Funded Projects	Total IDRC-Funded Projects	IDRC Projects as % of Donor-Funded Projects
ASRO	158	11	1	9.09 %
LACRO	48	10	2	20.00 %
SARO	34	4	1	25.00 %
MERO	18	3	2	66.67 %
EARO	19	7	6	85.71 %
Total	306	36	12	33.33 %

Source: WHO and IDRC. 1991. *Inventory of Ongoing Research in Occupational Health and Environmental Epidemiology in Developing Countries*. Geneva: World Health Organization.

† Only countries where IDRC-supported projects occurred have been included.

‡ These figures include all occupational health projects (not environmental epidemiology projects) funded by international donor agencies, including IDRC. It does not include funding from universities or from governments.

³¹ B. Levy, T. Kjellstrom, G. Forget, M.R.D. Jones, L. Pollier. 1992. "Ongoing Research in Occupational Health and Environmental Epidemiology in Developing Countries." *Archives of Environmental Health* 47(3):231-235.

Another indicator of the important role IDRC has played in this field is the fact that many of the internationally known Third World scientists working in OHS have carried out projects supported by IDRC. These scientists include W.O. Phoon, J. Jeyaratnam, B. Reverente, M. Noweir, R. Loewenson, J. Myers, and C. Laurell. Although many of these scientists had already established their credentials before receiving IDRC funding, the fact that they have been involved in projects supported by IDRC signals that the Centre has been a significant presence in the emergence of OHS research in the Third World.

In summary, IDRC has been an important donor in the international field of OHS and development. It began supporting projects in this field during the early stages of when there began a growing international interest in supporting OHS research in the Third World. The important question to explore now is what impacts have the IDRC-supported projects in OHS had in national development process in some of the countries where they took place? Moreover, given IDRC's stature in this field, the answering of this sheds light on the larger question, what is the development worth of OHS research?

5. Results and Discussion³⁴

To understand whether the projects had any development effects and how these related to the ideal mechanisms to implement and promote OHS within a country, I analyse the responses to the questionnaire and the data from the case studies in terms of the six categories which structured this research. In this examination, I discuss the results in such a way to try to answer the following: what type of consequences, if any, have IDRC-supported OHS projects had on the development of the recipients, beneficiaries, and the larger policy and institutional framework of the various Third World countries in which they took place? Through answering this, I return in the conclusion to discuss what lessons may be learned for future project development at IDRC.

5.1 Capacity-Building for Individuals and Institutions

An important objective of international donor support of occupational health and safety projects in the South is to build up the research capacity and professional development of researchers in these countries.³⁵ Through strengthening scientific expertise and professional ties between the various parties involved in occupational health and safety issues (such as the government, employers, employees, university researchers, etc.), it is assumed that knowledge about occupational health and safety problems as well as incentives to deal with them will increase in developing countries.

For indicators of the impact of the project on the researcher, information was collected concerning whether the researcher developed ties through the research with different groups or individuals relevant to occupational health and safety issues and/or research. I also asked whether the researcher changed jobs and/or received further funding to carry out research, and the role, if any, that the respondent thought the project had on these career advancements.

As shown in Table 7, the majority of respondents indicated that the projects facilitated the establishment of linkages between the principal investigator and institutional groups (such as the national government, unions, employers' associations, or community groups) and categories of individuals (national researchers, third world researchers, industrialized world researchers) who were involved in occupational health and safety issues and/or research.

³⁴ This section is based on an article co-authored by myself and Gilles Forget submitted to the *International Journal of Occupational and Environmental Health* in September 1996.

³⁵ Recommendations of the second meeting of the WHO collaborating centres in occupational health. 1995. *Global Strategy on Occupational Health for All*. Geneva: WHO. pp. 62-63.

The most significant ties were with other national researchers (93 %) and with the national government (90 %).

Table 7 Linkages developed by research team through project activities

Stakeholder Groups	Linkages Developed in:
National Researchers	93 % of the projects
Government	90 % of the projects
Other Developing Country Researchers	63 % of the projects
Trade Unions	60 % of the projects
Employer Groups	60 % of the projects
First World Researchers	60 % of the projects
Community Groups	53 % of the projects

However, not all the researchers remained within the same institutional setting. The questionnaire showed that 63 % of the respondents had changed jobs since the project began. Two-thirds of the respondents who changed jobs advanced within the same institutional setting (university, government, trade union). The other third of these respondents left the institution in which they were located when they received the funding. Seventy-five per cent of these (six individuals) had left either a university or a government job to enter private business as occupational health consultants or were working for health-care corporations. Of those who changed jobs, 34 % indicated that the donor-supported project had influenced their job change, including half of those who had moved from their original institutions.

These data suggest that the donor-supported projects may have facilitated to a degree the move of researchers from public institutions (e.g. universities and governments) to the private sector within the field of occupational health and safety. Although this may be an improvement for the individual scientists, it may also be a developmental loss for the country as it removes trained individuals from the public sphere. Offsetting this potential loss, however, is the fact that the majority of the respondents (87 %) are still based in the countries where they carried out their research, even though some of the projects were completed more than fourteen years ago. Only 13 % of the respondents had taken up permanent work outside of the country where they carried out the research, and only 3 % of these relocated to an industrialised country. These results show that international support for research by local scientists in developing countries may help to stem the "brain-drain" problem whereby trained professionals migrate from the South to the North.

The case studies helped to clarify how the research projects supported the strengthening of the scientific expertise and careers of the researchers. All principal investigators who were interviewed commented on how the international financing permitted a greater and more sophisticated research scope than allowed by locally-funded projects. This research experience permitted them and other members of the research teams to considerably augment their research and scientific expertise in a variety of ways.

All the projects in the case study entailed the strengthening of ties between the researchers and groups and individuals involved in occupational health and safety such as government departments, national and international researchers, international development agencies, employers' associations, trade unions, non-governmental organizations, and the occupational group studied. For three of the projects, most of the ties were not sustained after the research ended. In the case of the Bolivian project, the researchers did not have funds to continue research in regards to pesticides. Although the researchers said that the project strengthened their ties to officials in other government agencies and ministries, they did not maintain any contact with officials or members of the farming communities where they carried out the research. A similar progression of events occurred in the Colombian project. The researchers have maintained their ties to other government officials in the capital, but did not have any contact with the farmers and officials of the study area after the completion of the research. In the case of one of the Peruvian high altitude study, the scientific interest of the researchers did not remain within occupational health and safety and they did not maintain ties with officials, workers, or union members involved in this field. For two other projects, the ties made during the research have been maintained. The scientific findings of the Mexican project were noteworthy enough to assist them in increasing ties to national and international trade unions as well as with non-governmental organizations who work with workers in Mexico. The scientific findings achieved by the researchers in the Peru pesticide project also were influential in giving them credentials to build ties with the national government, university-based researchers and occupational health and safety programmes, the company involved with the occupational risk studied, and the occupational group studied itself.

Furthermore, junior researchers involved in the projects seemed to have benefitted greatly from the internationally-supported research. Three junior members of the research team for the Mexico project said that the project gave them experience and skills in carrying out a sophisticated research protocol enriching their scientific credentials which facilitated their obtention of faculty positions. Furthermore, these three junior members and another from the same project as well as junior members from the research teams for the Colombian project and the Peruvian pesticide project said that the project experience was influential in allowing them to find positions as consultants in other occupational health and safety projects taking place in their countries. The facilitation of ties may have also assisted in stemming the brain drain of the researchers in the case study projects. Thirty of the thirty-two members of the research teams in the five case study projects were still based in the countries where they carried out their projects.

In addition to assisting the development of researchers, part of the capacity-building objectives of donor support for occupational health and safety projects in the South concern supporting research institutions. As a way to examine how the projects affected the research capacity of the recipient institutions, the questionnaire asked about short-term and long-term changes pertaining both to internal activities of the recipient institution (e.g. the updating of equipment, the training of staff, obtaining funding for further research) as well as the building of external relations with other groups involved in occupational health and safety

issues and research (e.g. the national government, community groups, unions and employers' associations). The definitions of "short-term" and "long-term" were left open-ended, allowing the respondent to interpret them as he or she decided.

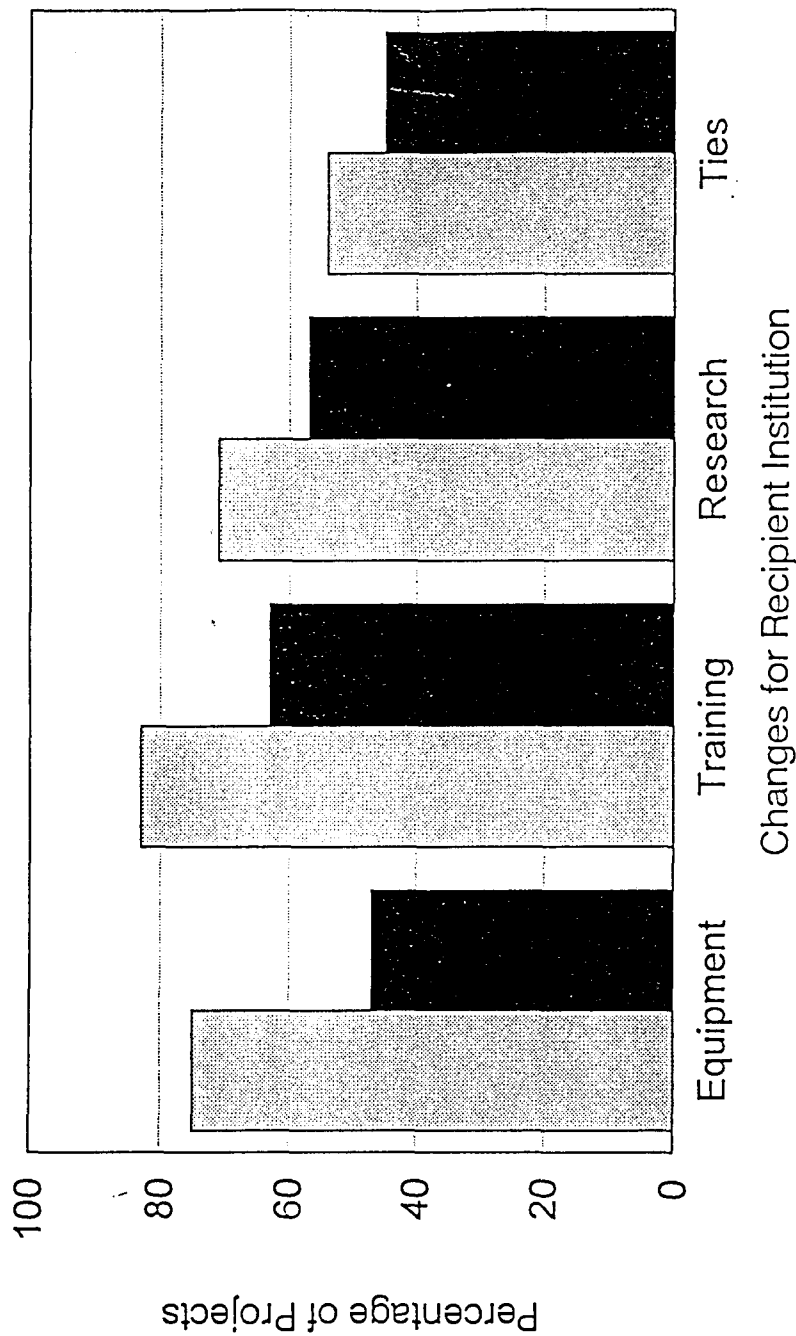
Although the questionnaire gave the option for respondents to indicate negative changes resulting from the project, none were noted. Instead all the changes reported were positive. For the sample as a whole (Figure 4), the most significant impact of the projects in the short term were the training of the staff (83 % of the projects), updating the equipment of the institution (75 % of the projects), and favouring the development of other research projects (71 % of the projects). In terms of building relations between the research institute and other groups involved in occupational health and safety issues and research, one in two projects facilitated the development of such relations in the short-term. While all of these changes were still significant in the long-term, the respondents noted that their impact on the recipient institutions was reduced over time.

However, there was a significant difference between the durability of these changes on government institutions compared to universities. The impact of the projects in both the short-term and long-term for government recipient institutions was considered more significant than for university recipient institutions in all categories by respondents (Figure 5). This difference between recipient institutions in terms of impact may be explained by the fact that universities tend to receive more international grants than government institutions and therefore the impact of individual donor-supported research projects on government recipient institutions is greater. If the aim of the donors is to strengthen the capacity of the recipient institution in the field of occupational health and safety, then it appears that they may have a greater sustained impact on research projects carried out by government institutions.

In the case study, the impact of the project strongly depended on the type of existing support for occupational health and safety issues within the recipient institution and beyond. In four cases, heads of the recipient institutions visited affirmed that the project updated the equipment and improved staff training in the short-term. However, the long-term effects were not as pronounced. The equipment of some institutions, especially those that were government-based, had not been significantly updated since the completion of the research project four to eight years previously. Moreover, in all of the four Latin American countries of the case study, representatives of government departments concerned with occupational health and safety issues discussed the limited support from the national budget and from international organizations for research in this area.

In terms of capacity-building, the impact of the donor-supported projects also depended on the pre-existing focus of the institution and its capacity to get further funding. The two university departments (Mexico and one of the Peru projects) maintained research programmes after the end of the projects under scrutiny. IDRC assisted the recipient institutions for the Mexican and the Peruvian high altitude projects by providing some equipment. However, as noted in the questionnaire responses, the significance of the impact

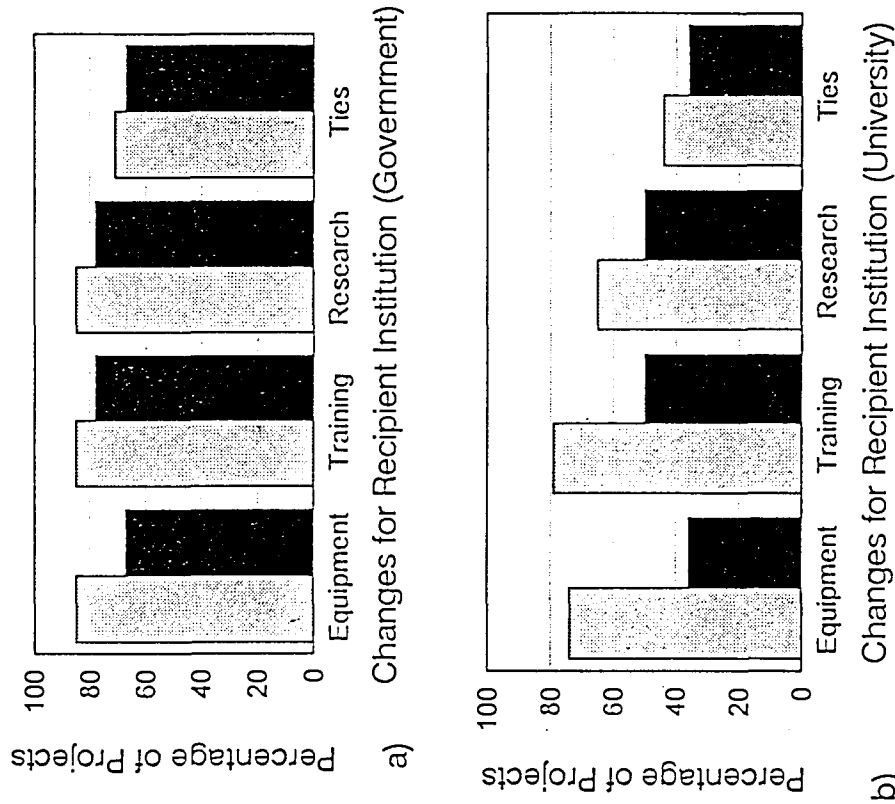
Figure 4 Project impact on recipient institutions: globally



KEY

The histogram indicates the percentage of projects reporting short-term and long-term impacts on the recipient institutions. The impact is expressed as update in equipment, training of staff, strengthening of research capacity, and forging of ties between research institution and groups and individuals involved in occupational health and safety issues and/or research. ■ short-term changes; ■ long-term changes. From the questionnaire data, we interpret “short-term” as changes to the institution during the project and “long-term” as changes to the institution after the completion of the project.

Figure 5 Project impact on recipient institutions: government institutions and universities



KEY

The histogram indicates the percentage of projects based in government institutions (a) and universities (b) resulting in short-term and long-term impacts on recipient institutions. The impact is expressed as update in equipment, training of staff, strengthening of research capacity, and the forging of ties between research institution and groups and individuals involved in occupational health and safety issues and/or research. ■ short-term changes; ■ long-term changes. From the questionnaire data, we interpret “short-term” as changes to the institution during the project and “long-term” as changes to the institution after the project was completed.

appeared to be rather small as these institutions had other channels for receiving research support.

For the Peruvian pesticide project, the project helped to facilitate the increase of ties between the non-government organisation (which was the recipient institution) and national universities, government departments and other groups involved in occupational health and safety. This was the first major research project carried out under its auspices and its success in carrying the research out gave it greater credibility amongst other institutions and the occupational group studied. According to the members of the NGO, they have been contacted several times by government officials and universities concerning pesticides. The country representative of Pan-American Health Organisation (PAHO, a WHO regional body) confirmed that this NGO had a good reputation because of this project. The non-governmental organization continued carrying out projects after the completion of the research. Although it had not carried out as broad a research project as the one under review, during the case study it was in the process of seeking funding to do another one.

The impact of the donor-funding differed for the two projects carried out by government-based researchers. The project carried out by the government institute in Bolivia was the only internationally-financed project it had received. The government institute was not explicitly a research centre and depended almost entirely on the national budget for its activities. As such, it had not received any other donor support for research after the completion of this project under review four years ago. The project carried out by the government research centre in Colombia had a different impact. This was one of many internationally-supported projects for the centre. However, the project under review was one of the earliest internationally-supported projects it had received and representatives of the centre noted that project had led to the obtention of further international support for its research projects, thanks to the ties acquired with other donors during project activities.

Within this context, the relatively positive impacts produced by receiving internationally-supported projects have been attenuated as some recipient institutions, particularly the government institute, have not been able to continue as strong of a research programme as its members would like.

Overall, the case study confirms the trends found in the questionnaire survey. Namely, internationally-supported projects in occupational health and safety have had a significant impact on the individual scientists and on recipient institutions. The projects have assisted researchers in strengthening ties to institutions and individuals involved in occupational health and safety issues in their country as well as internationally. Additionally, the study suggests that the projects may have encouraged local researchers to remain within their country contributing to national efforts for development. The IDRC-supported projects have generally helped to strengthen the research capacity of recipient institutions by supporting training, providing equipment, and assisting the recipients in securing grants allowing them to carry out further research and to build ties with other groups involved in occupational health and safety. In summary, the analysis demonstrates that the research support has had

an impact in the longer term in strengthening local research capacity for occupational health and safety.

5.2 Research Output

Another marker to decide the effects of the research on capacity-building is to examine whether or not the project facilitated recipient scientists to further their involvement in the international and national scientific community. For indicators of the impact of the project on research capacity, I solicited answers concerning the number of scientific publications resulting from the project and the subsequent research careers of the recipient scientists.

The answers to the questionnaire showed that 76 scientific articles and books were published out of the research between 1982 and 1996 in the 38 projects, or an average of 2 publications per project.³⁶ There is a significant range of publications per project (Figure 6). Twelve projects did not result in any scientific publications, while four projects led to the publication of six or more peer reviewed papers (see Appendix 6 for a list of publications from the surveyed projects, including those resulting from the projects of the case study which are discussed further in this section).

Projects differed in their publishing rate according to the type of their recipient institutions and by the geographical region in which they were located. In terms of research institutions (Figure 7), projects carried out by universities led to more scientific publications than those carried out by government institutions by a margin of two to one. Two of the three research projects carried out by other research institutions (trade unions or non-governmental organizations³⁷) resulted in publications. In regards to the region in which the recipient was located (Figure 8), there is a similar distribution of publishing rate for those projects carried out in Asia, Latin America,³⁸ and the Middle East/North Africa: 70 to 80 % of the projects resulted in scientific publications. For the projects based in Sub-Saharan Africa, only 45 % led to scientific publications.

The data shows that projects carried out by government institutions and by researchers based in Sub-Saharan Africa were less likely to result in publications. In the sample, there was a

³⁶ Publications which were not peer-reviewed or were not from scientific conferences are excluded from this figure.

³⁷ Private organizations of a charitable or educational nature concerning themselves with problems of development on a worldwide, regional or local scale.

³⁸ Although the principal investigators of the five projects visited in this region for the case study were not given questionnaires, the scientific publications resulting from their projects are combined with the two respondents to the questionnaires based in Latin America to give a more realistic representation from this region.

significant overlap between these two categories. Six of the twelve projects carried out by government institutions were based in Sub-Saharan Africa and, relatedly, six of the eleven projects carried out in this region were done by researchers based in governmental agencies. However, it is not clear whether one variable had more weight than the other in terms of publishing rate. One factor which may have led to reduced publishing rates is that three of the projects carried out by government institutions (two of which were in Sub-Saharan Africa) only studied occupational health and safety information systems. None of these resulted in any scientific publications, but all three projects resulted in the publication of newsletters or safety guidelines. Other factors contributing to a lower publishing rate could include the reduced incentive for researchers based in governments to publish results compared to those based in universities and what some³⁹ find to be a generally poor representation of articles authored or co-authored by Sub-Saharan African scientists in international medical journals across all health disciplines.

Of the 76 scientific publications arising from the projects surveyed in the questionnaire, 33 were in international scientific journals or were textbooks, 29 in national journals, and 14 were in edited volumes. In any event, in every region except for the Middle East/North Africa, the projects resulted in more articles published in international journals than national ones. In terms of the recipient institution, projects carried out by universities and by trade unions and non-governmental organizations resulted in slightly more articles published in international rather than national journals, while those carried out by government institutions led to slightly more articles published in national journals. Perhaps the Middle East/North Africa is the exception since two projects in the region carried out by the same researcher have resulted in thirteen publications in peer-reviewed national journals.⁴⁰

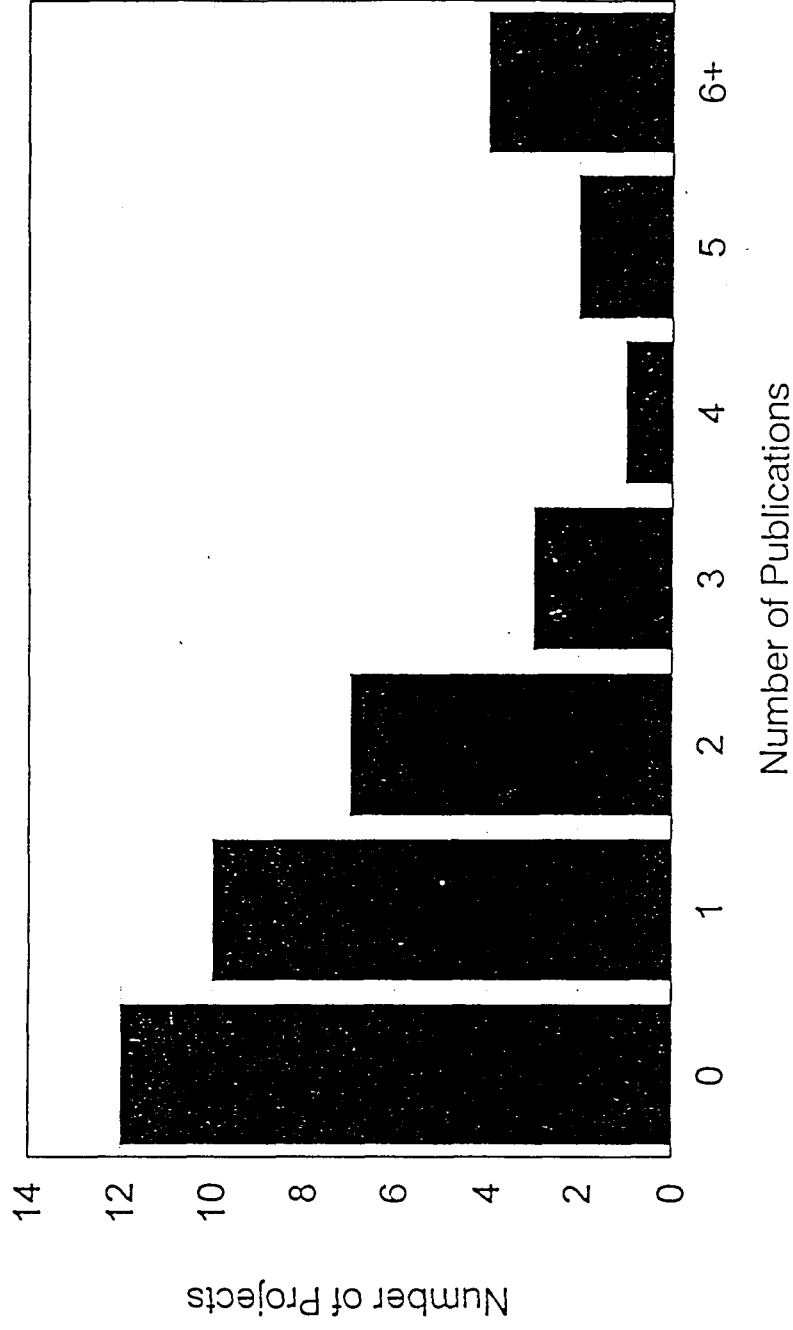
In terms of supporting further research, 72 % of the respondents said that they had received other grants to carry out research and 54 % were currently actively competing for research funds. Of these, 59 % indicated that the project had positively influenced the obtention of further research grants. For those who received new grants, almost 80 % were based in universities. This confirms that university-based researchers, as do their colleagues in the North, may have a greater capacity to publish peer-reviewed papers and also have a greater likelihood of competing successfully for further grants to carry out research.

In four projects of the five case studies, the principal investigators or members of the research team had been involved in subsequent occupational health and safety research projects, while the co-principal investigators in the Peruvian high altitude project were involved in other types of health research. The principal investigators of the Mexican project

³⁹ D. Yach and P. Kenya. 1992. "Assessment of epidemiological and HIV AIDS publications in Africa." *International Journal of Epidemiology* 21:557-560.

⁴⁰ These were 86-0082, "Pesticide Intoxication" (Egypt) and 90-0032, "Pesticide Intoxication, Phase II" (Egypt), which had M.M. Amr as the principal investigator.

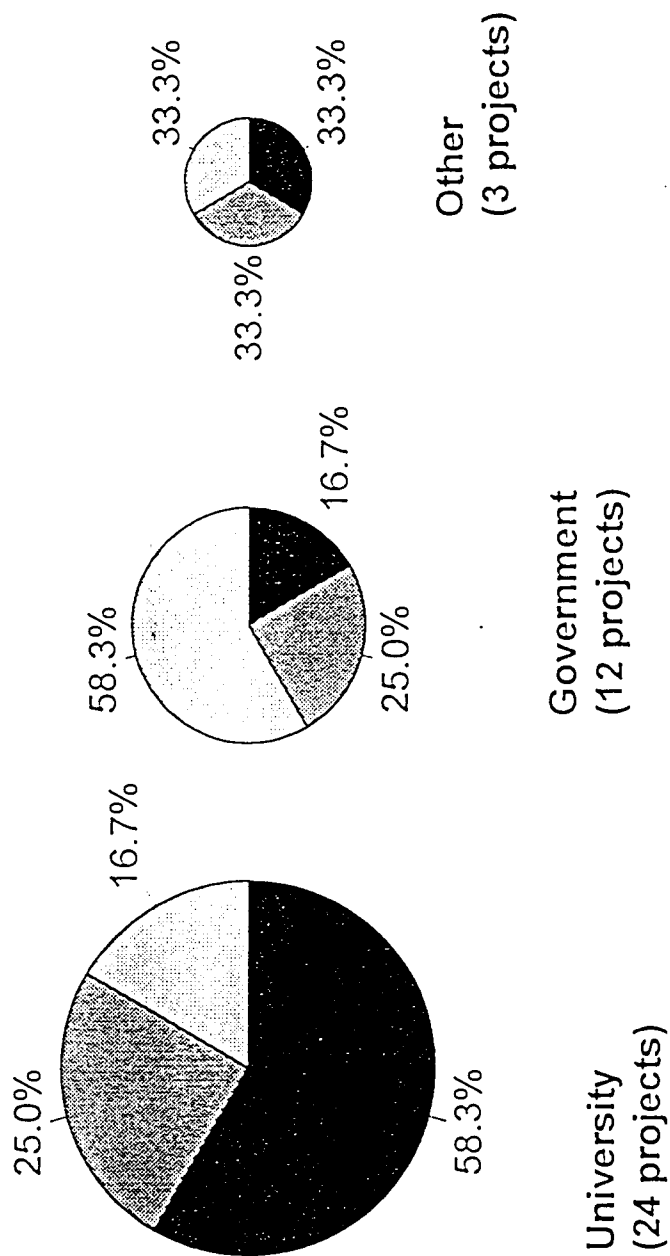
Figure 6 Number of scientific publications per project



KEY

The histogram illustrates the number of publications arising from the surveyed projects.

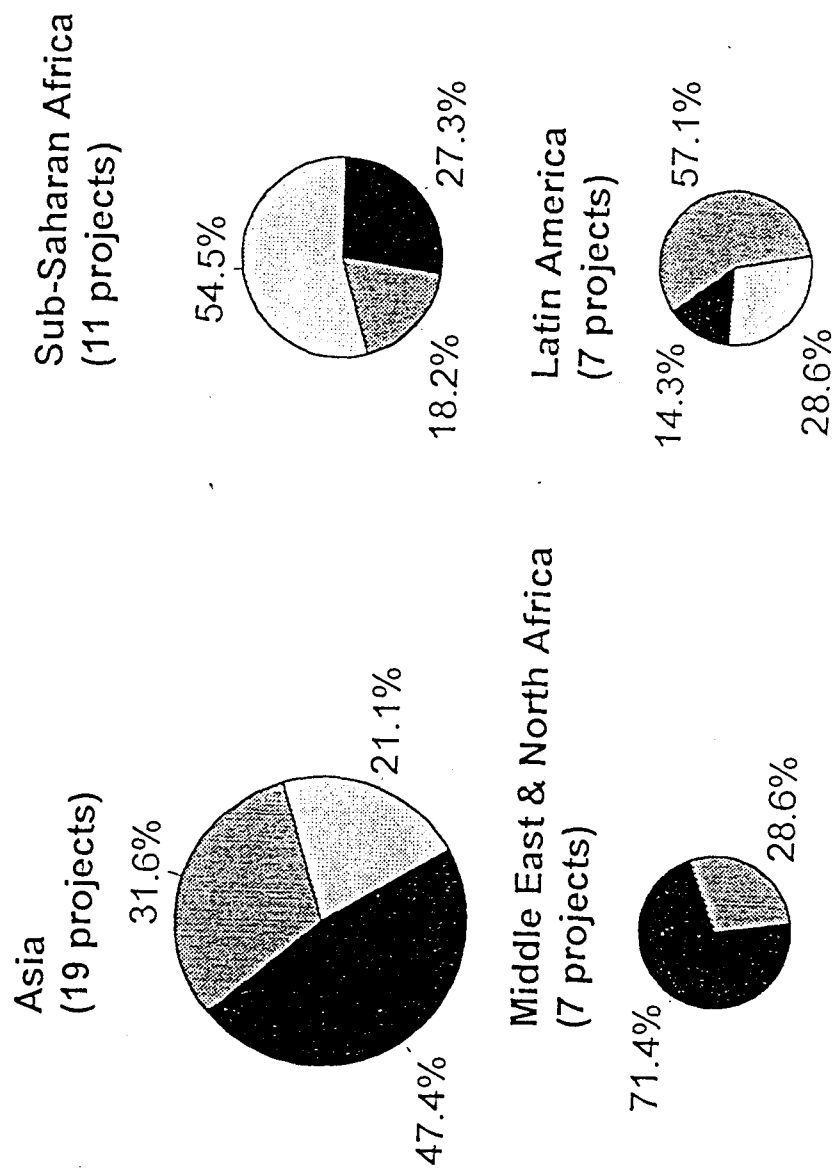
Figure 7 Publications by recipient institutions



KEY

The three proportional pie diagrams indicate the percentage of projects resulting in zero, one, or two or more scientific publications by recipients based in universities, government institutions, or other institutions (trade unions or non-governmental organizations). ■ 2 or more publications; ▨ 1 publication; □ 0 publications.

Figure 8 Publications by region



KEY

The four proportional pie diagrams indicate the percentage of projects resulting in zero, one, or two or more scientific publications by researchers based in Asia, the Middle East, Sub-Saharan Africa, and Latin America (which includes publications from the case study projects). ■ zero publications; ▨ 1 publication; ▩ 2 or more publications.

had the most active research careers in occupational health and safety after the project was completed. Although both were already established scientists in the field,⁴¹ they both said that the research supported by IDRC helped to expand their research credentials and contacts with other scientists doing similar research in Latin America and other regions. The principal investigator of the Colombian project also participated in a number of research projects afterwards, though they were carried out under the auspices of different institutions since she had left the government research institution after the project ended. For the Peruvian pesticide project, many of the researchers of the NGO which carried out the project continue to do research in the same community, along with new researchers who have joined the organization after the project was completed. Others left that institution and have carried out projects with a local university or other internationally-supported NGOs. The least research was carried out by the principal investigator of the Bolivian project. He blamed a reduction in government interest in occupational health and safety and a corresponding decrease in the budget for the government OHS institute where he worked for the limited research carried out after the project.

In summary, the data shows that the projects had an impact on research. The support not only funded research but also facilitated further research, particularly in projects carried out under the auspices of universities.

5.3 Policy and Practice Output

The main objective of most of the internationally-supported research under review was to have a positive impact on the national development process in regards to occupational health and safety. I subdivided this potential impact into three categories which comprised the most important development aims of the research: legislation and regulations; occupational health delivery; and health and safety practices of the occupation(s) studied.

The surveyed projects had significant development impacts at the local and national levels. A quarter of them resulted in legislative change, a third led to changes in regulations, almost a half facilitated better delivery of occupational health services, and nearly two-thirds of the surveyed projects improved the health and safety practices in the occupation studied.

In this section, I examine whether the projects which had specifically posited an objective of effecting change at the local or national level in their research design succeeded or not. I also look at the projects which did not have this specific objective but nonetheless resulted in

⁴¹ One had co-authored a text-book on the situation of occupational health and safety in Mexico in the early 1980s which was called by one commentator on Mexicans working conditions the "standard work on occupational medicine" for Mexico as well as throughout Latin America. See Dan La Botz. 1992. *Mask of Democracy: Labor Suppression in Mexico Today*. Montréal: Black Rose Books. p.21.

such an impact. Projects which were still active at the time of the study were excluded from this analysis.

The questionnaire results show that projects were generally successful in attaining the objective of effecting change at the local or national levels. However, those projects that specifically sought to effect change at the national level (e.g. revise legislation) were not as successful as those projects that explicitly sought to effect change at the local level (e.g. improve occupational health and safety practices). Out of the 16 projects seeking to update legislation, 4 were successful (25 %), while the success rate for those seeking changes in regulations was 9 out of 14 projects (64 %). Out of the 18 projects seeking to improve occupational health services delivery, 13 were successful (72 %). The success rate for those seeking to modify occupational health and safety practices was 18 out of 23 projects (78 %).

When I include those projects that did not state a specific objective to effect change but nevertheless led to that result, a significant percentage of projects resulted in various development impacts at the local and national levels. According to the responses received, a considerable range of changes in occupational health and safety policies and practices did result from the research as recorded below:

- Twenty-four per cent of the total research projects contributed to changes in legislation. Some of these changes included: the legal recognition of particular illnesses as occupational diseases (11 % of the changes); the revision or introduction of laws concerning occupational health and safety (33 %); and the banning of the use and importation of different chemical products (33 %). Two respondents did not specify the legislative changes.
- Thirty-three per cent of the total projects contributed to changes in regulations. Some of these changes included: the introduction of new guidelines for occupational health and safety in collective bargaining agreements (8 % of the changes), the implementation of mandatory employee safety training in the industry studied (8 %), the creation of new rules concerning occupational environment (33 %), and new guidelines regarding the use and sale of pesticides (42 %). One respondent did not specify the changes in regulations.
- Forty-nine per cent of all the projects led to an improvement in occupational health services delivery. Examples of the changes include: the employment of physicians and staff trained in occupational health and safety in either the occupation studied or the servicing health centre (22 % of the changes); better occupational health training of district health and/or agricultural officials (33 %); and the implementation of, or changes in, regulations of a health surveillance system of industries (33 %). Two respondents did not specify the changes.
- Sixty-five per cent of the projects resulted in a change in the occupational health and safety practices in the area of study. Of the projects which had an impact in this

area, examples of some of the changes facilitated by the research include: greater use of protective equipment by the occupational group studied (13 % of the changes); engineering changes to reduce hazards in the occupational sites researched (20 %); and a greater knowledge about risks amongst the occupational group (67 %).

According to responses received, research teams that were based in universities were more likely to carry out a project which resulted in a development impact. Indeed, 23 of the 37 projects that comprised the sample for this section were carried out by university-based teams. Government-based projects were relatively successful in having an impact in certain areas. Five of the twelve government-led projects led to changes in occupational health and safety regulations and better occupational health services delivery, while 7 of these projects facilitated changes in occupational health and safety practices. While the sample was small for the other category (2 projects, one carried out by a trade union and one by a non-governmental organization), it remains that 100 % of these projects resulted in changes in regulations and occupational health and safety practices.

The case study projects revealed some significant impacts themselves. Furthermore, they helped to shed light on some of the important factors leading to such development impacts. In particular, they showed that those research projects that ensured the sustained involvement of interested parties, or "stakeholders," had a greater likelihood of effecting changes. Analysis, however, demonstrates that external factors also were significant factors in translating research into development impact (either positively or negatively).

The Peruvian high altitude project was a baseline survey. It did not propose a research objective to change the existing situation. Its research was principally a fundamental study. It did not build any sustained linkages with any interested party in the research and no development impact had occurred at the time of the case study.

The Mexican project had the explicit research objective of increasing the involvement of the occupational group and its trade union in occupational health and safety issues at the workplace and, ultimately, in a permanent surveillance program of occupational hazards and risks. While this objective was satisfactorily obtained, external factors prevented the actual implementation of the results. This failed to materialise since most of the workers involved in this particular research project were let go by the company following labour unrest near the end of the research. Although the letting go of the workers was not directly related to the research itself, the project ended up not having the support of the management of the steel industry (after it was initially given) and helped to fuel what was reported to be already a very antagonistic labour relations situation.⁴²

⁴² From what different members of the research team informed me and from the project file, the antagonism was not only between management and labour, but also between the union local, which was one of the (few) "democratic" labour organizations in Mexico, and the national union body, which was one of the undemocratic "dinosaurs" in the labour

The Colombian paraquat project was the only case study project with an explicit objective of changing legislation or regulations. Its research was directly motivated by Ministerial interest in the topic. Its research findings, which showed a correlation between paraquat use and chronic obstructive pulmonary diseases, contributed to legislative change whereby paraquat was reclassified from Class II to Class I, a higher level of toxicity (with a concomitant stringency of use in accordance with national guidelines). It also led indirectly to the establishment of a government program aimed at educating medical officials and the farmers in the research area group about the occupational risk studied after the project was completed. Its scientific results helped to reinforce a commitment of officials in a different governmental department to provide occupational health education about this risk.

The Bolivian project, as in the case of the Peruvian high altitude project, was a baseline survey with no explicit objective of changing the existing situation. However, its results indirectly led to a review of existing legislation given its linkages within the government. It facilitated the creation of a government committee to review legislation and regulations on pesticides. The head of this committee indicated in an interview that because the research project on this topic was carried out by a government institute, with close connections to government ministries, its results contributed to the creation of this group. Although not an aim of the project, the research still resulted in a development impact at the national level.

The Peruvian pesticide project sought changes in the delivery of health services and in the health and safety practices of the agricultural workers studied. It exceeded these objectives. This research project carried out by a non-governmental organization had a significant pedagogical component which facilitated a change in local health practices. Due to the activities of the researchers, community health promoters now examine community members in their medical surveillance program for the occupational illness studied and there also was a change in the medical treatment of this illness. During his interview, the former director of the local health centre indicated that before this project the area's doctors had misdiagnosed the cause of this occupational illness, with occasional fatal effects to the workers. During the three years of the research, there were no recorded fatalities due to this occupational illness. Even now, four years after its completion, there has not been any recorded instance of this fatality in the area. The former director and members of the occupational group who were interviewed attributed the lower mortality and morbidity rates to the research project by explaining the risk and improving the safety practices of the occupational group.

movement. Another factor was that the state-owned industry was in the midst of being privatized during the research. For a broader discussion of the union movement in Mexico during this period, see Matt Witt. 1991. "Mexican Labor: The Old, the New and the Democratic." *Multinational Monitor* January/February pp. 30-34. For a discussion of the privatization of the steel industry in Mexico and the resulting labour conflict, see Dan La Botz. 1992. *Mask of Democracy*. Montréal: Black Rose Books. pp. 76-80.

The case study shows that linkages and the involvement of stakeholders in research projects help to ensure that development impacts occur. The two government-based research projects (Colombia and Bolivia) directly or indirectly facilitated changes in legislation and regulations due to their ties to other governmental agencies. The Mexican and the Peruvian pesticides projects promoted linkages to the occupational groups studied and resulted in changes at the local level. Although the Mexican one did not completely reach its research objectives due to external reasons, members of the Peruvian pesticides research team maintained close contact with the occupational group studied which seemed to help ensure that changes within the occupational health and safety practices and of the delivery of occupational health services occurred.

Although the responses show a significant range of development impacts, the recipients though their could have been even more. Respondents to the questionnaire identified a number of factors which they thought might have impeded further development impacts. In fact, a significant proportion of the respondents to the questionnaire (56 %) indicated that they had expected the project to result in a greater impact at the local and national levels. Several impediments were mentioned. The most common one was lack of government support. The reasons given for this varied from overt resistance to the research to lack of competency of government officials in occupational health and safety. This complaint was mainly raised by researchers based in a university or a non-governmental organization, although two researchers from a government institute also complained of the lack of effective government support. The next most common impediment noted was employer resistance to change. Other barriers mentioned included the economic, political or social situation of the occupational group studied (e.g. their poverty prevented them from buying protective equipment, their illiteracy limited the extent of changes that occurred) and the need for more research and better dissemination of the results. Similar complaints were raised by the researchers involved in the case study projects. Those involved in the Mexican steelworker project underlined how employer antagonism towards the trade union and its members meant not only limited change in occupational health and safety practices in the industry but also prevented the researchers from taking measurements of the working environment.⁴³

5.4 Community Development Output

In the questionnaire, projects that sought to build the capacity of the occupational group studied and/or its organization to participate in the assessment or enforcement of occupational health and safety were very successful: 16 of the 17 projects with this aim succeeded (94 %). Including those projects that did not state a specific objective to effect change but nevertheless led to that result, 49 % of the projects facilitated the strengthening of the

⁴³ Junior researchers of the project informed me that by the end of the project, management of the steel industry had placed pictures of the two co-principal investigators by all the entrances to ensure that guards would not allow them entry into the premises.

capacity of the occupational group studied and/or its organization to participate in the assessment or enforcement of occupational health and safety.

In the case study, two of the projects had a stated aim of this objective. The Peruvian pesticide project sought to involve community health promoters in the study area in the monitoring of pesticide poisoning. They successfully achieved this aim. Furthermore, the people interviewed in this case study also noted that the project indirectly contributed to an increased consciousness about chemical risks overall as members of the studied occupational group successfully led a campaign against the use of DDT in a subsequent government anti-malaria spraying in their community. The Mexican project sought to involve workers in the monitoring of occupational health and safety risks in the steel industry. It was ultimately unsuccessful, as noted above, due to external factors. However, it still had unintended development impacts due largely to the active involvement of workers and the trade union in its research activities. One such indirect impact was the raising of the workers' consciousness about occupational risks. A government official with the National Institute of Social Security in an interview partially attributed the activities of the researchers and the local union during the project with an increase in compensation claims submitted by workers at the research site immediately after the completion of the project.

The questionnaire responses suggest that the projects that sought to mobilize an occupational group in regards to the assessment and/or enforcement of occupational health and safety were generally very successful. The case studies show that whereas external factors may negatively affect the possibility for success, there may also be indirect benefits of research with this aim by increasing the general awareness of occupational risks of the occupational group studied.

5.5 Information System Output

There were two types of aims for projects that sought to have an impact on information systems: the organization of information and the dissemination of information. Out of the 13 projects seeking to change the type and organization of occupational health and safety information, 10 were successful (77 %). Twelve of the 15 projects (80 %) that aimed to change the accessibility of occupational health and safety information were successful.

Including those projects that did not state a specific objective to effect change but nevertheless led to that result, there were positive impacts achieved. Forty per cent of all the projects facilitated a change in the type and organization of occupational health and safety information. Of the projects which assisted changes in this area, some of the changes included: better organized accident reports (18 % of the changes); creation of links to international databases on occupational health and safety (18 %); better organized government safety inspection reports (20 %); compilation of national data on hazardous materials (22 %); and compilation of national data on factories' safety standards (22 %). Thirty-eight per cent of all the projects resulted in a change in the accessibility of

information on occupational health and safety. Of the projects which facilitated changes in this area, some of the changes included: making occupational health and safety data accessible to the public (19 % of the changes); providing occupational health and safety data to trade unions (23 %); providing occupational health and safety data to the government (28 %); and providing occupational health and safety data to employers (30 %).

No projects in the case study were concerned with changing the information on occupational health and safety.

5.6 Institutional Arrangements of Research Group

I correlated the answers to the number of stakeholder groups participating in research activities with the number of impacts on the local and national levels for each project. Respondents were free to identify nine possible groups or individuals in the involvement section: the studied occupational group; government officials; employer; unions; employers' association; community groups; occupational or other health practitioners; occupational health association; university lecturers.⁴⁴ In my analysis, I selected four of the development impacts at the local and national levels: changes in legislation, regulations, delivery of occupational health services, and occupational health and safety practices.

However, I was not confident that the respondents held similar understandings of the meaning of participation in research activities. This uncertainty was based on the fact that the definition of "involvement" during the structured interviews of the case-study encompassed a range of roles and responsibilities. For a number of researchers, administering medical tests to the subject group was taken as evidence of the involvement of the occupational group in the research. This type of involvement significantly differed from that in the Mexican project where members of the occupational group sat on a steering committee overseeing the research itself. Thus, it can be seen that "involvement" may signify a broad spectrum of participation, from agreeing to be examined to playing an active role in research activities.

To give a better idea of which stakeholder groups might have been actively involved in research activities of the surveyed projects, I looked at the answers to the questions concerning the dissemination of the research results. In the case study, the groups which received the projects results in some form (e.g. as a report, in a project-end workshop, etc) were more likely to have been actively involved in research activities. Members of these groups generally were knowledgeable about the findings and were able to explain to the

⁴⁴ I excluded "university lecturers" as a group from my analysis since I assumed that their presence as a stakeholder was less vital than the other groups in terms of having an impact in these areas.

interviewer how the project affected their own understanding of and approaches to the specific occupational health and safety problem(s) studied. Those who did not receive the research results, even if the researchers had stated that they were directly involved in the research, indicated to the interviewer that the project had no impact on their understandings or approaches to the specific occupational health and safety problem under study.

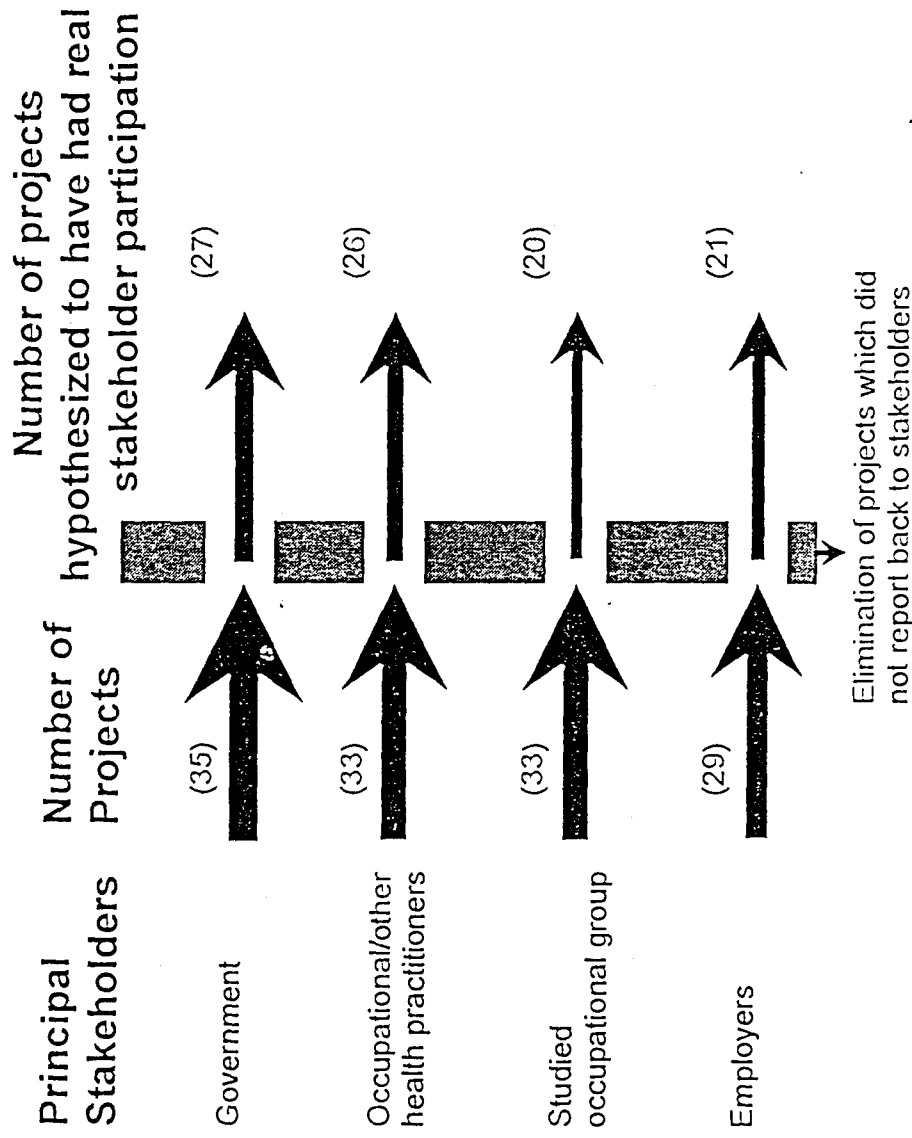
Based on this evidence from the case study, I hypothesized that those groups which, according to the respondents, both participated in research activities and received research results had been actively involved in the research at some level. The total number of projects with a reported participation of the principal stakeholder groups was reduced once I also took into consideration this dissemination of research results ([Figure 9](#)). The most notable reduction concerned the participation of the studied occupational group. Respondents for 33 projects indicated that this stakeholder participated in the research activities. After I considered which projects also reported back the project results to the studied occupational group, there remained 20 projects that I hypothesized had real participation of this stakeholder.

In terms of the number of different stakeholders involved in the research projects, my analysis showed that 23 of the 38 projects (61 %) had five or more groups participating in the research activities. All of these projects resulted in at least one category of development impact. Over a third of them resulted in 3 to 4 changes at the local or national levels. This data suggests that the greater the number of stakeholders, the greater likelihood of the research project to result in a development impact.

I then examined whether certain stakeholders were more involved than others in the research projects that led to each of the four development impacts ([Table 8](#)). Government was present in the majority of the projects which resulted in all four changes, though more predominantly in those that led to policy changes. Eighty per cent or more of the projects that led to changes in regulations, delivery of occupational health services and legislation had secured government involvement. According to the results, the involvement of (national) associations of employers and occupational/other health professionals is important if a project is to have an impact on legislation. Occupational/other health practitioners were significant participants in the majority of projects which resulted in changes in all four types of impacts, particularly those at the local level where 88 % of the projects that led to changes in the delivery of occupational health services and 87 % of those that resulted in changes to occupational health and safety practices reported involvement of these practitioners. The involvement of employers and members of the studied occupational group is important for other types of changes, particularly at the local level. Employers were involved in 71 %, and the studied occupational group in 65 %, of the projects that resulted in a change in the delivery of occupational health services. Both were involved in 70 % of those that facilitated changes in occupational health and safety practices.

The results show that an increased number of stakeholders involved in a project led to a greater probability of the research resulting in impacts at the local and national levels. The

Figure 9 Stakeholder involvement in projects



KEY

This diagram illustrates the process used to interpret questionnaire responses relative to stakeholder group involvement, based on the results of the case-study. The proportional arrows represent the (number) of projects which were reported to have involved the principal stakeholders (government, occupational/other health practitioners, studied occupational group, and employers). The vertical wall filters out the projects which did not indicate that results were reported back to those principal stakeholders.

most important stakeholders in the surveyed projects were governmental bodies, employers and their association(s), occupational/other health practitioners and their associations, and the studied occupational group. Over 85 % of those projects in which these groups were involved led to a development impact. I expected that the involvement of government and employers would be important for these development impacts to occur, given the powerful role both play in terms of setting occupational conditions. Likewise, the involvement of the studied occupational group in the projects which led to more local impacts is not surprising. By involving the people most directly involved in the impacts, there should be a greater chance of success. However, the importance of occupational/other health practitioners was not expected. The data shows that the involvement of these practitioners was clearly significant in the research projects which had development impacts. They suggest that occupational/other health practitioners are important stakeholders if the implementation of research results are to be achieved.

Table 8 The influence of specific stakeholder groups on project success in achieving selected development impacts

Type of Change Achieved Successfully	Stakeholder Groups Involved	Presence of Stakeholder Groups in Research Activities
Legislative	Government	100 %
	Occupational/other Health Practitioners	89 %
	Occupational Health Association	78 %
	Employers' Association	67 %
Regulatory	Government	82 %
	Occupational/other Health Practitioners	82 %
	Employers	64 %
	Employers' Association	64 %
Occupational Health Services Delivery	Government	88 %
	Occupational/other Health Practitioners	88 %
	Employers	71 %
	Studied Occupational Group	65 %
Occupational Health and Safety Practices	Occupational/other Health Practitioners	87 %
	Government	74 %
	Employers	70 %
	Studied Occupational Group	70 %

The five case study projects confirm the trends found in the questionnaire responses. The two projects that facilitated legislative changes were not only both carried out by governmental institutions (Colombian paraquat and the Bolivian pesticide projects), but they also involved other government ministries in the research. The project that had the greatest and most direct impact at the local level (the Peruvian pesticide project) actively involved numerous stakeholders in the research and the dissemination of the results, including local health practitioners, other local government personnel, and the studied group itself. The local health practitioners, including community health promoters, played a crucial role in carrying out the research, disseminating the results to the occupational group, and in promoting the recommended changes to occupational practices. Moreover, the researchers continued research and extension work in the community after the donor support finished for their project. The project that had the least impact in the local and national levels (the Peruvian high altitude project) had very little involvement of any group. Although it generated important fundamental research results, the use of these results at the local or national levels had not materialized three years after the project was completed.

In addition to the lack of involvement of any stakeholder, another factor that may have impeded the Peruvian high altitude project in having a development impact was employer resistance to any improvement of occupational health and safety practices. For instance, the medical official employed by the mine hypothesized in an interview why he was ignorant of the results of the project. He reasoned that the owners of the mine would not want to show him, and definitely not the workers, any scientific results which might show that working conditions contribute to ill-health, lest it be taken up by workers as a compensatable illness. The Mexican project also faced hostility by the employer to its recommendations. That the latter project resulted in some development impact at the local level is due, I suggest, to the fact that members of the local occupational group and its trade union were actively involved in the research activities.

In summary, the involvement of several groups of stakeholders in research projects had a demonstratable effect on the number of development impacts resulting from them. The greater the number of stakeholders involved, particularly of certain specific groups (governmental bodies, occupational/other health practitioners, employers, the studied occupational group), the greater likelihood that development impacts resulted from the research.

6. Conclusion

I will first summarise the results of my analysis of the IDRC-supported projects in occupational health and safety. I then end with a brief discussion of lessons learned for IDRC.

6.1 Reach and Impact of Occupational Health and Safety Projects in Development

From my study of the 38 research projects supported by IDRC between 1979 and 1992, I conclude that IDRC-supported occupational health and safety research projects had an important impact on national development processes. The majority of the projects under study did build research capacity, advancing the careers of those scientists involved and significantly increasing the capacity of the recipient institutions to carry out further research, particularly those based in government institutions. There is clear indication as well that this international research support helped to stem the "brain-drain" from developing countries. By strengthening capacity of local scientists and institutions, the projects had a positive impact on the development of further research programs in occupational health and safety. The projects have also facilitated considerable changes in both the policy environment and the health and safety practices of occupational groups in developing countries. These changes assist the improvement of the health of working people which, in turn, has wider ramifications on the efficiency of enterprises and on the welfare of the larger communities.

A strong theme emerging from the study was that effective and broad dissemination of research results and the involvement of numerous stakeholders in the research greatly contributed to a development impact. Other scholars have commented on the importance of taking occupational health and safety research outside the realm of pure science and either linking it with external factors such as policy development⁴⁵ or carrying it out with the active participation of the occupational group itself.⁴⁶ My study suggests that there is a greater potential for achieving a positive impact when governmental agencies, occupational/other

⁴⁵ See, for example, J. Jeyaratnam. 1992. "Introduction." in J. Jeyaratnam (ed). *Occupational Health in Developing Countries*. New York: Oxford University Press; F. White 1993. "Health-risk assessment of pesticides: development of epidemiologic approaches." In G. Forget, T. Goodman, and A. de Villiers (eds). *Impact of pesticide use on health in developing countries*. Ottawa: IDRC. pp.20-21.

⁴⁶ See, for example, R. Loewenson, A.C. Laurell, and L.C. Hogstedt. 1995. "Participatory approaches in occupational health research." *International Journal of Occupational and Environmental Health* 1:121-130; N. Tandhanskul, S. Duangsa-ad, C. Pongpanich, et al. 1995. "Experiences of successful action. Programmes for occupational health, safety, and ergonomics in small scale enterprises in Thailand." *Journal of Human Ergology*. 24:105-115.

health practitioners, employers and the studied occupational group are involved in the research.

The argument has been made that there is a need for improved occupational health and safety as a component of development programs. My study demonstrates that research projects play an important role in fulfilling this need. The present study also shows that factors external to the research project significantly affect the development impacts of such projects. It also provides strong evidence that occupational health and safety research support in developing countries is a worthwhile endeavour for international donor agencies.

6.2 Lessons Learned for Future Project Development at IDRC

What lessons can be learned for IDRC from this impact assessment of IDRC-supported occupational health and safety projects? I will limit my comments to project development and evaluation.

Beginning with evaluation, I realised in the course of carrying out my case study that on-site evaluation of completed projects is very beneficial. The on-site case study not only allowed me to document some of the impacts of the projects for this study, but it also facilitated further linkages. For instance, my wish to talk with members of the studied occupational group of the projects brought back the principal investigators of both the Colombian and the Bolivian projects to the study area for the first time since their research was completed. The meeting in Bolivia resulted in a direct benefit for some members of the agricultural community visited. Responding to requests by some farmers, members of the institute for occupational health, the recipient institution of the project, agreed to set up a training course for the community on pesticide safety. In Colombia, the local hospital finally gained the results of the study. The principal investigator had brought extra copies of the results and left it with the head of the hospital. Both activities are a direct result of organizing an on-site meetings with the intended beneficiaries, other stakeholders, and the principal investigator.

After I finished asking questions during an interview with a local doctor concerning the Colombian paraquat project, the doctor directly asked me to explain why it took IDRC so long to return to the area of research after the project was completed (five years previously). I had no answer, other than it is not IDRC policy. It is a policy, which I suggest, should be reconsidered. I thus strongly support what at least one other⁴⁷ has recommended: IDRC should formalize some form of on-site evaluation after funded projects are completed.

⁴⁷ Wm. C. Found. 1995. *Participatory Research and Development: An Assessment of IDRC's Experience and Prospects*. A Report to IDRC, #000931/94-0817. pp.69-70.

In terms of project development, my study supports claims made by others⁴⁸ that the greater involvement of different stakeholders helps to ensure a greater impact of development projects. It also identified certain stakeholders which seemed to have a greater role in facilitating certain impacts for occupational health and safety projects. At the same time, my study indicated that external factors played a role in translating research into a development impact. I could not expand on this point given the limited period of, and resources available for, my case study. However, given the information solicited concerning employer hostility towards improvement of working conditions for both the Peru high altitude and the Mexican steelworker projects, it is not surprising that "unions" was not identified as an important stakeholder to be involved in projects that contribute to many impacts. Hostility held by some employers (often with the tacit support of the state) towards the improvement of working conditions, I speculate, is the reason for this absence, rather than some failing on the part of trade unions.

The study also specified that dissemination of results is an important component of stakeholder "involvement." I suggest that there should be a strong emphasis on future research recipients of IDRC-support to carefully think about, and budget for, an effective dissemination of research results to key stakeholders of the research.

As for the future status of occupational health and safety projects at IDRC, I look at the results of my study and suggest that it would be a loss if IDRC does not resume supporting projects in this field. IDRC has built up a solid reputation over the years within the international field of occupational health and safety and development as one of the few donors to support research in this area. In addition to this important point of continuity and building on the institutional strengths of IDRC, there is the ethical point that workers tend to be overlooked by policy-makers in the South, a tendency which many development organizations replicate. Yet occupational groups have always been strongly affected by various development policies and projects. For instance, research that addresses changes in macroeconomic policies, processes of environmental degradation, and the introduction of new agricultural technologies without concomitant research on the effects of these on the health and safety of particular occupational groups is, in my opinion, taking a far too narrow perspective of development. The multidisciplinary, cross-sectoral focus of the new program initiatives of the Centre should mean that research that looks at, or includes a component on, occupational health and safety would comfortably fit in the restructured IDRC. If so, the significant development impacts already achieved by IDRC-supported research on occupational health and safety could continue and, perhaps, be improved upon.

⁴⁸ See, for instance, the various contributions in the following two World Bank publications: Bhuvan Bhatnagar and Aubrey C. Williams (eds.). 1992. *Participatory Development and the World Bank: Potential Directions for Change*. Washington: World Bank; World Bank. 1995. *World Bank Participation Sourcebook*. Washington: World Bank, Environment Department, Social Policy and Resettlement Division.

APPENDIX 1: Components and Indicators for Impact Assessment

Objective: to assess the "impact" and reach of IDRC-funded OHS projects in light of current and future research possibilities

Component	Indicator	Sub-Indicator/Evaluatory Question
1. Capacity-Building of individuals and institutions (skills, connections, training, research)	1.1 Further OHS research by recipients, collaborators, and any targeted groups	* any further research on OHS? * what role, if any, did the project have on ability/inability to do further research?
	1.2 Further OHS research by others	* any research carried out by others on OHS in country? * what role, if any, did the project have on this?
	1.3 Career trajectory of recipients, collaborators, and others involved	* how did the involvement in the project affect participants' career paths? * what personal contacts/networks were developed out of this project?
	1.4 Training carried out in project	* what type of training did various participants receive? * how have those skills been used today?
	1.5 Equipment provided to institution	* what type of equipment did the project provide to the recipient institution? * how is that equipment being used today?
	1.6 Linkages and reputation developed for institution from project	* what type of "spin-offs" (positive and negative) occurred for the recipient institution from their involvement in the project (e.g. additional or less research/funding, etc)?
	1.7 OHS Professional and Training Institutes/ Government Departments	* what type of OHS professional and training institutes exist in the country? * how many OHS professionals/trainers are there in the country? * do the people in these institutes know about the project? * were they involved in the project in any way? * did the project have any effect on their institution (in terms of increasing technology available, facilitating/destroying linkages, etc)? * did the project have any effect on the status of and role played by the Government department in OHS and within Government policy?
2. Research Output (data and methods)	2.1 Production of methodologies/diagnostic criteria	* what methodologies or diagnostic criteria were developed out of the project? * are they being used by anyone today?
	2.2 Production of databases	* what type of scientific database was created? * how is it being used today?

Component	Indicator	Sub-Indicator/Evaluatory Question
3. Policy and Practice Output (OHS legislation, regulations, and practices)	2.3 Scientific Quality of Research	* what were scientific strengths/weaknesses of the project? * what were reasons for this? * number and type of publications? * number and type of citations?
	2.4 Dissemination of Results	* who received the results of the research? * why did these people receive them? * what feedback, if any, was given and any follow-up to it?
	3.1 Legislative Change	* what has been the legislative change regarding OHS since the project began? * what role, if any, did the project have on this?
	3.2 Regulatory Change	* what have been the changes in the particular regulatory environment of OHS since the project began? * what role, if any, did the project have on them?
	3.3 OHS delivery system	* what type of changes have occurred to the delivery system of OHS since the project began? * what role, if any, did the project have on them?
4. Community Development Output (Worker/ Community Involvement)	3.4 OHS practices in project area	* any specific OHS interventions arising from project? * number of accidents/injuries in workplace/sector/country before and after project? * are workers/managers aware of OHS (any difference between old/new personnel in terms of time of the project)? * what are the impressions of workers/managers of project impact?
	4.1 Assessment of Worker/Community Involvement	* the utility of worker/community involvement in and knowledge of OHS? * role played, if any, of project in this assessment?
	4.2 Degree of Worker/Community Involvement	* how are workers/community involved in OHS assessment and enforcement? * how has the project affected this involvement? * were there any direct consequences (positive and negative) on workers/community due to their involvement in the project?
5. Information System Output	5.1 Change in Information Sources for OHS	* has there been any qualitative/quantitative change in information sources for OHS since the project? * what role, if any, did the project have on these changes?

Component	Indicator	Sub-Indicator/Evaluatory Question
	5.2 Dissemination of OHS Information	* has there been any changes in the reach of dissemination of OHS information? * who receives OHS information on a regular/irregular basis from which source? * how is this information used? * what role, if any, has the project had on the dissemination and use of OHS information?

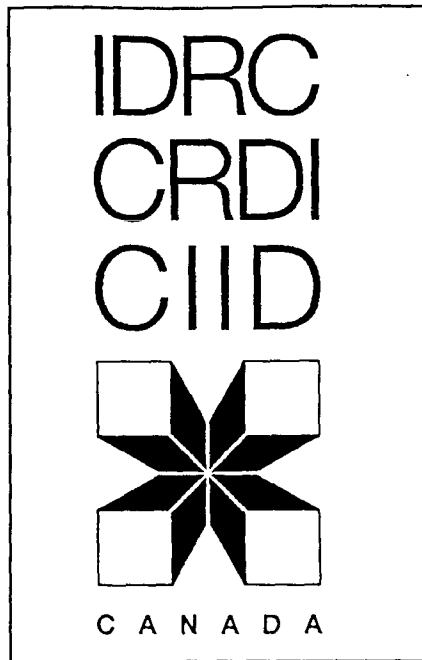
Key: OHS Occupational Health and Safety

APPENDIX 2: List of IDRC Occupational Health and Safety Projects Examined

79-0070	Industrial Health (Thailand)
80-0030	Silicosis (Sudan)
80-0040	Occupational Health Inventory (Singapore)
81-0206	Byssinosis (Hong Kong)
81-0210	Occupational Injuries (Korea)
81-0211	Health/Banana Workers (Honduras)
81-0219	Byssinosis (Indonesia)
82-0138	Flour-Dust Hypersensitivity (Sudan)
82-0163	Les Pneumoconiosis (Tunisie)
82-0221	Occupational Health in Small-Scale Industries (S.E. Asia)
83-0086	Health of Working Mothers (Hong Kong)
83-0089	Pesticide Poisoning (S.E. Asia)
83-0136	Pneumoconiosis (Korea)
83-0274	Trade Union Research Capacity (Kenya)
83-0303	Pneumoconiosis (India)
83-0309	Cost-Benefit Analysis of Industrial Safety (Korea)
83-1024	Leukopenia (China)
84-0177	Dock Handling Accidents (Kenya)
84-0178	Workers' Exposure to Solvents (Kenya)
84-0279	Paraquat Intoxication (Columbia)
85-0268	Occupational Health of Women (Korea)
85-1044	National Occupational Health & Safety Information Centre (Thailand)
86-0081	Occupational Health Profiles (Egypt)
86-0082	Pesticide Intoxication (Egypt)
86-0083	Pyrethroid Poisoning (China)
86-0219	Empoisonnement des Travailleurs par les Pesticides (Bolivie)
86-0281	Pesticide Exposure (Philippines)
86-0295	Pesticide Handling (Kenya)
86-0304	Occupational Airway Disease Among Coffee Dust Workers (Uganda)
87-0155	Occupational Health in Metal Industry (Mexico)
87-0287	Pesticide Poisoning (Jordan)
88-0171	East Africa Pesticide Network
88-0186	Occupational Health and Rural Community Education (Peru)
88-0329	Byssinosis (China)
88-0351	Occupational Health (Tanzania)
89-0086	Occupational Health and Safety Information and Documentation Centre (Malawi)
89-0244	Occupational Health and Safety in the Cotton Industry (Uganda)
89-0247	High Altitude and Mining (Peru)
89-0289	Pyrethroid Poisoning (China) Phase II
89-0326	Evaluation of Occupational Health Services System (Korea)
89-1032	Underground Mine Support (Zimbabwe)
90-0032	Pesticide Intoxication (Egypt) Phase II
90-0067	Profils de Travail Feminin, Strategies de survie et Santé (Equateur)
90-0080	Workers' Participation (Zimbabwe)
90-0081	Leishmaniasis Phase II, Andean Leishmaniasis Control (Peru)
90-0101	Occupational Lung Disease (Indonesia)

- 90-0295 Pesticide Safe Use (Thailand)
- 91-0098 Occupational Health and Safety Information Systems (Kenya)
- 91-0275 Agrochemicals and Farmworkers (South Africa)
- 92-0204 Steelworkers' Health (Brazil)
- 92-0211 Capacity Building for Research in Occupational Health (Latin America)
- 92-1055 Urban Echinococcosis in Health Transition (Népal)
- 92-8169 Workers' Health and Safety (West Africa)
- 95-1050/01023 Projet de formation à la recherche dispensée en français pour la santé au travail en Afrique (West Africa)

APPENDIX 3: Questionnaire



Questionnaire of Principal Investigators of IDRC-Supported Occupational Health and Safety Research Projects (November 1995)

Instructions

1. Please answer each question by circling the appropriate answer in the right-hand column and/or writing a response or comments in the space provided.
2. If you use any additional sheets of paper to complete your answers, please attach them to the back of this questionnaire when you return it.
3. When finished completing the questionnaire, please mail it in the provided self addressed envelope or in an envelope addressed to:
Blair Rutherford, Health Sciences
c/o Dr. Gilles Forget
IDRC/CRDI/CIID
P.O. Box/ BP 8500
Ottawa, Canada, K1G 3H9
4. For those who are able to fax the questionnaire, it would be appreciated if you fax it to:
(613) 567-7748.
5. If you wish, you may use electronic mail to answer this questionnaire. To do so, please provide the appropriate answer to each question and send the completed questionnaire to:
Brutherford@IDRC.Ca .
6. Your answers will be confidential. Any direct reference to your project or questionnaire will be shown to you before publication. A copy of the final report will be provided to all participants.

Personal Information

Name _____

Date Answered Survey ____/____/____
 dd mm yy

Publications (please list any publications which resulted from this IDRC-supported project written by you or by any other author, including the year of publication, the title, and the journal or publisher).

(If additional space is required, please continue on a blank sheet of paper).

I. Individual Impact

1. What is your current job position?

2. a) Has your job position changed since you obtained the IDRC-supported project?

Yes/No

If you answered "Yes", please answer Question 2 b).

If you answered "No", please go directly to Question 3.

b) Do you think that your role in this project influenced your change of job position?

Yes/No

3. a) Since obtaining the IDRC grant, have you obtained any other research grants?

Yes/No

b) Are you currently seeking funds for research from any agency?

Yes/No

If you answered "Yes" to either 3 a) or b), please answer Question 3 c).

If you answered "No", please go directly to Question 4.

c) Do you think that the IDRC-supported project influenced any of your other research projects or proposals for funding in any way?

Yes/No

4. Has the IDRC grant helped you to build ties with any of the following:

-Government officials

Yes/No

-Leaders of Community Organisations

Yes/No

-Trade Union officials

Yes/No

-Employers' Association officials

Yes/No

-Researchers in your country

Yes/No

-Researchers in other Southern countries

Yes/No

-Researchers in Northern Countries

Yes/No

-Others (please describe) _____

Yes/No

II. Institutional Impact

5. a) To the best of your knowledge, has the institution to which you were attached for the IDRC-supported project increased or decreased its number of research projects in occupational health and safety since your project began?

Increased/
Decreased/
Stayed Same

b) In your opinion, has (did) the IDRC-supported project contribute to any increase or decrease which occurred?

Yes/No/
I do not know

- | | | |
|-------|--|--------|
| 6. a) | In your own opinion, has the IDRC-supported project had any of the following impacts on this institution during, or shortly after the completion of, the IDRC-supported project: | |
| | -Updated Research Equipment | Yes/No |
| | -Improved training of staff | Yes/No |
| | -Favoured the development of other research projects | Yes/No |
| | -Impeded the development of other research projects | Yes/No |
| | -Strengthened ties to the Government | Yes/No |
| | -Weakened ties to the Government | Yes/No |
| | -Increased ties to Community Organisations | Yes/No |
| | -Decreased ties to Community Organisations | Yes/No |
| | -Increased ties to Trade Unions | Yes/No |
| | -Decreased ties to Trade Unions | Yes/No |
| | -Increased ties to Employers' Associations | Yes/No |
| | -Decreased ties to Employers' Associations | Yes/No |
| | -Other impact (please describe) _____ | |
| b) | In your own opinion, has the IDRC-supported project had any of the following impacts on this institution several years after the completion of the IDRC-supported project: | |
| | -Updated Research Equipment | Yes/No |
| | -Improved training of staff | Yes/No |
| | -Favoured the development of other research projects | Yes/No |
| | -Impeded the development of other research projects | Yes/No |
| | -Strengthened ties to the Government | Yes/No |
| | -Weakened ties to the Government | Yes/No |
| | -Increased ties to Community Organisations | Yes/No |
| | -Decreased ties to Community Organisations | Yes/No |
| | -Increased ties to Trade Unions | Yes/No |
| | -Decreased ties to Trade Unions | Yes/No |
| | -Increased ties to Employers' Associations | Yes/No |
| | -Decreased ties to Employers' Associations | Yes/No |
| | -Other impact (please describe) _____ | |

III. Involvement of Groups in Research

7. Please indicate which of the following organisations or individuals participated in the implementation of the IDRC-supported research:

-Occupational group studied	Yes/No
-Employers of work site studied	Yes/No
-Community Organisations	Yes/No
-Trade Unions	Yes/No
-Employers' Association	Yes/No
-Government Officials	Yes/No
-University Lecturers	Yes/No
-Occupational Health Professional Association	Yes/No
-Occupational Health Practitioners	Yes/No
-Others (please describe) _____	

If your IDRC-supported research project is complete, please answer Questions 8 and 9.

If your project is still active, please go directly to Question 10.

8. Please indicate how the research results have been made available to the following groups or whether the results were not given to the group (please place an "X" in the appropriate box or describe the way in which the results were presented to a group):

Groups	Final Report	Work-shop	Video	Another way (please describe)	Results were not given
Group Studied					
Employers of Work Site					
Community Organisations					
Trade Unions					
Employers' Associations					
Government Officials					
University Lecturers					
Occupational Health Association					
(Occupational) Health Practitioners					
Others (please describe)					

9. In your opinion, were there any groups which should have received the results of the research but did not?

Yes/No

Please briefly explain your answer.

(If additional space is required, please continue on a blank sheet of paper).

IV. Changes in Policy and Practices

10. Please indicate in the following table whether your IDRC-supported project has resulted, or is expected to result, in any changes in legislation, regulations, (occupational) health delivery services, or the occupational health and safety practices in the area studied and whether these changes were expected in the project objectives.

	<i>Any Resulting Changes? (Yes/No)</i>	<i>Changes Occurred or Expected in Near Future? (Past/Future)</i>	<i>Was this expected as part of the Project Objectives? (Yes/No)</i>
Legislation			
Regulations (e.g. labour agreements)			
(Occupational) Health Delivery (e.g. available medical services)			
(Occupational) Health and Safety Practices in Area of Study			

Please briefly list each change indicated in the above table.

(If additional space is required, please continue on a blank sheet of paper).

11. Did you expect more changes in legislation, regulations, (occupational) health delivery system, or the occupational health and safety practices in the area of study resulting from the IDRC-supported research than what have occurred (so far)?

Yes/No

If you answered "Yes", please briefly explain why you think that the changes have not occurred.

(If additional space is required, please continue on a blank sheet of paper).

V. Degree of Participation in Occupational Health and Safety

If your project contained objectives related to facilitating the participation of workers or community members in occupational health and safety, please answer Questions 12, 13, and 14.

If not, please go directly to Question 15.

12. a) Has your IDRC-supported project increased or decreased the participation of workers or community members in the assessment or enforcement of occupational health and safety in the study area.

Increased/
Decreased/
I do not know

- b) Was this increase or decrease expected as part of the project objectives?

Yes/No

13. a) In your opinion, did the IDRC-supported research strengthen or weaken any community organisations in the study area?

Strengthen/
Weaken/
I do not know

- b) Was this result expected as part of the project objectives?

Yes/No

14. a) Did you expect more or less changes in the participation of workers or community members in occupational health and safety practices resulting from the research than what have occurred (so far)?

Yes/No

- b) Please briefly describe what you think are the constraints or enabling conditions that have influenced the degree of participation of workers or community members.

(If additional space is required, please continue on a blank sheet of paper).

VI. Occupational Health and Safety Information

If your project contained objectives related to facilitating the improvement of information sources and/or management in occupational health and safety (e.g. compilation of accident reports), please answer Questions 15, 16, and 17. If not, please go directly to Question 18.

- | | |
|---|--------------------------|
| 15. a) Have there been any changes in the type and organisation of information on occupational health and safety resulting from your IDRC-supported project? | Yes/No/
I do not know |
| b) If you answered "Yes", please answer whether any of the following changes occurred or not as a result of the IDRC-supported project: | |
| -Compilation of data on hazardous materials in the country | Yes/No |
| -Compilation of data on factories' safety standards in the country | Yes/No |
| -Better organisation of occupational accident reports | Yes/No |
| -Better organisation of government safety inspection reports | Yes/No |
| -Links to international data-bases on occupational health and safety | Yes/No |
| -Regular production of newsletter on occupational health and safety | Yes/No |
| -Other changes (please describe) _____ | |
| c) Were these changes expected as part of the project objectives? | Yes/No |
| 16. a) Have there been any changes in the accessibility of information on occupational health and safety resulting from your project? | Yes/No/
I do not know |
| b) If you answered "Yes", please answer whether any of the following changes occurred or not as a result of the IDRC-supported project: | |
| -Occupational health and safety data is provided to government officials | Yes/No |
| -Occupational health and safety data is provided to trade unions | Yes/No |
| -Occupational health and safety data is provided to employers | Yes/No |
| -Occupational health and safety data made accessible to the public | Yes/No |
| -Other changes (please describe) _____ | |
| c) Were these changes expected as part of the project objectives? | Yes/No |
| 17. a) Did you expect more or less changes in the type and organisation of information on occupational health and safety and its availability resulting from your research than what has occurred (so far)? | Yes/No |

b) Please explain why you think that these changes have (not) occurred.

(If additional space is required, please continue on a blank sheet of paper).

VII. Personal Assessment of Project and Future Research

18. a) To the best of your knowledge, has there been any new research building on the results of your project?

Yes/No

b) If you answered "Yes", were you involved in this follow-up research?

Yes/No

19. In your opinion, should there be any (further) research following up the results of your project?

Yes/No

Please briefly explain your answer.

(If additional space is required, please continue on a blank sheet of paper).

20. a) In your opinion, has the number of occupational health and safety research projects in your country increased, decreased, or stayed the same since you obtained your IDRC-supported research project?

Increased/
Decreased/
Stayed same

b) Please give a rough assessment of this increase or decrease (using percentages, if possible).

(If additional space is required, please continue on a blank sheet of paper).

21. a) In your opinion, what have been the strengths of your IDRC-supported research project?

(If additional space is required, please continue on a blank sheet of paper).

- b) In your opinion, what have been the weaknesses of your IDRC-supported research project?

(If additional space is required, please continue on a blank sheet of paper).

- c) In your opinion, what may have prevented greater impacts of your IDRC-supported research?

(If additional space is required, please continue on a blank sheet of paper).

Please provide any other comments you want to make concerning your IDRC-supported project.

(If additional space is required, please continue on a blank sheet of paper).

Thank you for completing this questionnaire.

**If you have any comments concerning this questionnaire,
please write them below and/or on an additional sheet.**

APPENDIX 4: List of those who were sent and those who responded to the Questionnaire

Dr. S.G. Ong
The Praise Assembly
P.O. Box 70030
Kowloon Central Post Office
Hong Kong

Responded for 81-0206

Prof. Dr. Karnen Baratawidjaja
Jalan Singamangaraja No. 49-51
Jakarta 12120
Indonesia

Responded for 81-0219

Dr. Benito R. Reverente, Jr.
PhilamCare Health Systems, Inc.
P.O. Box 2060
Manila 1000
Philippines

Responded for 82-0221

Dr. Tan Tah-Chew
Department of Community, Occupational,
and Family Medicine
National University of Singapore
Singapore 0511
Singapore

Responded for 83-0086

Dr. J. Jeyaratnam
Occupational Medicine Division,
Department of Community, Occupational, and Family Medicine
National University of Singapore
Singapore 0511
Singapore

Responded for 83-0089

Datuk Dr. R. Mahathevan
16 Jalan SS 3/72
47300 Petaling Jaya
Malaysia

Responded for 83-0089

Dr. S.K. Kashyap, Director
National Institute of Occupational Health
Meghani Nagar
Ahmedabad - 380016
India

Responded for 83-0303

Dr. Kwang-ho Meng
Dept. of Preventive Medicine & Biostatistics
Catholic Medical College
505 Banpo-dong, Soch'o Ku
Seoul 137-701
Korea

Responded for 85-0268

Dr. Chaiyuth Chavalitnitikul, Director
National Institute for the Improvement of
Working Conditions and the Environment
22/3 Boromrachachonnee Road
Thaling Chan
Bangkok 10170, Thailand

Responded for 85-1044

Professor Madbuli H. Noweir
Industrial Engineering Department
College of Engineering
King Abdul-Aziz University
P.O. Box 9027
Jeddah - 21413 Saudi Arabia

Responded for 86-0081

Professor Mahmoud M. Amr
Environmental & Occupational Medicine
Kasr El-Aini, Faculty of Medicine
Cairo University
Cairo
Egypt

Responded for 86-0082, 90-0032

Dr. Fengsheng He
Institute of Occupational Medicine
Chinese Academy of Preventive Medicine
29 Nan Wei Road
Beijing 100050
People's Republic of China

Responded for 86-0083, 89-0289

Mr. Mutuku Mwanthi
3822 North Braeswood Blvd. #67
Houston, Texas
U.S.A.

Responded for 86-0295

Dr. Violet Kimani
Department of Community Health
College of Health Sciences
University of Nairobi
P.O. Box 20723
Nairobi, Kenya

Responded for 86-0295

Dr. D. K. Sekimpi Medical Department Bank of Uganda P.O. Box 7120 Kampala Uganda	Responded for 86-0304
Dr. Charles F.L. Mbakaya Kenya Medical Research Institute P.O. Box 54840 Nairobi Kenya	Responded for 88-0171
Ms. A. Vera F. Ngowi Tropical Pesticides Research Institute P.O. Box 328 Arusha Tanzania	Responded for 88-0171
Dr. Jiang Chao-Quiang Guangzhou Occupational Disease Prevention and Treatment Centre Bai-Yun Mountain, Huang Po Deng Guangzhou 510420 People's Republic of China	Responded for 88-0329
Mr. J. C. Otim-Ogwal Factories Inspectorate Ministry of Labour P.O. Box 227 Kampala Uganda	Responded for 89-0244
Dr. Haoung Park Department of Preventive Medicine Catholic Medical College 505 Banpo-dong, Sach'o Ku Seoul 137-701 Korea	Responded for 89-0326
Dr. Rene Loewenson ZCTU Health and Social Welfare Dept. 50 Jason Moyo Ave. P.O. Box 3549 Harare Zimbabwe	Responded for 90-0080

Dr. Alejandro Llanos-Cuentas **Responded for 90-0081**
Instituto de Medicina Tropical "Von Humbolt"
Universidad Peruana Cayetano Heredia
Av. Honoro Delgada No. 430, URB Ingenieria
San Martin de Porras, A.P. 5045
Lima, Peru

Dr. Palarp Sinhaseni **Responded for 90-0295**
Pesticide Safe Use
Faculty of Pharmaceutical Sciences
Chulalongkorn University
Bangkok 10330
Thailand

Dr. J. E. Myers **Responded for 91-0275**
Department of Community Health
Medical School
Anzio Road, Observatory 7925
Cape Town
South Africa

Dr. Oscar Feo **Responded for 92-0211**
Post-Grad. Programme in Occupational Health
Facultad de Ciencias de la Salud
Apdo. 4810
Maracay 2101
Venezuela

Dr. Durga Datt Joshi **Responded for 92-1055**
National Zoonoses and Food Hygiene Research Centre
Tahachal, P.O. Box 1885
Kathmandu
Nepal

Mr. Hassan Adebayo Sunmonu **Responded for 92-8169**
Secretary General
OATUU
P.O. Box M386
Accra
Ghana

Dr. Wang Jueshang **Responded for 83-1024**
Dept. of Epidemiology, Sichuan Medical College
West China University of Medical Sciences
17 Renminnanlu, 3 Duan
Chengdu, Sichuan
People's Republic of China

Dr. Abdelaziz Ghachem
Departement de Santé Communautaire B
Faculté de Medecine & de Pharmacie de Tunis
138 Boulevard du 9 Avril 1938
1006 Tunis
Tunisia

Responded for 82-0163

Mr. Y.J. Kaminyoge
Factories Inspectorate
Ministry of Labour HQ
Private Bag 344
Lilongwe 3
Malawi

Responded for 89-0086

Dr. Malinee Wongphanich
39 Moo 16, Nakorn-Khaenkhan Rd.
Bangpeung, Phra-Pradaeng
Samutprakarn 10130
Thailand

Responded for 79-0070, 83-0089

Dr. William Sakari, Director
Directorate of Occupational Health& Safety Services
Ministry of Labour and Manpower Development
P.O. Box 40326
Nairobi
Kenya

Responded for 84-0177, 91-0098

Dr. Carmen P. Castaneda
1901 Grove Point Ct.
Raleigh, NC
27609
U.S.A.

Responded for 86-0281

Dr. Ramzi Sansur
Centre for Environment and Occupational Health
Birzeit University
P.O. Box 14
Birzeit
West Bank via Israel

Responded for 87-0287

Dr. Peter Kamuzora
Institute of Development Studies
University of Dar es Salaam
P.O. Box 35169
Dar es Salaam
Tanzania

Responded for 88-0351

Professor Seif-El-Din Gaafiar Ballal **Responded for 80-0030**
Dept. of Family and Community Medicine
College of Medicine and Medical Sciences
King Faisal University
P.O. Box 2114, Dammam 31451
Kingdom of Saudi Arabia

Dr. Zuheir Ibrahim Fakhri **Responded for 82-0138**
Occupational Health Department
Ministry of Health
PO Box 58475
Riyadh 11594
Saudi Arabia

Dr. Im Goung Yun **Responded for 83-0136**
Catholic University
Graduate School of Industrial Health
505 Banpo-dong, Sach'o Ku
Seoul 137-701
Korea

Dr. W.O. Phoon
P.O. Box 818
Pymble
Sydney, New South Wales
Australia 2073

Dr. Kyu Sang Cho
Department of Preventive Medicine
Catholic Medical College
505 Banpo-dong, Sach'o Ku
Seoul 137-701
Korea

Dr. German L. Zavala
Departamento de Medicina Preventiva y Social
Facultad de Medicina
Universidad Nacional Autónoma de Honduras
Comajay Vila -- Tegucigalpa D.C.
Honduras

Professor Stuart Donnan
Department of Epidemiology and Health Sciences
Victoria University of Manchester
Oxford Road
Manchester
England M13 9PL

Dr. Bae-Ho Hahn
Department of Political Science
Korea University
1 Anam Dong
Seoul 136-701
Korea

Ms. Grace Ohayo-Mitoko
Kenya Medical Research Institute
P.O. Box 54840
Nairobi
Kenya

Mr. Deo. Mfitumukiza
Occupational Health and Hygiene Department Ministry of Labour
P.O. Box 4637
Kampala
Uganda

Mr. Muwinda Lipalile
Institute of Mining Research
University of Zimbabwe
P.O. Box MP167
Mount Pleasant, Harare
Zimbabwe

Dr. Sandhi Maria Barreto
Rua Agena 270
30 360.730
Bela Horizonte
M.G. Brazil

Mr. O. Norman Wambayi
Ministry of Research, Technical Training & Technology
P.O. Box 30568
Nairobi
Kenya

Dr. P.K. Sumamur
National Centre of Industrial Hygiene
Badan Penelitian dan Pengembangan Kesehatan
Jl. Percetakan Negara No. 29
Jakarta Pusat 10560
Indonesia

Mr. Djanarto Tanuredjo
Direktorat Jenderal Pembinaan Hubungan Industrial dan Pengawasan Ketenagakerjaan
Jl. Jend. Gatot Subroto Kav. 51
Jakarta Selatan
Indonesia

Dr. M. Rajendra
300/2 High Level Road
Colombo 6
Sri Lanka

APPENDIX 5: List of People Interviewed and Places Visited for Case Study

<u>Date</u>	<u>Location</u>	<u>People</u>
January 29 1996	Mexico City, Mexico	Cristina Laurell, Co-Principal Investigator Mariano Noriega, Co-Principal Investigator Oliva Lopez Arellano, Researcher Susana Martinez, Researcher Jorge Villegas, Researcher Jose Miguel Ramos-González, Mexican Institute of Social Security
January 30	Mexico City, Mexico	Gloria Tello, SEDEPAC (NGO)
January 31	Mala Valley, Peru	Dr. Chavez, former director of Mala Health Centre Fredy, Farmer and Agricultural Demonstrator Alejandro, Head of Health Promoters Directors of Regional Health Services Juan Carlos, Agricultural Demonstrator
February 1	Lima, Peru	Emma L. Rubin de Celis, Principal Investigator José Luis Bazo Rotles and other researchers from Huayuna Institute, recipient
February 2	Lima, Peru	Gerry Eijkemann, PAHO Alberto Arregui, Principal Investigator
February 5	Cerro de Pasco, Peru	Rosario Tapia R., Research technician Maria Angelica Chávez T., Research subject Santiago Malpaitida, Research subject Ricardo Guardián Chávez, Dean of the Faculty of Health Sciences, The University, UNDAC Medical Officer for Centromin Two miners, Centromin

February 8	La Paz, Bolivia	Guido Conadarco Aguilar, Principal Investigator M. Nasif Issa, former head of recipient institution, INSO
February 9	La Paz, Bolivia	Mario Pantoja, head of INSO Ariel Zárate Arancibia, National Director of Agriculture Carmen Rosa Serrano, Researcher
	Huatajata, Bolivia	Five Farmers, Research subjects
February 10	Bogotá, Colombia	Maria Elena Arroyave, Principal Investigator Pedro Vaca, Researcher
February 11	Carmen de Viboral, Colombia	Rodrigo Arenas, Member of Environment Committee (CORNARE) Javier Fox, Director of Hospital Juan Jairo Zuluaga, Medical doctor Oliva, Nurse
February 12	Carmen de Viboral, Colombia	Maria Mercedes Otalvaro, Agricultural Extension Officer (UMATA) Health promoters Farmer
February 13	Bogotá, Colombia	Jaime, Director of Laboratory, Epidemiology Section, Recipient Institution (INS) Marcella, Head of Research Team, Epidemiology Section, INS Director of INS

APPENDIX 6: List of publications resulting from projects (questionnaire and case study)

1. Amr MM. Health profile of workers chronically exposed to pesticides in two large-scale formulating plants. *Egypt J of Occ Medicine*. 1990;14:211-228.
2. Amr MM. Neurological effects of pesticides. *Egypt J of Occ Medicine*. 1991;15:205-22.
3. Amr MM. A cytogenic study on workers formulating pesticides. *Egypt J of Occ Medicine*. 1992;16:97-108.
4. Amr MM. Physiological and hystopathological studies on long-term inhalation of adult albino rats to pyrethroids. I. Serum glucose and insulin. *J Egypt Ger Soc Zool*. 1993;11:275-297.
5. Amr MM. Physiological studies on long-term inhalation of adult albino rats to pyrethroids. II. Serum lipidogram. *J Egypt Ger Soc Zool*. 1993;11:299-309.
6. Amr MM. Physiological and hystopathological studies on long-term inhalation of adult albino rats to pyrethroids. III. Serum protein, enzymes, creatinine and urea nitrogen. *J Egypt Ger Soc Zool*. 1993;11:311-334.
7. Amr MM. Neurological changes among workers in some chemical industries in Egypt. *Env Research*. 1993;63:295-300.
8. Amr MM. Health profile of workers chronically exposed to pesticides in two small-scale formulating plants. *Egypt J of Occ Med*. 1993;17.
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**INTERNATIONAL DEVELOPMENT RESEARCH CENTRE
Centre Internships Programme**

Name: Blair Rutherford

Theme Working Group/Evaluation Unit: Other (Health Sciences)

Supervisor: Gilles Forget

Topic of Work: Occupational Health and Safety

Dates of internship: from August 14 1995 to September 13 1996

1. Please append to this final report a technical report on the work you have accomplished during this internship. Please also account for any advances that you have received from IDRC.
2. Please restate your objectives for the internship.
 - a. Prepare a report evaluating Centre-funded projects on occupational health and safety;
 - b. Evaluate possible impact of Centre-funded projects on occupational health and safety on workers in developing countries; and,
 - c. Familiarize myself with the features of development projects on occupational health and safety.
 - d.

10. How could your internship experience at IDRC have been improved? Please elaborate.

The only down-side of my internship was that I began it before the restructuring at IDRC, which put me and my project somewhat on the sidelines of current priorities. Of course, this is a problem for which no one could be faulted and Gilles kindly included me in some of the activities of the Ecosystem Health PI, though my project did not directly fit into its mandate.

Unfortunately, the restructuring also perhaps affected the administration of the internship. At the start of my internship there was a small presentation by all the interns which was quite useful. It allowed the interns to get to know what others were doing. Moreover, it facilitated us to get together. Such activities, in my opinion, were lacking in the latter half of my internship.

11. Any other comments? (Please attach extra sheets if necessary)

Signature: _____

Date: September 16, 1996

Thank you for taking the time to give us your comments and suggestions. Your responses will help us improve the design of the Internships Program.

We would like to keep in touch with you! Please leave us a contact address for yourself.