

**Project Title: Actuarial Sciences Graduate Training Program (India-Waterloo)**

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**Synthesis:**

The objective of this project was to strengthen and enhance actuarial research and practice in India, through training of highly qualified actuarial candidates from India, and by providing support for a visiting faculty member from India, who would be able to take a lead role in developing actuarial research and teaching in the higher education sector in India.

The results have been mixed. The funds supported educational opportunities for three Indian students to participate in the world-renowned actuarial program at the University of Waterloo. Two of the three students performed very strongly, and have continued to further success in the actuarial field. The third student encountered some personal and academic problems, and is currently completing the program.

The two students who have completed their studies are currently working as actuarial analysts in Canada, while they complete their professional examinations. This is similar to a residency in medical education. Both students are planning to return to India once they have completed the actuarial credentialing process.

The funds allocated to supporting an academic visitor were not used. Despite many attempts to recruit a suitable candidate, we were not successful. A significant factor was that the visit was to be for a longer term, around 1-year, under the terms of the grant. However, there were no funds available for supporting visiting families, and, perhaps unsurprisingly, there were no young academics available and willing to spend such a long period separated from their families.

Overall, the funds were valuable in attracting and supporting strong Indian candidates to the professional Masters Actuarial Science program at Waterloo. Furthermore, having these students participating at the early stage made it easier for Waterloo to attract other Indian students subsequently, firstly because it enabled us to be more aware of the strong universities, and secondly because it helped other Indian students to be confident that this was a strong, suitable program for their needs.

**Background:**

Actuarial science provides the technical foundation for risk management in life insurance, health insurance, general (property and casualty) insurance and pensions. The actuarial profession worldwide has developed a curriculum which defines the actuary as, essentially, the engineer of insurance structures. Actuaries assess and manage the risks involved in insurance and pensions, through proper product design, pricing, development of underwriting standards, determination of asset management strategies, claims analysis, and enterprise risk management.

The actuarial profession in India was very strong historically. However, nationalisation of the life insurance industry in the 1950s, and the general insurance industry in the 1970s, reduced the

demand for actuaries, as the government, as insurer, could absorb the risks, without complex risk modelling and management. The actuarial profession in India dwindled in number. In the late 1990s, the government opened the markets in life and general insurance to private companies. The insurance sector in India soon became extremely active, with many new companies, most in joint venture structures, entered the market. A plethora of innovative products was introduced, and the simultaneous increase in the GDP meant that the demand for insurance rose accordingly.

Actuarial training in India follows the traditional UK design. Actuaries train 'on-the-job', by self study. Exams are rigorous and pass rates are low, despite the excellent standards in mathematical sciences of the actuarial trainees. Typically, qualification takes eight to ten years to complete. The situation is complicated by the lack of institutional actuarial knowledge; the self-studier in the UK generally works for a firm with many qualified actuaries at all levels of the management of the firm. This is an important resource in learning through self-study. The extremely small number of credentialed actuaries in India has the effect that almost all are in very senior positions, not available for supporting trainees' education. In fact, in many general insurance companies, there may be no full time credentialed actuaries on staff at all.

In many countries, the auto-didact approach to actuarial credentialing is being replaced by a combination of an academic credential, followed by work-based learning. This has been implemented in Australia, partially (and increasingly) in the UK, and is imminent in Canada. A major reason is the increasing technical complexity of the science of risk management makes the self-study route highly problematic. Complex, sophisticated risk management science is best learned in a formal education setting.

**The objective of this project:** The University of Waterloo developed an elite, fast-track program to fast-track high-quality mathematics and engineering graduates through the actuarial credential. This program, which leads to the degree Master of Actuarial Science (M.Act.Sc.), is designed to create a cohort of students into leadership roles in insurance. The program is not restricted to Indian candidates, but the Indian situation was a major factor in the design and implementation. In particular, the program is accredited by the UK Faculty and Institute of Actuaries, whose credential is recognised by the Indian Institute of Actuaries.

Through the M.Act.Sc., we aimed to credential around 5 candidates a year from India, at the level of Associate membership of the UK profession. From Associateship, the trainee must pass a further three practice-based examinations for the full, Fellowship credential. Currently, there are only around 250 actuaries in India, credentialed at Associateship or Fellowship level, who are also under 65 years old. We select very highly qualified candidates, and our education covers actuarial and business topics. These candidates are well-placed to return to India to enhance the risk management practice, with leading-edge training, and also to disseminate their education through the support of the local actuarial trainees.

Longer term, we aim to support the development of university actuarial programs that are high quality, rigorous, and are engaged in research and scholarship in the global academic actuarial community.

The two parts of the IDRC grant related to these two objectives. The first objective was supported through student scholarships for Indian students in the 2010 cohort of the M.Act.Sc. program. The second part of the IDRC grant, which was allocated to the support of a faculty visitor from a strong Indian university, was not utilised, due to a lack of suitably qualified candidates available to participate in the program.

### **Project Implementation:**

We identified and recruited three highly qualified M.Act.Sc. candidates from India, who were awarded financial support from the IDRC grant funds. The three grant recipients are:

A Chakrabarty	MSc, Indian Statistical Institute
K Desai	MSc, College of Science, Gujerat
N Khunteta	BSc, IIT Banaras

Mr Chakrabarty and Mr Khunteta graduated from the MActSc with excellent academic records. Both are currently completing their actuarial credentialing requirements in Canada, prior to returning to India to practice. Ms Desai is currently completing her academic requirements for the MActSc degree.

We have not been successful in identifying a partner institution willing to send a faculty member to Waterloo for a longer period of study. The older institutions, such as ISI, appear to be content to teach some actuarial science without further engagement in the discipline or the profession. We also approached several newer universities with interests in actuarial science. We modified the objectives slightly, with a few to a larger number of shorter faculty visits, but the small number of actuarial academic faculty in India, and the inability to provide familial support, were significant factors in the failure of this part of the project.

### **Project Outputs and Dissemination, Impact.**

This project is not a standard one for the IDRC program; there was no plan of research involved, and therefore no plan for disseminating the results of research. The sole use of funds was supporting the students named, and the ultimate impact depends on how successful these individuals are in promoting and developing the Indian actuarial profession.

### Overall Assessment and Recommendations

Clearly, this project falls outside the normal remit for IDRC funds. I believe that there has been significant value in creating a path for other strong Indian students to follow. We hope to see a critical mass of Waterloo alumni leading the way in developing strong actuarial risk management in the Indian insurance environment. It is too early to know whether we will succeed.