

Research: The saga of developing nations

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Researchers and scientist from developing and underdeveloped nations are important human resources who are responsible for improving the quality of life of countless people, populations, and communities through their pioneering, sincere and dedicated work. However, they have to work and conduct research under the most challenging conditions with minimal support, funding, infrastructure and empathy from the public.

Key words: developing nation, infrastructure, publication, research, science.

This article is a tribute to the monumental achievements and hard-earned success of scientists and researchers in spite of challenges to conduct research.

Some of the important challenges facing researchers and aspiring students in pursuing thier career and in publishing in top journals are presented below:

1) Poor infrastructure and laboratory facilities have been an important factor impacting quality work (Figure 1). Non-availability of quality analytical chemical reagents, sophisticated and precision instruments and equipments, up to date software necessary for analyzing and interpreting data generated, poor library facility and accessibility, extremely slow internet connections, frequent power disruptions, dismal conditions and poor maintenance of green houses and growth chambers, poor management and maintenance of records at research and academic institutions, progressively degenerating funding opportunities, reduction in the number of available laboratory assistants or trained technicians are a few of several compounding factors hamper-

ing progress and avenues to publish in quality journals.

- 2) Often simple protective gears and clothing necessary for conducting specific experiments are not easily accessible, affordable or available. Even simple and basic facilities such as microscopes, cameras, desktop computers or laptops, stable internet connections or facilities to conduct a comprehensive survey and interviewing, poor connectivity for commuting to distant fields, plots or survey localities are difficult to obtain making it extremely difficult (Figure 2).
- 3) The qualities of primary, secondary and tertiary level education have been severely impacted due to high student to teacher ratio. Therefore, the educational training and supervision necessary for training potential students is seriously compromised. The course and curricula in many institutions are not upgraded and revised regularly resulting in poor training of students to pursue higher education and choosing successful career path.

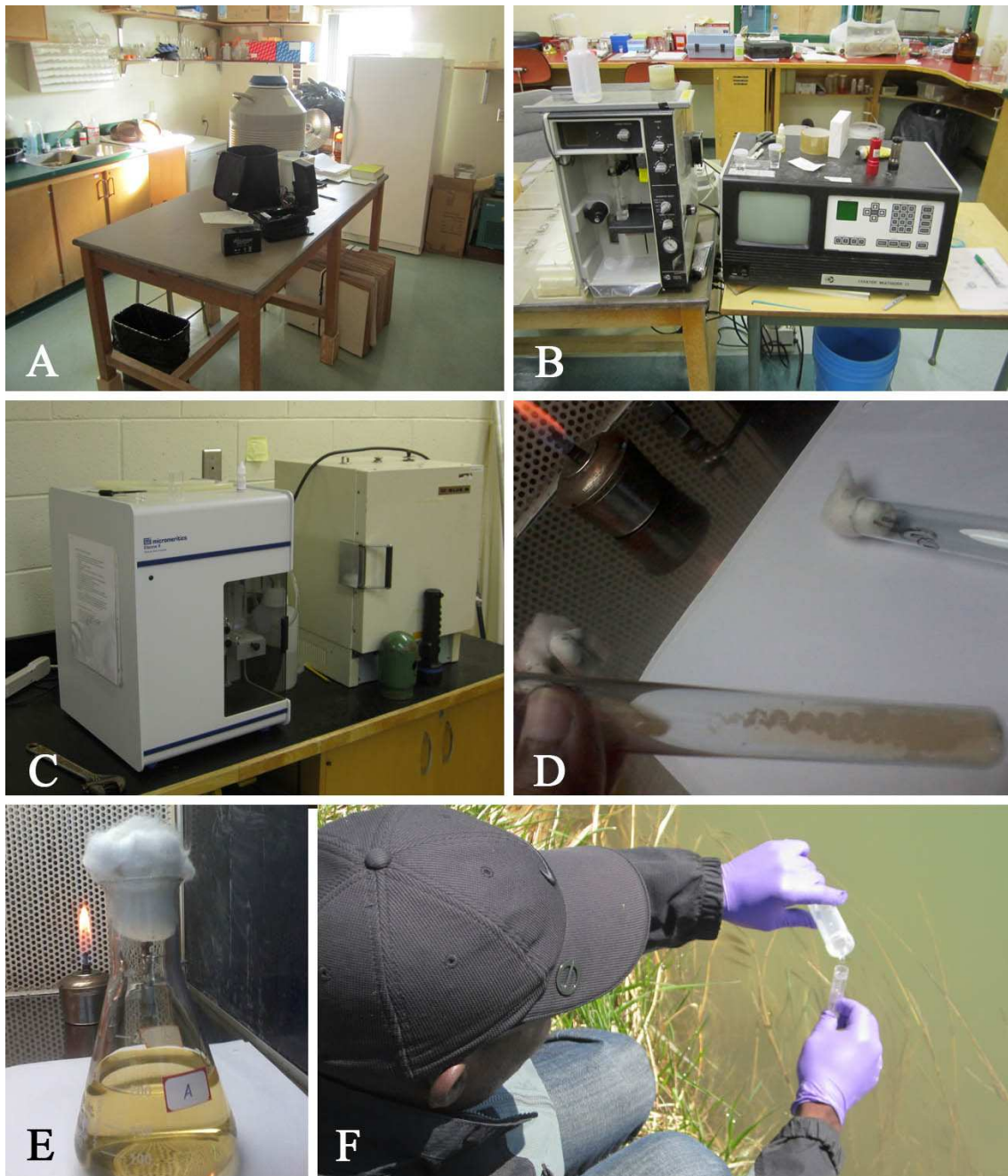


Figure 1. Comparison of infrastructure and facilities. **A.C.** Well-equipped laboratories from a developed nation. **D-F.** Minimal laboratory infrastructure and poor fieldwork conditions in an under developed nation (Photo credit: S. K. Basu).

4) Several members of the research fraternity come from a non-English speaking background. Hence, publications for them in quality English language journals become extremely chal-

lenging. The situation is further complicated by the non-availability of quality English language training at schools and universities in several such countries.



Figure 2. Infrastructure and connectivity issues. **A.** Lack of simple facilities like protective gears. **B-D.** Easy connectivity to commute to distant fields, plots or survey localities are important hindrances for conducting field work, surveys and in comprehensive data collection (Photo credits: A.S. Deshmukh. B-D. P. Zandi).

5) Due to the non-availability of affordable and easily accessible, quality, certified English language editing services in many nations; even potential convincingly good quality works do not

get the opportunity for submission in quality journals for peer review. Furthermore, the high expenses for publishing with reputed publication houses for several high impact journals across



different disciplines further limit the opportunity for publishing in top journals.

- 6) The poor quality of library facilities and accessibility is a serious concern. Since several institutes have poor library funding they could not afford high subscription charges. Unfortunately, the scientist and students do not have the access to several high impact journals and book volumes across different disciplines for enriching and upgrading their knowledge and for citing them in their articles.
- 7) Often scientists are being loaded with heavy administrative and non-research related duties and responsibilities due to an acute shortage and/or non-recruitment of support staff in running institutions efficiently. This critically reduces available time for quality work and impact their focus and enthusiasm for taking up interesting problems and

publication activities. Several such highly trained individuals are often engaged in preparing series of non-technical reports or in daily administrative management impacting their scientific initiatives significantly.

In spite of these challenges; academics; scientists and researchers have continued working with brilliance in different fields and are highly commendable. They are a continuous source of inspiration for the global research and academic fraternity who have never retracted themselves in facing multiple challenges to pursue their research activities. We sincerely hope that the situation will improve in near future and they will continue to inspire generations of aspiring science enthusiast across this planet for working with minimal infrastructure and support; and transforming the lives of millions of people through continuous progress and developments through their sacrifices, hard work, determination and dedication.

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