



## Pre-Amble

It all began with the international conference on *Ecosystem Conservation and Sustainable Development* held at Ambo University, Ethiopia, on February 10-12, 2011. By personal request of Prof. Pavanasam Natarajan, the Organizing Secretary, I ventured to give a one-day program on a special theme, *Animal Alternatives and Sustainable Development*, as a part of that conference. With all optimism I formed a team consisting of Dr Krishan K. Sharma from Maharshi Dayanand Saraswati University, Ajmer, India; Dr Surendra Ghaskadbi from Agharkar Research Institute, Pune, India; Dr Mukkara C. Sathyanarayana, Visiting Professor, Mahatma Gandhi-Doerenkamp Center, India; Dr Hossein Hosseinkhani from National Taiwan University of Science and Technology, Taiwan; and Dr Mardas Daneshian, CAAT-EU, University of Konstanz, Germany. The Doerenkamp-Zbinden Foundation (DZF), Switzerland, magnanimously supported the travel for all the speakers. Each one was to speak on a topic of his specialization pertaining to alternatives and their implications for environmental sustainability. It was a coincidence that Prof. Rallapalli Ramamurthi, Former Vice-Chancellor, *Sri Venkateswara University*, Tirupati, and former General President, Indian Science Congress Association, happened to be the Chairperson for this session. The presentations and the demonstrations enthralled the international audience, many of whom were hearing of Russell and Burch for the first time. Prof. Ramamurthi made a brilliant review and consolidation of all the talks. Later that day, Prof. Ramamurthi suggested that he would propose to the Indian Science Congress Association to host a special plenary session on “Alternatives” in the forthcoming Indian Science Congress (ISC) and indicated that I must organize it, which eventually happened. It was indeed a very pleasant surprise because the MGDC has been making steady progress towards dispensing with animal use in science pursuits in India, and this would be a forum where the issue could be addressed to the top-level scientific community – practitioners as well as policy makers.

Alternatives to animals in scientific pursuits has indeed become a subject of serious debate the world over, and even more so in India. This country, which was blessed with such divine leaders as Buddha and Mahaveer-, as well as social and political reformer Mahatma Gandhi, is historically aligned with “Ahimsa”, the philosophy of non-violence, not only to fellow human beings but to animal beings as well. This is adequately reflected in the *Constitution of the Country, which under Section 51A (G)* requires that “*It shall be the duty of every citizen of India to protect and improve the natural environment, including*

*forests, lakes, rivers, and wildlife, and to have compassion for all living creatures*”. *The Prevention of Cruelty to Animals Act 1960*, under Sec 17(d) requires that “*Experiments on animals are avoided wherever it is possible to do so; as for example, in medical schools, hospitals, colleges, and the like, if other teaching devices such as books, models, films, and the like, may equally suffice,*” and under Sec 17(f), “*As far as possible, experiments on animals are not performed merely for the purpose of acquiring manual skill.*” And yet, a country that should be a world leader in compassion towards animals has remained an animal user in teaching, testing, and research. The basic streams of science – life, medical, paramedical, and veterinary – rely on animals for research, testing, and education.

However, concern over biodiversity worldwide, advancement of information and communication technology, and demands by many animal rights organizations brought pressure for change. Questions were raised over the logic behind the widespread use of animals and the scientific fraternity’s tendency to rebuff the new tools. This could be due to two reasons. First, the academics and scientists were not sufficiently aware of the 3R principle and were not properly sensitized in this area. Second, they were not ready to quit the established and traditional practices and risk taking unfamiliar approaches. Against this background, many animal rights organizations, scientists, and ethical thinkers put forth efforts to educate these people and bring about change. Some sporadic endeavors were undertaken by PfA (People for Animals), I-CARE (International Center for Alternatives in Research, and Education), and PeTA-India (People for the Ethical Treatment of Animals), along with a few free-lance teachers and scientists. The scientists were sensitized but something was still missing, i.e., a lack of a concerted and directed effort.

The establishment of the Mahatma Gandhi-Doerenkamp Center (MGDC) for Alternatives to Use of Animals in Life Science Education at Bharathidasan University, Tiruchirappalli, Tamil Nadu, by the Doerenkamp-Zbinden Foundation, Switzerland, came as a panacea to resolve this issue. After its establishment in 2009, MGDC made strong alliances with organizations in India and abroad, conducted numerous seminars on the 3Rs and workshops on digital alternatives all over India, organized more than a dozen *in vitro* toxicology workshops, and participated in meetings at many educational and scientific bodies, such as the Indian Institute of Science, Bangalore; Indian National Science Academy, New Delhi; University Grants Commission, New Delhi; etc., during 2010-2012. The effort bore fruit, with the UGC passing guidelines on the discontinuation of animal use in laboratory exercises in colleges and universities. Although



animal use in education had been taken care of, drug testing, risk assessment, and research – the areas that consume the largest number of animals – still remained unattended to. The CPCSEA brought out strict guidelines, but they are not seriously respected, so animal experimentation continues, most of it with little in the way of ethical considerations. The scientists present at a recent one-day brain-storming session on the topic “Science, Animals, and Man,” convened by the Indian National Science Academy, New Delhi, emphasized that there is no science if drugs and potential toxicants are not tested in animals, within the purview of the CPCSEA Guidelines and the 3Rs principles. To them, however, “there are not many alternatives” to adopt. The Drug Controller General of India still makes animal testing mandatory, even in those cases where there are OECD-approved alternatives. Thus, the Indian Science Congress (ISC) is the most appropriate forum for sensitizing these stakeholders, since it is the forum that attracts the most media: This is where science policies evolve. Organizing a special plenary session on alternatives, by invitation, at the ISC provided a cherished opportunity for the MGDC, and the opportunity was gladly accepted.

The ISC-2012 was hosted jointly by the Kalinga Institute of Information Technology (KIIT) University and the National Institute of Science Education and Research (NISER), both from Bhubaneswar. The DZF was very generous in covering travel expenses for most of the speakers from abroad; the AP Sciences Inc, USA, met the travel expense for Dr Albert Li, and I-CARE, Italy, met the travel expenses for Dr Hosseinkhani. Prof. Ramamurthy convened the session, and I served as Chairperson. Dr Geetha Bali, General President of the ISC, was a key presence at the session, and she was very appreciative of the effort of MGDC. The talks by the ten speakers touched upon varied themes in the alternatives scenario, starting from the historical perspectives of animal use in teaching, testing, and research and moving on to the discovery of newer alternatives

and their validation. Thus, the science of alternatives was presented and discussed at the topmost scientific congregation in India, the ISC.

Again, it was the brainchild of Prof. Ramamurthy that this benefit not be limited to the 200-odd delegates present at this session but should also be available to all those who are engaged in the use of animals in scientific pursuits, not only in India but elsewhere, and so the articles will be published as Proceedings. The authors have kindly provided the articles and the DZF is sponsoring their publication in ALTEX Proceedings. The outcome of this joyful effort is now in the hands of the readers.

Immediately following the ISC the first-ever national workshop in India on “Computational Systems Biology and Dose Response Modeling” (CSBDRM) was conducted on March 2-4, 2012 at Bharathidasan University, Tiruchirappalli, by MGDC in academic partnership with The Hamner Institutes for Health Sciences, Research Triangle Park, NC, USA. The outcome of this workshop was so fascinating that it was decided to publish an elaborate academic report about this workshop. Since this workshop was a special Indian endeavor, it was decided that this report should also be included in these Proceedings of the ISC.



**Prof. Mohammad A. Akbarsha**  
Director & Chair, MGDC,  
Bharathidasan University,  
Tiruchirappalli, India