

depending on whether buses during that year carry 75% of motorized trips, and are large and fairly full (average load of 60 passengers), or if they only carry 40% of motorized trips and are smaller and/or emptier (35 passengers). Not only is an efficient public bus system important for meeting the mobility needs in this rapidly growing economy, but a higher share of bus transport would also reduce pollution, both local and global and energy demand.

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Pathetic story of an Indian technology developed for mosquito control

Mosquito-borne diseases have been major contributors to the sufferings and mortality of billions of people, especially in the underdeveloped and developing world. They have been rightly termed as neglected tropical diseases (NTDs). NTDs such as filariasis (elephantiasis) and leishmaniasis, inflict severe social stigma although they may not cause mortality. The battle of mankind with their insect carriers has been going on for decades with the invention of chemical insecticides. But, these arsenals became undesirable and ineffective due to the resistance developed by mosquitoes and concerns about their hazardous effects on man, animals and the environment. This calls for the search for alternate tools which are mosquitocidal, and safe to man and environment. The Vector Control Research Centre, Puducherry, a cell of the Indian Council of Medical Research, which is under the Ministry of Health and Family Welfare, Government of India, isolated an indigenous strain of a bacterium, *Bacillus thuringiensis* var. *israelensis*. This strain was found highly lethal to a variety of mosquitoes that transmit filariasis, malaria, dengue and other vector-borne diseases. The Pasteur Institute, Paris, a WHO collaborating centre for identifying and testing bioefficacy of biocontrol agents, rated this strain as the most toxic.

Over a period of two decades, the Centre worked on aspects such as bioefficacy against a variety of mosquitoes and safety to non-targets organisms, especially economically important insects such as honey bees and silk worms. The

bacterium was found highly effective in killing the aquatic stages of mosquitoes and not harmful to any other organisms, except mosquitoes. Scientists continued their efforts towards developing cost-effective production and formulation technologies. The agent was tested in several distant geographical areas with different geoclimatic conditions for its mosquitocidal efficacy, shelf-life, etc. and was found to be fit for an efficient mosquito control operation in those areas. Thus, an indigenous bio-friendly mosquito control agent was developed. Further, the efficacy of this agent was tested independently by other national and international agencies and certified to be highly effective.

Based on these facts a few Indian entrepreneurs came forward to commercialize this product and take it to the public. But, to their dismay, they lost their money. While they struggled to obtain the Central Insecticide Board (CIB) registration, their greatest block was the approval of their product by the National Vector Borne Diseases Control Programme (NVBDCP), another body under the Ministry of Health and Family Welfare. This organization has approved a product imported from Russia, and turned down the product developed by Indian scientists. The reasons given for not approving the indigenous product by NVBDCP have been changing during successive years at the meetings of the Technical Advisory Committee that came out with the recommendations leading to blocking of the indigenous product from marketing. It is to be noted that this product has

met all the requirements necessary for obtaining the clearance by the CIB, an apex body which gives approval for use of insecticides in the country. NVBDCP has been successfully blocking the sale of indigenous products because of reasons best known to the health officials of State and Central agencies, including the highest level of health authorities of the country. It appears that all this is to protect the interests of one firm, Biotech International Ltd, New Delhi. This company has been doggedly pursuing the prevention of not only indigenous products, but also other products of similar type, including those of multinational giants such as Sumitomo, let alone the small Indian investors.

It is thus one government organization with the responsibility of public health sabotaging the efforts of another government research organization committed to taking indigenous research to the health of the nation. If this is the fate of an indigenously developed technology by an institute of national importance, the fate of those technologies that are developed at lesser known institutions will end up on papers. When there is a lot of public outcry about public-funded research not reaching the common man, an indigenous product with immense use in combating NTDs is struggling to survive.

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