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Book Review

BIOSECURITY

P.K. Shetty, Ajay Parida, M.S. Swaminathan (Editors)

National Institute of Advanced Studies, Indian Institute of Science Campus Bangalore - India, M.S. SwaminathanResearch Foundation, Chennai – India, ISBN 81-87663-80-4, 2008, XII+255 pages

The range of diseases caused by biological agents and/or their toxins with the potential to be used intentionally against civilian populations is extensive and diverse. The advances in technology that have made diagnosis and treatment of many infectious diseases possible have also made it simpler to obtain, cultivate and use them for bioterrorism. The threat of biological agents being used for terrorism activity has given an impetus to research that will enhance humans' capability to detect, trace, and manage bioterrorism events.

Biosecurity needs a strategic and integrated approach that encompasses the policy and regulatory frameworks that analyze and manage risks in sectors of food safety, animal life, plant life and health, including associated environmental risk.

India is one of the countries most vulnerable to threats of bioterrorism. With growing concerns for the security of agriculture, environment and human health, in November 2006 the National Institute of Advanced Studies Bangalore and the MS Swaminathan Research Foundation, Chennai, jointly organized a discussion meeting on Setting up a National Agenda Towards Biosecurity, focused on issues related to biosecurity, biosafety, biohazards and bioterrorism and its relevance to India. The discussion included biosecurity specialists, policy makers and individuals from different organizations.

The book BIOSECURITY contains lead papers from the discussion meeting and also contributed papers in the biosecurity field.

The book has been prepared and edited in 17 chapters for being useful to medical students, healthcare providers, infection control practitioners, public health professionals and legal professionals involved in health policy issues.

Chapter 1 – *"Preparedness for Ensuring Biosecurity" (by MS Swaminathan)* presents an historical perspective on the development of biological weapons and an overview on the bacterial and viral agents of bioterrorism and biological and other toxins with potential for bioterrorism. The author thinks that India needs a National Biosecurity System, because of the linkages between human health and diseases like the mad cow disease in cattle. The National Biosecurity System should be capable of safeguarding the income and livelihood security of farm and fisher families as well as the food, health and trade security of the nation. There is also need for a National Agriculture Biosecurity Fund, because many times an urgent problem crops up. A biosecurity fund will help strengthen the infrastructure for sanitary and phyto-sanitary measures, upgrading facilities for plant, animal and fish quarantine and certification.

Chapter 2 – "*Plant Biosecurity in India*" (by R.K. Ketarpal and Kavita Gupta) presents important aspects like national plant quarantine set-up (legislation, infrastructure, risk associated with imports, interceptions in imported material, safe movement of transgenics), potential threat of biowarfare and even the need for a holistic strategy on biosecurity. Biosecurity will ensure only when there is an integrated approach to deal with its various components.

"*Biosecurity in Aquaculture" (by S. Ayyappan, W.S. Lakra, G. Rathore and A. Gopalakrishnan*) concluded that biosecurity can be applied to aquaculture production systems through a variety of management strategies and by following internationally agreed upon policies and guidelines. An important biosecurity measure is to develop an

effective quarantine system so as to avoid the introduction of exotic pathogens.

H. K. Pradhan presents in his chapter *Biosafety and Biosecurity* for Human and Animal Health, the biosafety levels described for laboratory dealing with microorganisms of risk groups I, II, III and IV.

In the next chapters – *Improving Food, Health and Nutrition Security in the Backdrop of Biosecurity* (by V. Prakash) and *Biological Warfare and Terrorism* (by D. Raghunath) are added some aspects on health and nutrition and on the biological warfare as a weapon of mass destruction to the agenda of biosecurity.

Chapter *Developing Options for Agricultural Biosecurity: Assessing progress and evaluating comprehensive mechanism* (by Panjab Singh) presents recommendations for the adoption of a comprehensive agricultural biosecurity system: promote policies and practices that increase free flow and open exchange of knowledge and information in the life science community; strengthen and enhance the scientific and technical expertise within and across the biosecurity communities; link scientists and NGO activist with the policy processes; ensure broader alliance among social and scientific communities, government, corporate and farmers; assemble all the stakeholders and communicate efficiently and honestly about the depth and seriousness of the issues; widen the picture on agricultural and food biosecurity and include the least privileged; promote organic agriculture and natural resources management.

In the chapter *Preparedness for Ensuring Biosecurity in the Biotechnology Sector* Renu Swarup established that with the expanding frontier of biotechnology, issues of biosecurity and biosafety are of paramount importance. Intellectual property rights, crop security, biodiversity and access to genetic resources, potential bioeconomic damage to the agriculture and livestock diversity and bioindustrial infrastructure are specific issues to concern. It is imperative that these issues be addressed globally and it is the responsibility of policy makers and scientists to adopt and promote policies which facilitate the process.

The next four chapters *Agroterrorism: Biosecurity threats and preparedness* (by P.K. Shetty), *Biosecurity in the National Context: Saving land, water and environment* (by S.M. Virmani), *Emerging Viruses: The Greatest Challenge to Biosecurity - A Historical perspective* (by B. Sesikeran) and *Biosecurity and Invasive Species – Management of the exotic weed* (by M. Mahadevappa) looks to the future and presents some case studies and ethical considerations which include respect for life and potential dangers.

The chapter *Initiative of FAO towards Ensuring Biosecurity* (by Gopi Ghosh) presents the efforts and measures that FAO supports for ensuring biosecurity such as: support capacity-building activities for developing countries including development of a capacity evaluation tools, and the coordination of sectoral initiatives. The FAO has been active in developing and farming international standards and guidelines, and agreements between various nations and partners. The FAO has played a stellar role in IPCC (for plant health), in OIE for the animal health issues, biosecurity in forestry specially in handle emerging issues such as alien invasive species and CODEX guidelines with who regarding the food safety issues (including GMO foods) and their standards, parameters, and testing methods.

A very interesting chapter is *Managing Natural Resources for Biosecurity* (by J.S. Samra and P.D. Sharma). The conservation, amelioration and sustainable management for natural resources, land, water, air, vegetation and climate is central to the meaning of biosecurity. It is vital to adopt appropriate natural resources management strategies for sustained productivity, environment protection and overall biosecurity such as: rehabilitating degraded lands; managing soil fertility; managing water resources; adopting Resource Conserving Technologies (RCTs), adopting integrated farming systems; mitigating contamination of soil- water-air-foods; mitigating impacts of climate change, mitigating trace element deficiencies and malnutrition.

The last chapter *The role of Biosecurity in Integrated Pest Management* (by T.P. Trivedi) include information on the surveillance, monitoring, quarantine measures, diagnostics, management of pests in agro-ecosystems and conservation of useful fauna and flora. These measures are needed to manage pest by utilizing knowledge resources in the changing scene of agriculture and horticulture. Efforts are for a multi-disciplinary team with the support of various stakeholders, to disseminate the knowledge of integrated pest management so as to conserve the useful fauna and flora and avoid the entry and buildup of harmful species in the multi-crop environment.

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