Preface

Vector-borne diseases have been major public health problems globally. Chikungunya, dengue, filariasis, Japanese encephalitis, malaria and visceral leishmaniasis are major vector-borne diseases prevalent in India. Recurrent outbreaks of dengue and dengue hemorrhagic fever, Japanese encephalitis, malaria, etc. in the country necessitated the need to use geographical information system (GIS) and remote sensing (RS) tools in vector-borne disease epidemiology and control. Recognizing the high potential of GIS and RS and their need, the Epidemiology and Communicable Diseases Division of the Indian Council of Medical Research, New Delhi initiated Task Force projects in malaria, filariasis and visceral leishmaniasis using GIS and RS applications in the year 2000. Projects in malaria were carried by the National Institute of Malaria Research (the then Malaria Research Centre), Delhi in collaboration with Haryana Space Application Centre (HARSAC), Hissar and Regional Remote Sensing Service Centre, Bengaluru; in filariasis by the Vector Control Research Centre, Puducherry in collaboration with Regional Remote Sensing Service Centre, Bengaluru; and in visceral leishmaniasis by the Rajendra Memorial Research Institute of Medical Sciences, Patna in collaboration with Regional Remote Sensing Service Centre, Kharagpur.

GIS is an information technology tool comprising computer hardware and software to input, store, update, retrieve, analyze and output geo-referenced data. In these projects, disease prevalence, risk factors responsible for the disease, vector distribution, environmental and climatic conditions relevant for vector prevalence, population characters, etc. were used as data inputs for GIS analysis. Remote Sensing was used to generate data on land use, water bodies, vegetation, forest cover, human habitation, etc., and these were also used as data bases in GIS analysis in the studies. Vector and disease prevalence predictions that came out of these studies were also verified by ground surveys. All the projects demonstrated the utility of these technologies in studying disease epidemiology, vector biology and distribution, in identifying environmental and other risk factors responsible for disease prevalence, development of decision making tools, etc. The outcome from these projects was conveyed to the National Vector Borne Disease Control Programme, Delhi for their use in planning and implementing control strategies.

Keeping in view the importance of these projects, we felt that a detailed account of these studies should be made easily available to a wider audience especially to researchers, disease control programme planners and implementers in the field. With this aim we have compiled the information reported in the final reports of the projects and also from the publications that emanated from these projects in this document. The document contains the following chapters: (1) Introduction: Information on vector-borne diseases scenario in India, potential of GIS and RS tools in vector-borne diseases and the projects carried out; (2) Malaria: Stratification of Mewat area in Haryana state to delineate malaria paradigms and to identify their receptivity and vulnerability to malaria; Identification of malaria receptivity in the Blocks/PHCs of Koraput district in Orissa state based on ecological profile and other attribute information; Identification of areas favourable for major malaria vector species; and Classification of villages in Tumkur district in Karnataka state as high, medium or low malaria risk based on land use features relevant for *Anopheles culicifacies* abundance; (3) Filariasis: Production of filariasis distribution maps for Tamil Nadu, Karnataka and Kerala states and for Puducherry;

Identification of risk factors in relation to the occurrence of the disease; Development of tools for decision making for the control of filariasis; and Validation of Geo-Environmental Risk Model (GERM) for predicting filariasis risk areas in Tamil Nadu state; (4) Visceral leishmaniasis: Identification of land use features that correlate with the vector species, *Phlebotomus argentipes* abundance in Vaishali district in Bihar state; (5) Future Prospects: Identification of studies keeping in view the vector-borne diseases control needs in India; and (6) List of Publications from the projects.

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