

- Operational research projects funded and scientifically supported by developed country partners should build upon local initiatives with existing stakeholders and advocates
- All mosquito species must be targeted to reduce nuisance biting and maintain community support. Need to meet community expectations based on their perceptions of impact to whom the relationship between malaria, mosquito species and habitats is usually poorly understood in local communities, often more motivated by mosquito biting nuisance than malaria or any other pathogens they transmit
- A key challenge for mosquito control programmes focusing on larviciding in urban areas is to have full, regular access to all open spaces potential for accommodating aquatic habitats where mosquito proliferation takes place, including all fenced plots and other areas with restricted access for the public. This requires substantive and open collaboration between stakeholders and residents.
- Community involvement in both the recruitment process of the individuals and implementation of the intervention is therefore essential to programme performance.
- Wide-scale community-based implementation can be effectively achieved through a decentralized vertical management structure, utilizing the hierarchical gradient of implementation strategies and partner roles across all the necessary spatial scales. Such centralized coordination is essential to enable institutionalization of strengthened management and planning, improved community mobilization capability, and capacity to exploit national and international funding systems.
- Effective mechanisms for communication and feedback of monitoring data within days, weeks or months rather than years are essential for LSM of mosquitoes that can develop from egg to adult within a week.
- LSM requires continuous and thorough monitoring because success and failure occurs on remarkably fine spatial ($< 1\text{km}^2$) and temporal scales (≤ 1 week) that match to the retreatment cycles and geographic division of responsibility to individual staff.
- While surveillance of larval mosquito populations to assess the effectiveness of larvicide application, and the performance of individual personnel are essential internal monitoring functions, external quality assurance of these activities, as well as monitoring and evaluation of impact on adult mosquitoes and malaria risk should be separately conducted by an institutionally independent partners reporting directly to the programme management to avoid conflicts of interest that inevitably arise from self-assessment.
- Proven systems for rigorous and timely monitoring of LSM remain to be fully developed and take many years to slowly evolve to address the high standards required to ensure rapid identification of implementation failures at sufficiently fine spatial and temporal scales. For example, the decentralized, community-based use of a mosquito trap, which had to be specifically designed and optimized to address the local needs of the UMCP, took 7 years to develop and evaluate.
- LSM programmes should start small on manageable pilot scales and then progressively build and institutionalize their capacity and experience. Training and developments costs should be included in budgets that are strategically planned and consistently supported over the long-term so that locally-adapted LSM programmes and their supporting institutions have sufficient time to learn, consolidate and stabilize.
- Such pilot programmes should follow clear, prospectively designed, institutionalization plans that unambiguously delineate who will do what, at what spatial scale, and how the multiple independent institutions that are required will interact. Ambiguities regarding institutional roles and responsibilities inevitably results in i) competition between the technical and oversight partners, ii) politicization of the technical partners at the expense of doing their day-to-day technical work, and iii) a disconnect with the partners in other sectors, especially the local government.
- Channeling funding for all necessary implementation, monitoring, evaluation and operational research activities through a single, shared administrative mechanisms inevitably results in unhealthy competition for budget priority between the partners responsible for these distinct functions. Each partner institute should administer its own distinct, pre-agreed, ring-fenced budget in a manner that prevents conflicts of interest, such as compromising the independence of external monitoring, evaluation and operational research activities by making the responsible partners contractually dependent upon the implementation partners they are obliged to assess objectively.
- Because effectiveness of LSM programmes relies upon monitoring and managing at very fine spatial and temporal scales, the ability to collate, synthesize and report simple but reliable monitoring data in the shortest time possible are essential. Furthermore, maintaining and managing a stable funding base, as well as an effective collaboration between the partner institutions responsible for the diverse and distinct functions of an LSM programme are paramount to long-term success. In most lower-income countries, capacity to manage logistics, human resources, institutional partnerships and funding support are most limiting, far more so at this juncture than technical entomology skills.