Monitoring of rainwater harvesting system vital to avoid proliferation of mosquito vectors

Everyone welcomes the 'world's largest rainwater harvesting project in Karnataka' in view of enrichment of the groundwater table to meet the people's daily requirement of domestic water. With clear pictorial designs Shiva Kumar[1] makes the reader easily understand the importance of rainwater harvesting structures (RWHS). The implementation part is well planned in several schools in different districts of the state[1]. However, the subsequent maintenance of the structures needs to be given top priority in order to avoid the proliferation of dreadful disease-transmitting vector mosquitoes. In this connection, a study carried out is presented here to monitor RWHS.

Recently, at Cuddalore town, Tamil Nadu, where RWHS has been implemented and is mandatory for all buildings, the contribution of vector proliferation by defective harvesting structures has been studied[2]. Though the 'Groundwater Regulation Act–2003', has laid down standard specifications for construction of RWHS, deviations are made by people depending on affordability and availability of space[3].

In general, a RWHS consists of a rainwater collection site (a rooftop, either RCC terrace, tiled roof or thatched roof), a conveyance structure, i.e. a gutter or a tube (made of cement, tin sheet or earthen pipe) and a collection tank, which is either a pit, a well, a soakage pit, a storage tank or a bore-well for recharge of groundwater. During the study it was observed the most common faults (% shown in parentheses) that led to water stagnation and supported profuse mosquito breeding were the following:

(i) Inadequate filling material in percolation pits/tanks affecting soak away of rainwater (23.91%).

(ii) Obstruction of roof-gutter with garbage in tiled houses (9.44%).

(iii) Cracks on sidewalls of percolation pits facilitating entry of ovipositing female mosquitoes (9.42%).

(iv) Blockage of conveyance pipes by garbage, preventing water flow and leading to stagnation in terrace (8.55%).

(v) Obstruction of PVC pipes linked to wells with debris (1.87%) resulting in stagnation.

(vi) Other defects observed were damages to conveyance structure (36.77%) leading to leakage of either rainwater into street drains or seepage of sullage water into the RWHS.

(vii) In huts, open plastic/iron drums used for harvesting rainwater (2.32%) promoted mosquito proliferation.

(viii) RWHS with neither conveyance pipe (4.31%) nor percolation pit (3.41%).

The different vector species obtained from the RWHS through pupal emergence include *Aedes* (*Stegomyia*) *aegypti* (Linnaeus) and *Ae.* (*Stegomyia*) *albopictus* (Skuse) (vectors of dengue and chikungunya), *Anopheles stephensi* Liston (vector of malaria), *Culex quinquefasciatus* Say (vector of Bancroftian filariasis), and *Cx. tritaeniorhynchus* (vector of Japanese B encephalitis).

Therefore, attention on the maintenance of RWHS needs to be ensured through IEC (information, education and communication) to various sectors of the people. Periodic monitoring on the RWHS implemented at different places is a prerequisite in order to avoid the defects caused due to natural disasters such as high speed wind, destruction of structures by heavy rain, etc. Thereby, the system could be made effectively functional during the monsoon period.

1. Shiva Kumar, A. R., *Curr. Sci.*, 2007, **92**, 161–163.
2. Mariappan, T., Srinivasan, R. and Jambulingam, P., Final Report of document by Vector Control Research Centre, 2006, 1–19.
3. Anon., Government of Tamil Nadu Municipal Laws Ordinance: Groundwater Regulation Act–2003, 2004.

T. MARIAPPAN

Vector Control Research Centre, Medical Complex, Indira Nagar, Puducherry 605 006, India
e-mail: tmappan@gmail.com

Moral responsibility of geoscientific community

Geoscientists work for the cause of mapping georesources, device ways and means to beneficiate them and on the ways to extract them for the economic benefit and welfare of human community. With the advent of liberalization of economy and provision of single-window mining, licensing policies in developing countries, including India, increasingly newer mines are being opened up, exhausting the mineral resources for betterment of quality of life.

With this paradigm shift from government-controlled nature of major mining projects to private participation, many newer mines are being opened up, that provide copious jobs to the needy and rural poor. While all can appreciate these employment opportunities, it involves few technical jobs and much non-technical/physical labour from unorganized sector. Typically, this employment results in shift of agricultural and rural people into mining projects. When energy requirements for agricultural and mining work are compared, it appears that the mine-workers are underpaid for their energy expenditure. In addition, there is a lacuna on a baseline data pertaining to their energy and remuneration requirements.

The 'energy need' of physical activity is an important factor, which determines the quantum of energy required to perform a particular task. Defined in terms of calories, the energy need, varies with reference to type of physical activity, gender, physiology and health of body and age. Average calorie requirement for light, moderate and heavy activities are 225, 375 and 525 calories per hour respectively, for an adult man. If the physical activity is not matched with that of