



Ministry of Health & Family Welfare
Government of India



India fights dengue

Strategy and plan of action for
effective community participation
for prevention and control of dengue



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जगत प्रकाश नड्डा
Jagat Prakash Nadda



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भारत सरकार
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Message

The role of Community in prevention and control of Dengue through involvement in source reduction activities is significant in current scenario in the absence of specific drug and vaccine. The commitment of people from different walks of life for prevention and control of Dengue is essential. Concerted effort is needed for prevention of Dengue, being a complex neglected tropical disease.

2 Implementation of community-based comprehensive programmes, which draw on local institutions and understandings of community, enable the community members to participate in the planning and management of prevention and control activities. These can result in sustainable behavioral impact to prevent and control of dengue in the Country. Hence, the role at various levels in community is emphasised at appropriate places in this strategic document. Hope that the Strategic Plan Document for Effective Community Participation for Prevention and Control of Dengue will support the States to plan the activities for effective social mobilisation and community participation.

(Jagat Prakash Nadda)

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Department of Health and Family Welfare
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MESSAGE

Dengue has become one of the major public health challenges of the present time. The risk of dengue has increased many fold in recent years. The geographical spread of dengue with intense outbreaks has been observed. The disease is prevalent across the country and cases are reported from both urban and rural areas. As the dengue vector mosquito bites during day time, the risk of transmission at work place, schools, hospitals etc. is critical. Success of dengue control programme is directly related to community participation and ownership. Behavior of a person cannot be changed in a day, we have to ensure changing of mindset of the community and to motivate for ownership of the programme activities. Involvement of household, community for vector control is of paramount importance as the problem revolves mainly around man and his environment. Dengue prevention and control necessitates an effective intersectoral approach, requiring close collaboration and partnerships between the health and non-health sectors.

This document is framed at the moment when community support is critical to stop the chain of dengue transmission and aimed to promote awareness on the prevention and control of dengue. I personally feel that Community should be involved after empowering with the knowledge about mode of transmission, vector control options, availability of services in addition to correct treatment, so that timely and appropriate action is taken. School children can be sensitized and involved as brand ambassadors, I am sure that by joining our hands together we can protect our community from dengue.


(C. K. Mishra)

Dr. Jagdish Prasad
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दिनांक/Dated.....

MESSAGE

Dengue became a major public health concern in India, effecting both urban and rural areas. Out of various measures for prevention and control of Dengue, Community participation is a household word for the health workers involved. Although it is emphasized at all levels but still there was a need to make it effective community participation by involving all stakeholders with inter-sectoral coordination and community ownership for programme activities. In recent studies, it is revealed that sustainable process of encouraging community members to eliminate the vector breeding sites is vital to lead to a decrease in dengue burden. In absence of effective drug and vaccine for dengue, vector control is the only measure to minimize the risk.

In view of above, the strategy document for effective Community Participation and implement community-based programmes encouraging the role of community and non-health partners in preventing mosquito-genic conditions in Indian context was felt as a need of hour. This document would also be crucial for preventing *Aedes* borne viral diseases like Chikungunya and ZIKA. The Government of India prepared this document after a series of discussions at different fora incorporating the views of National and International experts. I hope, this document will be beneficial for Health personnel, community and other concerned departments and will prove a tool to make a dent in country's dengue burden.

(Dr. Jagdish Prasad)

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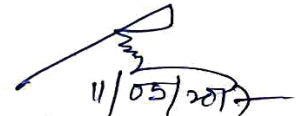
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Director

Dated: 11th May, 2017

FOREWORD

Dengue is a public health concern in India. All the States and Union Territories are endemic in the country. In absence of specific antiviral treatment against dengue, community participation is crucial for sustained Dengue prevention and control. The partnership with community members in programme activities necessitates for creating appropriate responses to the community needs. The implementation of community-based programmes can result in sustainable behavioural impact to prevent and control dengue in the country.

This strategic document has been developed to support the States to plan for community sensitization and effective participation. The various sections of this document viz., Strategy for effective community participation, Plan of action, Roll out plan and Monitoring and evaluation plan will help and guide the States to draw action plans for community participation to reduce occurrence of dengue.


11/05/2017
Dr. P.K. Sen



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Dr Kalpana Baruah
Joint Director

Dated: 11th May 2017

PREFACE

Dengue has emerged as fastest spreading vector borne disease in India during last few decades. For its prevention and control, the National strategy is based on the field experiences, scientific studies and views of National and International experts. As the drug and vaccine for Dengue are not available at present, vector control is the key strategy, for which community involvement is crucial. Community efforts in right direction can minimize the disease burden in the country. Success of the Dengue control programme is related to community participation and ownership. Effective dengue control is not possible if control efforts are limited to one state or a few states. It requires the adoption of an approach through collaboration among states, municipalities and sustained partnerships with other intersectoral partners to enable implementation of evidence-based interventions and the use of best practices.

Community participation is a principle by which one has to plan, implement, monitor, and evaluate dengue prevention and control, this resource addresses all these components. This strategy document is framed for making community participation more effective and to push the community ownership. The document deals with Dengue vector habitats and suggestive actions by community in various eco-epidemiological settings, brief account on actions and target group based community Sensitization etc. for mutual relationship with community members, stakeholders for involving them in programme activities.

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The Strategy and Action plan for Effective Community Participation for prevention and control of Dengue is framed for making community participation more effective emphasizing community ownership for Dengue control activities.

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INTRODUCTION

Acknowledging the importance of community participation in health, envisage a longer-term, more sustainable and equitable vision of partnership with communities, using proven community mobilization approaches that produce impressive health results by building greater community participation, commitment and capacity.

Community participation and empowerment is one of the most important elements of the Integrated Vector Management (IVM) strategy. It allows the local population, who most suffers by the consequences of dengue, to drive effective prevention of the disease. Since no specific antiviral treatment or vaccine against dengue is available, modification of individual behaviour is essential in mosquito-control initiatives. This means that individual households must accept responsibility for the control of mosquitoes in their surroundings. Vertical vector control programmes may be ineffective if communities are not active partners in the control actions.

A successful, sustainable vector control programme must involve a strong partnership between the government and community. Public participation is necessary at various stages in the local vector control strategy: in assessing the community's problems and needs, in planning and implementing activities and in monitoring and evaluation. To further strengthen the aspect of community participation in dengue control in India, this document has been drawn up to support States to implement community-based programmes that can result in sustainable behavioural impact to address the problem of dengue in India. It comprises of four main sections:

- 1) Strategy document
- 2) Plan of action
- 3) Roll out plan and
- 4) Monitoring and evaluation plan

This can be adopted by different States depending on their contexts to ensure effective community participation for prevention and control of dengue. Effective community participation can convince people to adopt and maintain behaviours that will prevent *Ae. aegypti* breeding in and around their homes, ensure personal protection against dengue and timely and proper treatment seeking in case of fever.

Controlling dengue is everyone's responsibility. Contributing towards a vision of 'Dengue free India' increased community ownership can help prevent dengue transmission and reduce dengue related morbidity and mortality in India. This will also provide collateral benefit for other *Aedes* vector transmitted diseases like Chikungunya, Yellow Fever and ZIKA, though the latter two are not reported from in India till date.

STRATEGY FOR EFFECTIVE COMMUNITY PARTICIPATION FOR PREVENTION AND CONTROL OF DENGUE

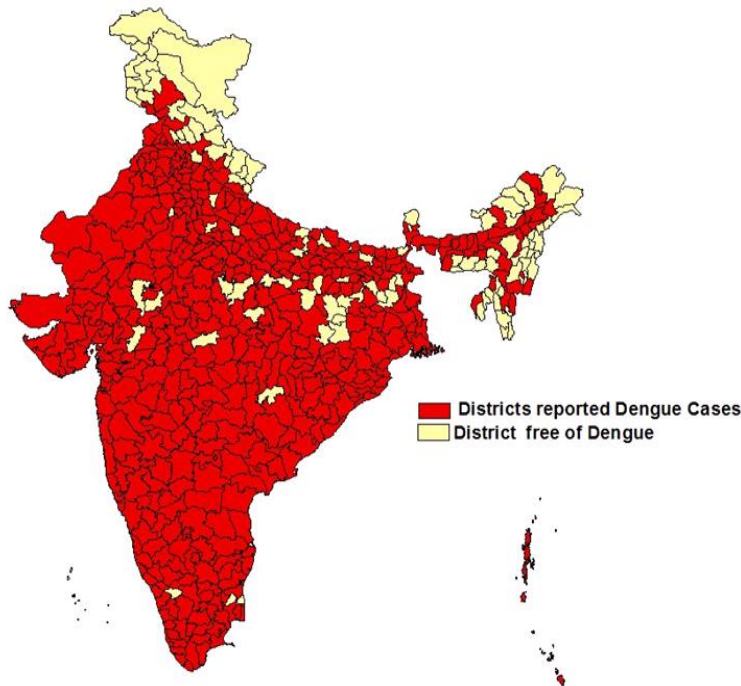
This strategy document has been drawn up to support States to strategize for effective community participation and implement community-based programmes that can result in sustainable behavioural impact to prevent and control dengue in India. The States will be drawing up their context specific action plans for community participation based on this strategic guidance.

Dengue: In recent years, mosquito-borne diseases have emerged as a serious public health threat. Dengue is one of them, which is a self-limiting acute mosquito transmitted disease and is characterized by fever, headache, muscle & joint pain, rashes, nausea and vomiting. Dengue is a viral disease and spread by *Aedes* mosquitoes. Some infections result in Dengue Haemorrhagic Fever (DHF) and in its severe form Dengue can threaten the patient's life. Dengue virus has four serotypes. Dengue fever can be caused by any one of these four serotypes. Infection with one dengue serotype gives lifelong immunity to that particular serotype, but there is no cross-protection for other serotypes. Persons who were previously infected with one or more types of Dengue virus are assumed to be at higher risk for developing severity and complications, if infected again. The clinical presentation depends on age, immune status of the host and the virus strain.

Global situation: The global distribution of Dengue Fever (DF) is comparable to that of malaria, and an estimated 2.5 billion people live in areas at risk for transmission. Each year, there are an estimated 50–100 million cases of DF and depending on the year, 0.25-0.5 million cases of DF require hospitalization. Of the latter, 90% are children under the age of 15 years. The case-fatality rate varies by country and most fatal cases are among children and young adults. DHF mortality rates average 5%, with approximately 25,000 deaths each year. While dengue was formerly thought to be strictly an urban problem, it is now occurring in rural areas of South-East Asia as well. The cumulative dengue disease burden has attained an unprecedented proportion in recent times with sharp increase in the size of human population at risk.

Dengue in India: The resurgence of dengue poses a major challenge as all the four serotypes of dengue have been reported from various parts of India. The resurgence of DF in the country can be attributed to rapid development and economic expansion which not only led to urbanization but also increased movement of people between cities and states. Between 2006-2008, 18 States and Union Territories (UTs) reported dengue cases. The number increased to 20 and 29 during 2009 and 2010 respectively. Now Dengue is endemic in all States and UTs of India. During 2015, a total of 99,913 dengue cases and 220 deaths were reported from 35 States/ Union Territories (UTs).

Dengue affected areas since 1991



Over the years, not only the number of cases are increasing, the disease is also spreading to newer areas. Recurring outbreaks of dengue have been reported from Andhra Pradesh, Delhi, Goa, Haryana, Gujarat, Karnataka, Kerala, Maharashtra, Rajasthan, Uttar Pradesh, Odisha, Puducherry, Punjab, Tamil Nadu and West Bengal. Also, outbreaks were reported from some North-Eastern states like Assam and Arunachal Pradesh. Cases are being reported from rural areas as well. The National Health Policy (Draft 2015 at SI no 4.3.7.6) notes that Dengue is emerging as the fastest growing infection globally and India too faces a challenge.

Factors contributing to the spread of Dengue in India: Risk of dengue and geographical spread of Dengue has shown an increase in recent years due to various factors in urban, peri-urban and rural areas, leading to proliferation of mosquito breeding sites. These include: rapid and unplanned urbanization; population growth; increasing inadequate municipal services; increased use of non-biodegradable products (bottles, plastic, cans, tyres etc.); and an unprecedented growth in the population movement and commodities via travel and commerce, all amid largely ineffective mosquito control efforts in many districts and municipalities. In addition to these, non-cognizance of the factor that effective long-term control of dengue depends upon sustainable and integrated community based action also added to the problem manifold.



In India, *Ae. aegypti* is the main vector in most urban areas; however, *Ae. albopictus* is also found as vector in few areas of Southern and Eastern India. The *Ae. aegypti* mosquito

breeds mostly in man-made containers, whereas, *Ae. albopictus* breeds mainly in natural larval habitats like tree holes, leaf axils and coconut shells etc. Unlike other mosquitoes, it is a daytime feeder; its peak biting activity is in the morning and in the evening before dusk. The population of *Ae. aegypti* fluctuates with rainfall and humidity. Under optimal conditions the life cycle of aquatic stage of the *Ae. aegypti* - the time taken from hatching to adult emergence is seven days in optimal condition (temperature $25\pm 5^{\circ}\text{C}$ and relative humidity 70-80%). At low temperatures, however, it may take longer time for adults to emerge. Female *Aedes* mosquito transmits the disease while biting human being for the blood protein needed for development of eggs. Males survive on nectar. Males survive for a week. Maximum survival of female *Ae. aegypti* and *Ae. albopictus* is about four weeks. During the rainy season, when survival is longer, the risk of virus transmission is greater.. *Aedes* has a limited flight range of 400 meters.

The rural spread of *Aedes* is associated with expanding network of rural water supply schemes and other development projects without health impact assessments, scarcity of water with consequent water storage, changing lifestyle with rampant use of desert coolers and indiscriminate use of disposable containers, bottles, etc. improved transport system and population movement.

Prevention and control of Dengue:

No specific antiviral treatment or vaccine against dengue is available.

The key options for preventing and controlling Dengue are:

- a) To control larval habitats in and around people's homes, workplaces, unclaimed empty spaces, dump sites and public areas such as place of worships/recreational centers, roadsides, playgrounds, and cemeteries
- b) To reduce human–vector contact
- c) To ensure prompt diagnosis of cases of fever and appropriate clinical management

***Aedes* Control Methods:** A range of *Aedes* control methods now exist, many of which have been tried and proven for different situations in different countries.

- Environmental sanitation measures to reduce mosquito breeding sites (source reduction), such as physical management of water containers (e.g. mosquito-proof covers for water storage containers, polystyrene beads in water tanks), better designed and reliable water supplies, and recycling of solid waste such as discarded tyres, bottles, and cans.
- Biological methods (e.g. fish, Copepods – small crustaceans, cyclops that feed on mosquito larvae) to kill or reduce larval mosquito populations in large water containers.
- Chemical methods against the mosquito's aquatic stages for use in larger water containers (e.g. larvicide- Temephos, insect growth regulator – Pyriproxyfen, diflubenzuron).
- Chemical methods directed against adult mosquitoes, such as insecticide space sprays.
- Personal protection through use of repellents, vaporizers, mosquito coils, and insecticide-treated screens, curtains, bednets (for daytime use against *Aedes*) and

fully covered dress Of the above source reduction was found to be most effective globally

Challenges in *Aedes* Control: Though a range of *Aedes* control methods exists, however, many States continue outdoor space spraying (fogging) of insecticide for adult mosquito control as the strategy for Dengue control. This is costly and its effectiveness is limited. *Ae. aegypti* prefers to rest inside houses, so vehicle mounted or outdoor fogging simply does not reach mosquitoes resting in hidden places. Home-owners in various places may refuse entry to spray teams for indoor space spraying, or shut windows and doors to prevent outdoor insecticidal fogs from entering their house, thus reducing the impact of this intervention. Furthermore, delay in reporting or incomplete line-listings have made spraying often too late to prevent epidemic and adult mosquito populations quickly return after spraying. Indoor space spray is thus more effective than outdoor fogging. Larval control is also challenged as the eggs can remain dormant for more than a year in dry condition and once they come in contact of water, desiccated eggs hatch and larvae emerge. There is also evidence of vertical transmission of dengue virus from infected female mosquitoes to the next generation. Public trust and complacency in such an ineffective approach has only increased the challenge of explaining the need for community involvement in the control of larval habitats.

Insecticide fogging is not recommended as a routine measure for control of *Aedes* mosquito.

Need for community participation for sustainable Dengue prevention and control: In modern time, two countries - Cuba and Singapore, which have been successful in controlling *Ae. aegypti* have used a combination “top down–bottom up” approach. Unfortunately, the “top down” methods used in the past are no longer feasible because of lack of resources. Moreover, the vertically structured programmes of the past had little sustainability which can only come through community participation in mosquito control programmes. In order to achieve sustainability of a successful DFHE vector control programme, it is essential to focus on larval source reduction and to have complete cooperation of community groups, to ensure community understanding and involvement in implementation. In most of the Indian States, the aspect of community participation in dengue control needs to be strengthened further.

Community participation and the National Health Policy: The National Health Policy (Draft 2015) under its Policy Directions for preventive and promotive health for addressing the wider social and environmental determinants of health refers to the importance of community participation in health. It states that ‘Other than its own policy action and initiatives, the Government has an obligation to build community support and capacity to enjoy

Controlling Dengue is everyone’s responsibility

Vertical vector control programmes may be ineffective if communities are not active partners in the control actions but rather are passive participants or recipients of the control efforts.

People need to assume responsibility for inspection and control of *Ae. aegypti* in and around their homes.

Successful, sustainable *Ae. aegypti* control programme must involve a partnership between government agencies and the community.

good health, particularly among those who are most vulnerable and have the least capacity to make choices and changes in their lifestyle or living conditions that might improve and protect their health.’ The Village Health Sanitation and Nutrition Committees (VHSNCs) and their urban equivalents that are a part of Local Government Institutions are a platform that must be strengthened and utilized for this purpose.

Community participation as part of the Global vector control strategy and the National Guidelines for Integrated Vector Management: Many countries including India have adopted the global strategy of vector control and incorporated it into its programme. The global strategy for operationalization of *Aedes* vector control has *selective integrated mosquito control with community and inter-sectoral participation* as one of the five major components.

- Selective integrated mosquito control with community and inter-sectoral participation
- Disease surveillance based on a strong health information system
- Emergency preparedness
- Capacity building and training
- Research on vector control

The Guidelines of the NVBDCP, Mid Term Plan for Prevention and Control of Dengue and Chikungunya and Integrated Vector Management for Control of Dengue recommends adoption of a comprehensive approach by way of regular vector surveillance and integrated management of the *Aedes* mosquitoes through biological and chemical control that are safe, cost effective; environmental management, legislations as well as action at household and community levels are identified as imperative.

Understanding community participation: An essential understanding is that effective community participation in health entails a side-by-side involvement of community members with health care professionals and a responsible sharing of both power and responsibility. *Community participation (CP) has been defined “as a process whereby individuals, families and communities are involved in the planning and conduct of local vector control activities so as to ensure that the programme meets the local needs and priorities of the people who live in the community, and promotes community’s self-reliance in respect to development.”*(WHO).

Address not just households but the broader community: Vector control cannot be very effective if carried out only on individual basis. Even those who do follow the recommended actions may still have *Ae. aegypti* or other mosquitoes in their houses and worse still, may suffer dengue infections if their neighbours do not participate in controlling domestic breeding sites, or they may get bitten by an infected mosquito at their place of work, study etc. Therefore, the issue for vector control is not whether source reduction is effective, but whether and how community participation can be a part of that source reduction effort.

Thus, multi-level, vertically and horizontally integrated programmes offer the best solution to dengue control. For optimal effect, programmes need to include not only behaviour change efforts at the household level, but target the broader community groups including schools, work sites and other organizations within the community. There is need to adopt an expansive view of the “community” as a set of programme partners, which may include

householders, local leaders, commercial business owners, opinion leaders, schools, environmentalists, resident associations, Community Based Organizations (CBOs), Faith Based Organizations (FBOs), Inter-Departmental partners etc.

Guiding Principles of Community Participation: Success of the Dengue control programme will depend on effective and sustainable integrated community based long-term *Aedes* control strategies as most of the transmission occurs at home. Thus, community participation is a principle by which to plan, implement, monitor, and evaluate dengue prevention and control. It is important to work in partnership with community members in all phases of the programme to create locally appropriate responses to health needs. Here are some guiding principles/points to consider when planning, implementing and monitoring community participation in dengue prevention and control.

- **Identify the needs** of the community instead of imposing what the programme has to offer.
- **Conquer trust:** Those who would carry out the activities should understand the problem and need of the community. Allow them to express their views, be a good listener. Adapt the programme activities according to the social-cultural norms of the target community. Motivate them about the expected benefits.
- **Build ownership:** Those who must implement the plan need to have ownership of its content. The process of working together to develop a plan has significant effects on group cohesion and mutual respect.
- **Support creative potential:** Identify and support the creative potential of communities to develop a variety of strategies and approaches to prevent and control dengue and improve health status.
- **Recognize diversity and equity:** Promote community members' participation in ways that recognize diversity and equity.
- **Ensure interpersonal or face-to-face communication:** Increasing evidence suggests that many cultural groups prefer interpersonal or face-to-face communication supported by IEC material. Face-to-face communication has also been shown to be crucial for sustaining behavioural results once awareness and knowledge levels have been raised through mass communication.
- **Be flexible:** Flexibility will have to be at the core of community interventions. There might be times/seasons when people are not available during the day because of work or other pre-occupations. Then activities might need to be carried out in the evenings. Each community has very different needs and interventions need to be tailored accordingly. Further, there should be a realistic assessment of what works and what does not, and willingness to engage in alternative interventions by communities.

- **Include socially and geographically excluded pockets:** There are certain geographical areas that may be regularly left out of information sharing and/or any community interventions because they are further away from the center of the town/village, are in outlying areas, or are sparsely populated. Special efforts need to be made to ensure that socially and geographically excluded pockets are included.
- **Create an enabling environment:** It is important to create an enabling environment in which individuals can empower themselves to address the local needs of the communities to prevent and control dengue.
- **Hierarchy in local systems may affect participation:** It is important to focus on improving information dissemination systems that ensure that all community members are informed about interventions, and to help strengthen mechanisms that ensure engagement of different community members and groups.
- **Implement interventions to coincide with local calendars:** It is more likely that there will be behavioural impact and at the same time programmes will be more cost-effective if close attention is paid to seasonal variations and human behaviours and strategies are tailored and resources are concentrated accordingly. For example, there can be tremendous seasonal variation in how big a threat dengue is or how much of a problem mosquitoes are perceived to be – and hence people’s motivation to take action. It may be best to launch or intensify activities when local concerns are at their highest, rather than all-year round or only when virological surveillance indicates a risk of potential outbreak. Nevertheless, matching community action with periods of high transmission should remain an important programme feature.
- **Leadership modalities – strong individuals or committee driven:** An assessment of different leadership modalities from a WHO evaluation revealed that roughly half of the programmes were led by strong, forceful individuals, while the others seemed to be more ‘committee driven’, with two to several individuals sharing responsibility and decision-making. Neither model seemed to have an advantage over the other. But in most cases, the model that was chosen by the community seemed to be the best one for them. The advantages of a programme are that their investment of energy and enthusiasm will often achieve more results in the short term, while the downside relates to the unclear implications for longer term sustainability to regions without such individuals. It is best left to the community to decide on the leadership modality.
- **Involve Community Based Organizations and Faith Based Organizations:** Ensure active involvement of Community Based Organizations (CBOs) and Faith Based Organizations (FBOs).
- **Regular two-way feedback:** Regular feedback from community members to health officials and vice-versa should be maintained. In a community-based programme, it is important to give feedback to the community about the successes, failures, and benefits of the programme and also receive feedback from the community. Such feedback helps in retaining continued support from communities, and thus in sustaining the programme.

- **Change in behaviors takes time and requires sustained efforts:** Communities need to be sensitized frequently. Once dialogue has been initiated in each community, periodic visits and opportunities for engagement with families and communities would be needed. Especially in the first year more intensive efforts will be required.
- **Need to be gender-sensitive:** When designing behaviours, messages, and materials that target “households”, attention needs to be paid to the roles, status and time commitments of different household members – particularly when targeting women. Dengue control programmes may have a positive or negative impact on women’s power and authority in the domestic domain. An example of a negative impact would be the communication of messages stating that domestic environments are “unclean” and result in mosquito breeding, even though most householders (especially women) spent significant time in maintaining a clean house according to their notions of “hygiene”. Used tyres may be a man’s domain, in which case male audiences should be targeted.
- **Locality and community specific** - Need to be locality specific (Urban, Rural, Slum , School etc).
- **Linking with external resources:** Assist in linking communities with external resources to aid them in their efforts to improve health.
- **Understanding community dynamics:** In order to have better community participation, there is need to understand and analyze the community dynamics and adjust to that situation. Utmost care should be taken to introduce a new intervention that is contrary to existing practices and beliefs. There is also the need to give respect/importance to negative experience of the community and efforts should be taken to minimize it not by sharing but taking appropriate action to improve it.

Goal, outcome and objectives of community participation

Goal: Contributing towards a vision of ‘Dengue free India’ the goal of community participation is to prevent dengue transmission and reduce dengue related morbidity and mortality in India.

Expected Outcome: It is expected that increased community participation will reduce vector density leading to decline in incidence of dengue and reduce case fatality due to dengue.

Behavioral Objectives: It is important to move programmes beyond awareness-raising to the achievement of precise behavioral objectives (not just awareness raising and knowledge changing). The main behavioral objectives of community participation are as below:

- 1) To ensure communities participate actively in planning, implementing and monitoring of Dengue control activities.

- 2) To ensure communities actively participate in vector control measures by environmental management for source reduction (reducing sources of larval habitats) in and around their homes.
- 3) To ensure communities use personal protection methods (through use of various means such as protective clothing, repellents, mosquito coils, bed nets etc.) to reduce human–vector contact.
- 4) To encourage communities for early identification/detection and treatment seeking for DF.

Behavioral Results: Many community based programmes on *Ae. aegypti* control focused on educating the community about dengue and how to prevent dengue transmission by controlling the principal vector, *Ae. aegypti*, in the domestic environment. They were highly successful in educating the community about dengue and its prevention. Unfortunately, knowledge about a disease problem does not translate into action to prevent the disease. Thus, even though people in many dengue endemic countries are very knowledgeable about the disease, they take no action to control the mosquito and prevent transmission.

The presence, or at least the density of *Ae. aegypti* to a large extent depends on human behaviour. So community participation for prevention and control of dengue should always lead to behavioral results. Vague participation (e.g. having an NGO representative attend programme planning meetings with no subsequent action) is a waste of resources. There is need for a thorough understanding and focus on behaviors related to management of the larval habitats of the main dengue vector, as well as treatment-seeking behavior. Examples of such target behaviours could include covering water storage containers to prevent fresh egg laying by *Aedes*; puncturing holes in tyres used for recreational purposes by children and leveling or filling-in the tops of nods in bamboo fences to prevent the accumulation of water , wearing full sleeved clothes, trousers for personal protection.

**Community should be
repeatedly told that Dengue is
preventable and together we
can make a difference**

Chikungunya, Dengue Fever, Yellow Fever and Zika are mosquito-borne viral diseases transmitted to humans by day-biting *Aedes aegypti* and *Aedes albopictus* mosquitoes.

Chikungunya: It is a debilitating non-fatal viral illness caused by Chikungunya virus. The disease re-emerged in the country after a gap of almost three decades. Chikungunya outbreaks typically result in large number of cases but deaths are rarely encountered. Symptoms of Chikungunya fever are most often clinically indistinguishable from those observed in dengue fever. However, unlike dengue, haemorrhagic manifestations are rare and shock is not observed in Chikungunya virus infection. It is characterized by fever with severe joint pain (arthralgia) and rash. Joint pains sometimes persist for a long time even after the disease is cured. There is neither any vaccine nor drugs available to cure the Chikungunya and the cases are managed symptomatically.

ZIKA: Zika virus disease is an emerging viral disease transmitted through the bite of an infected Zika is spread mostly by the bite of an infected *Aedes* species mosquito (*Ae. aegypti* and *Ae. albopictus*). Zika can be passed from a pregnant woman to her fetus. Infection during pregnancy can cause certain birth defects. There is no vaccine or drug for Zika. Brazil has seen the highest number of people affected with the disease. There is no case reported due to ZIKA in India till date.

Yellow fever: It is an acute viral haemorrhagic disease transmitted by infected mosquitoes. The "yellow" in the name refers to the jaundice that affects some patients. Symptoms of yellow fever include fever, headache, jaundice, muscle pain, nausea, vomiting and fatigue. A small proportion of patients who contract the virus develop severe symptoms and approximately half of those die within 7 to 10 days. The virus is endemic in tropical areas of Africa and Central and South America. The case fatality ratio is very high.

Yellow fever is prevented by an extremely effective vaccine, which is safe and affordable. A single dose of yellow fever vaccine is sufficient to confer sustained immunity and life-long protection against yellow fever disease and a booster dose of the vaccine is not needed. The vaccine provides effective immunity within 30 days for 99% of persons vaccinated. There is currently no specific anti-viral drug for yellow fever. There is no case reported due to yellow fever in India till date.

PLAN OF ACTION FOR COMMUNITY PARTICIPATION TO ACHIEVE BEHAVIORAL RESULTS

This document is to guide the States in the process of preparing their action plans for community participation to prevent and control dengue. It provides a 'roadmap'/plan of action which can be adapted by different States depending on their contexts. Implementing interventions and activities for effective community participation can convince people to adopt or maintain behaviours that will prevent vector breeding in and around their homes, ensure personal protection against Dengue and timely treatment seeking in case of fever.

Motivating the community and invoking participation: As a first step, it is important to motivate and invoke community participation by showing concern. Community and government organizers should reflect true concern for human suffering, i.e. morbidity and mortality due to dengue in the country, economic losses to the families and the country, and how the benefits of the programme fit into the people's needs and expectations. Based on surveillance data, the number of DF cases and case fatality (in any) from that community can be shared to make people understand the extent of the problem.

Initiating dialogue: Community organizers and opinion leaders or other key personnel in the power structure of the community, such as women's groups, youth groups and civic organizations, should be identified. Dialogue can be undertaken through personal contacts, group discussions, community meetings, film shows etc. Interaction should generate mutual understanding, trust, confidence, enthusiasm and motivation. The interaction should not be a one-time affair, but should be a continuing dialogue to achieve sustainability.

Joint planning and implementation with the community: For the purposes of joint action planning and implementation with the community some of the most crucial steps to be taken such as mapping of possible breeding sites, possible community actions/target behaviours and the target population who could be involved are given under the following sections. An example of a filled in action plan is provided at Annexure-A.

Mapping and listing of all possible breeding sites by specific places: Mapping of homes, schools, offices, playgrounds, plantation areas, factories need to be carried out along with the community. A list of possible Dengue vector habitat/breeding places and suggestive actions by community which may be referred to while undertaking the mapping exercise with community members is provided At Table -1.

Table -1: Dengue vector habitat/breeding places and suggestive actions by community

Habitat	Breeding source in order of their availability		Actions required
Urban house holds	Indoor situation	Water holding Containers (drums/tins/barrels/pitchers/syntax tanks/cement tanks), money plant, water cooler, refrigerator trays, flower vases, Flower pot, pans earthen pots Discarded containers Old toys, potted plant trays, glassware, coconut shells, empty canes/bottles	Detection and elimination of positive containers, Observing dry day once in a week, Covering water storage containers Remove of all discarded junks materials every week
	Peri- domestic	Tyres, unused hardware machinery/materials like furniture/condemn items, coconut shells, throw away tin/cans/containers, flower pots, bird bath/pots, tree holes, leaf axils , bamboo stumps	Disposed of discarding unused containers, Keeping big containers upside down Filling bamboo stump with sand / mud
	Roof top	Overhead tanks, discarded containers/drums, tyres, blocked drains, eves of porticos, unused hardware machinery/material like furniture/condemn items , flower pots, bird bath/pots	Disposed of discarding unused containers, Keeping big containers upside down
Multistory Houses	Indoor/roof top	Water holding Containers (drums/tins/barrels/pitchers/syntax tanks/cement tanks), money plant, water cooler, refrigerator trays, flower vases, earthen pots Discarded containers Old toys , potted plant trays, glassware, coconut shells, disposable glass/ice cream cups, discarded cold drink bottles/cans, Trays under potted plants	Detection and elimination of containers positive for <i>Aedes</i> breeding, Observing dry day once in a week, Covering water storage containers Weekly emptying water in trays plants
Houses/huts in JJ Colony	Indoor/roof top	Water holding containers (drums/tins/barrels/pitchers/syntax tanks/cement tanks), water coolers, earthen pots	Detection and elimination of containers positive for <i>Aedes</i> breeding , Observing dry day once in a week,

		<p>Discarded containers At roof of huts/houses tarpaulin sheets holding water during rainy season, Old toys, potted plant trays, glassware, coconut shells</p>	Covering water storage containers
Rural house holds	Indoor/roof top/ surroundings	Water holding container (drums/tin/barrels/pitchers/syntax tanks/cement tanks), water cooler, refrigerator trays, earthen pots, containers used for cattle feeding, grinding stones kept outside, old tyres/rotten fruits/bamboo stumps	Detection and elimination of containers positive for <i>Aedes</i> breeding , Observing dry day once in a week, Covering water storage containers, Covering bamboo stumps in fencing by half cut plastic bottles like a cap or by filling mud
Schools	Peri-domestic/roof	<p>Water holding container (drums/tin/barrels/pitchers/syntax tanks/cement tanks), water coolers, flower vases, earthen pots</p> <p>Discarded containers Disposable glass/ice cream cups, discarded cold drink bottles/cans, potted plant trays, glassware, coconut shells, tyres, unused hardware, machinery/material like furniture/condemn items, coconut shells, throw away tin/cans/containers), tree holes, plant axils, bamboo stumps, overhead tanks, bird pots</p>	<p>Involvement of children in detection and elimination of containers positive for <i>Aedes</i> breeding ,</p> <p>Covering water storage tanks and containers</p> <p>Proper disposed of discarded containers</p> <p>Strengthening IEC with students/Teachers/staff</p>
Market Area/ Work place	Survey in market area shops etc.	Water holding container (drums/tin/barrels/pitchers/syntax tanks/cement tanks), money plants, water coolers, refrigerator trays, flower vases, earthen pots, coconut shells	<p>Detection and elimination of containers positive for <i>Aedes</i> breeding , Observing dry day once in a week, Covering water storage</p>
	Inside offices factories/ commercial complexes	Water holding containers (drums/tin/barrels/pitchers/syntax tanks/cement tanks), money plant, refrigerator trays, earthen pots, coconut shells, water coolers, AC ducts, flower pots, artificial	

		containers having ornamental plants, money plants etc., toilets/cisterns	containers, Strengthen IEC in public places
	<i>Over the roof</i>	Overhead water tanks, unused hardware material including condemned furniture and other articles which may accumulate water in rainy seasons, drains, blocked gutters, tyres, eaves of porticos, flower pots, bird pots	
	In the campus/ compound of godowns	Unused receptacles (bottles/tins/buckets/drums), flower pots, cement tanks, coconut shells, disposable articles	
	Canteens /cafeterias in Market	Water storage containers and other discarded thrown away articles, disposable articles	
Police Station	Outside	Malkhana/abandoned vehicles	Source reduction and periodical insecticidal spray IEC to concerned officials
Workshop	Inside/outside/ roof top	Junk material/raw material dumping	Source reduction/ periodical Insecticidal spray and junk should be removed/ covered or placed under a shed
Hotels	Inside room	Water coolers, AC ducts, flower pots, containers having ornamental plants , money plants, toilets/cisterns, canteens/cafeterias	Detection and elimination of containers positive for <i>Aedes</i> breeding , Observing dry day once in a week, Covering water storage containers IEC to concerned
	Courtyard	Tyres, unused hardware machinery/material like furniture/condemn items, coconut shells, through away tin/cans/containers flower pots, bird pots, ornamental pond/fountain, tree holes, plant axils, bamboo stumps	
	Roof top	Overhead/water tanks and water accumulated under tanks, discarded thrown away articles	
Survey in hospital /	In side hospital	Water coolers, AC ducts, flower pots, artificial	

Medical College and Residential houses		containers having ornamental plants , money plants in OPD, overhead/water tanks in wards and sometimes in operation theaters, toilets/cisterns, canteens/cafeterias	<p>Detection and elimination of containers positive for <i>Aedes</i> breeding , Observing dry day once in a week,</p> <p>Covering water storage tanks containers</p> <p>Strengthen IEC in public places</p>
	Over the roof	Overhead water tanks, unused hardware material including condemned furniture and other articles which may accumulate water in rainy seasons	
	In the campus/ compound	Unused receptacles (Bottles/tins/buckets/ drums), flower pots, cement tanks, thrown away disposable articles, tree holes etc.	
	Hostels-boys/ girls/nursing/ training hostels situated in the campus	AC duets, Trays/ Coolers/water tanks etc., Kitchens of the hostel have potential breeding articles/places	
	Residential houses (Officers/Servant quarters/staff quarters)	Household containers/ coolers etc. as described above	
	Construction sites within hospital campus	Water storage cement/metallic tanks and unused hardware articles kept in the open	
	Tea shops/ Dhabas in compound	Water storage containers and discarded disposable thrown away articles	
Factory/ project area /construction sites	Temporary settlements and huts	Water storage cement/metallic tanks and unused hardware articles kept in the open, water stagnation for more than one week for roof curing	Empty the water containers every week, curing water should not be left for more than six days

Public places of worship like Temple/ Mosque / Gurudwara /Church and Cinema halls/ recreational places	-	Water storage containers and discarded disposable thrown away articles, coolers, bird pots Roof tops – water storage tanks , gutters etc.	Detection and elimination of containers positive for <i>Aedes</i> breeding , Observing dry day once in a week, Covering water storage tanks, containers Strengthen IEC in public places
Plantation areas	Rubber	Collection cups for latex, decomposing seeds	Empty the cup every six days, remove decomposing seeds
	Pine apple	Leaf axils	Monitor and if needed sprinkle safe insecticide with the help of Health Worker
	Bamboo	Open bamboo stumps with water	Fill the open stumps with soil. Cut the bamboo from nod areas leaving minimal open space and making a V shaped cut allowing draining out the rain water
	Palm trees – Coconut , Arecanut	Leaf axils, decomposing Fruits	Monitor and remove offshoot leaves and fruits every week

Note – The above list is based on the field observations of NVBDCP Officers/Consultants. However, there may be some unusual types of breeding source in some situations. It is important to remember Dengue causing *Aedes* is primarily a container breeder.

Possible Community Actions/Target Behaviours: Based on the mapping and listing different sets of community actions might be relevant in different areas depending on the context, risk of transmission, the needs of the community and the time of the year. No single activity or material (e.g. poster) will result in behavioural impact. Based on the community, as part of the planning exercise a judicious mix of different but integrated actions appropriate to the behavioural objective being sought will be required. Possible community actions/target behaviours to help with the planning process with communities are provided below.

Possible Community Actions/Target Behaviours for vector control measures by source reduction (reducing sources of larval habitats)

a. Covering domestic water-storage containers

The major source of *Ae. aegypti* breeding in most urban areas are containers storing water for household use, including clay, ceramic, cement, water jars, metal drums, and smaller containers storing fresh water or rainwater. Water storage containers should be covered with tight fitting lids or screens and care should be taken to replace them after water is used.



Rain water harvesting units can be mosquito proofed by properly covering water drums or other material which allows rainwater, but not mosquitoes to enter. Large volume (>500 liters) water storage tanks need to be covered and should have inlets and overflow outlets with mosquito wire mesh.

b. Cleaning/scrubbing of domestic water-storage containers

Periodically cleaning and scrubbing the inside of water containers/jars can help to destroy *Aedes* eggs at the time of container cleaning. Temephos (1PPM) needs to be applied on a weekly basis in case water containers cannot be emptied. Big water drums and small earthen jars need to be turned upside down once a week. Filtering water from one container to another through cloth can help to trap and dislodge larvae and pupae.



c. Cleaning of water coolers, ACs, refrigerators

Desert (evaporation) water-coolers, condensation collection pans under refrigerators, and air conditioners should be regularly inspected, drained and cleaned. These require special attention as potential breeding spots in places like government buildings, hospitals, schools, religious places, public places, cinema halls, theaters, malls, entertainment venues. Anti larval measures with Temephos granules may be applied fortnightly. Wherever possible these potential breeding spots need to be dried up once in a week.



d. Mosquito-proofing of overhead tanks or underground reservoirs

Where *Ae. aegypti* larval habitats include overhead tanks and masonry chambers of piped waterlines, these structures should be mosquito-proofed with tightly fitted lids. Similarly, mosquito-proofing of domestic wells and underground water-storage tanks should be ensured.



e. Draining water supply installations

Water collection/leakages in masonry chambers, distribution pipes, valves, sluice valves, surface boxes for fire hydrants, water meters, etc. that serve as important *Ae. aegypti* larval habitats in the absence of preventive maintenance.

f. Managing discarded receptacles

- Discarded receptacles – viz: tins, bottles, buckets or any other consumable packaged items such as cups/trays and waste material, etc. should be removed and buried in landfills.
- Scrap material in factories and warehouses like tyres, metal boxes, discarded appliances, sinks, basins, vehicle frames and parts of other items on industrial and commercial premises should be kept in sheltered areas protected from rainfall.

- Household and garden utensils (buckets, bowls and watering devices) should be kept upside down to prevent accumulation of rain water.
- In coastal areas, water from canoes and small boats should be emptied and turned upside down when not in use.
- Plant waste (coconut shells, cocoa husks, etc.) should be disposed of properly.



g. Managing glass bottles and cans

Glass bottles, jars, cans and other small containers, coconut shells and husks, cocoa pods and other items that can collect and hold water should be reused, recycled or buried in landfills.

h. Disposal and recycling of used/old tyres

Used automobile tyres are of significant importance as breeding sites for urban *Aedes*, and are therefore a public health problem. Imported / used tyres are believed to be responsible for the introduction of *Ae. aegypti* and *Ae. albopictus* into newer areas. Tyres in depots should always be kept under cover to prevent collection of rainwater. New technologies for tyre recycling and disposal are continually coming into use, but most of them have proved to be of limited application or cost-intensive. It is recommended that each community should look at ways to recycle/reuse used tyres so that they do not become breeding habitats. Old tyres need to be shredded or cut into flat pieces and disposed in properly constructed and managed landfills away from populated areas. To prevent accumulation of water holes need to be punctured in tyres used for recreational purposes by children in schools, parks and beaches.



i. Cleaning flowerpots/vases and ant-traps and changing water of pet bowls and bird baths

Flowerpots, flower vases and ant-traps are common sources of *Ae. aegypti* breeding. Water collection in flower vases should be removed and discarded weekly and vases should be scrubbed and cleaned before reuse. Alternatively, live flowers can be placed in a mixture of sand and water. Ant-traps to protect food-storage cabinets should be cleaned on a weekly basis and treated with common salt or oil. Water in bird baths need to be changed at least twice each week and pet's water bowls need to be changed daily.



j. Managing public places

Structures in public places such as street lamp posts, park benches and litter bins also collect water, they should be regularly checked. Discarded receptacles that may hold water, such as plastic cups, broken bottles and metal cans, should be regularly removed from public areas. Weeds and tall grass need to be cut to reduce the available outdoor resting places for adult mosquitoes near houses.

k. Filling up of cavities of fences

Fences and fence-posts made from hollow trees such as bamboo should be cut down to the node, and should be filled with sand or concrete to eliminate potential *Aedes* larval habitats. Waterlogged tree holes should also be drained.

l. Managing plantation areas

Rubber plantations: The latex collecting cups in rubber plantations should be removed during monsoon season or should be kept upside down to avoid holding of rain water.

Coconut/Areca nut plantations: The shoot off fruits and leaves of coconut should be removed weekly. Similarly the leaves of arecanut should also be removed. The plantation area may be cleaned weekly to avoid any water collection that allows breeding of *Ae. albopictus*.

Pineapple plantations: Neem-cake (which is used as manure) powder can be sprinkled in the plantation area to avoid *Ae. albopictus* breeding in leaf axils.



m. Use of larvivorous fish

Use of larvivorous fish (e.g. *Gambusia*) could be used in ornamental fountains ponds, etc. is also recommended, to prevent mosquito breeding in domestic and peri-domestic areas or residential blocks and government/commercial buildings, construction sites.

n. Managing mandatory water storage for fire-fighting

Fire prevention regulations may require mandatory water storage in some places. Such storage tanks need to be kept mosquito-proof. These drums should be kept covered with tight lids; failing which larvivorous fish or Temephos (1PPM) can be used.

o. Managing construction sites and building exteriors

Water-storage facilities at construction sites should be mosquito-proof. Efforts should also be stepped up to prevent occurrence of water stagnation. Drainage pipes of rooftops, sunshades/porticos often get blocked and become breeding sites for *Aedes* mosquitoes. Roof gutters of industrial/housing sheds also get similarly blocked. Where possible, the design of such features should minimize the tendency for mosquito breeding. There is a

need for periodic inspection of such structures during the rainy season to locate potential breeding sites.

p. Observation of dry day

Every week dry day should be observed by the community for source reduction.

Possible Community Actions/Target Behaviours to ensure personal protection to reduce human–vector contact

a. Protective clothing

Clothing reduces the risk of mosquito bite if the cloth material is sufficiently thick or loosely fit. Long sleeves and trousers with stockings may protect the arms and legs, which are the preferred sites for mosquito bites. School children should adhere to these practices whenever possible.

b. Mats, coils and aerosols

Household insecticidal products, viz. mosquito coils and aerosols can be used extensively for personal protection against mosquitoes. The timing of the use should coincide with the peak biting times of the *Ae. aegypti* mosquito, eg. early morning or late afternoon (need to spray bedrooms, including closets, bathrooms and kitchens by removing/covering all food items properly and close the room for 15-20 minutes). Electric vaporizer mats and liquid vaporizers marketed in all urban areas can be used. Burning of coconut shells and husks can help to repel mosquitoes.

c. Repellents

Repellents are common means of personal protection against mosquitoes and other biting insects. These are broadly classified into two categories, natural repellents and chemical repellents. Essential oils from plant extracts are the main natural repellent ingredients, such as citronella oil, lemon grass oil and Neem oil. Chemical repellents can provide protection for few to several hours.

d. Screens/wire mesh on doors and windows

Tight-fitting screens/wire mesh can be used on doors and windows to prevent mosquitoes from entering a particular place.

e. Mosquito nets/bed nets

Mosquito nets have limited utility in dengue control programmes since the *Aedes* bites during the day. However, nets can be effectively utilized to protect infants, and hospital setup. They can also be effective for people who generally have an afternoon nap. Bednets need to be used at hospitals during dengue fever to prevent mosquito bite and to interrupt transmission.

Possible Community Actions/Target Behaviours to ensure early identification/detection and treatment seeking for dengue

- Ensure no self-medication and early consultation with a doctor
- Do not insist for hospitalization unless advised by a doctor, as all dengue patients do not require hospitalization
- Facilitate early hospitalization when advised
- Ensure use of Paracetamol, plenty of fluid intake and rest in case of fever
- Get your blood tested for dengue

Target population: Based on the mapping and listing once the specific target behaviours are identified it is important to identify the target population who will undertake these target behaviors. Depending on the target behaviour and the context this will vary and may include some or all of the following:

- Households
- Resident Welfare Associations (RWAs)/Mohalla Sabhas/Executive Associations of Buildings or Societies
- Opinion Leaders
- Panchayati Raj Institution (PRI) members
- School and colleges (students and teachers)
- Youth Groups
- NCC/NSS
- Private doctors/Traditional Healers/RMPs
- Medical Associations
- Market Associations
- Self Help Groups (SHGs)
- Ward Committee
- Community Based Organizations (CBOs)
- Faith Based Organizations (FBOs)/Religious Leaders
- Mahila Arogya Samitis (MAS)
- Non-governmental Organizations (NGOs)
- Environmentalists
- Commercial business owners
- Construction site managers
- Offices (Officials)/Industries (workers/staff/employer)
- Village Health Sanitation & Nutrition Committee
- Peripheral Health Workers including ASHAs and ANMs

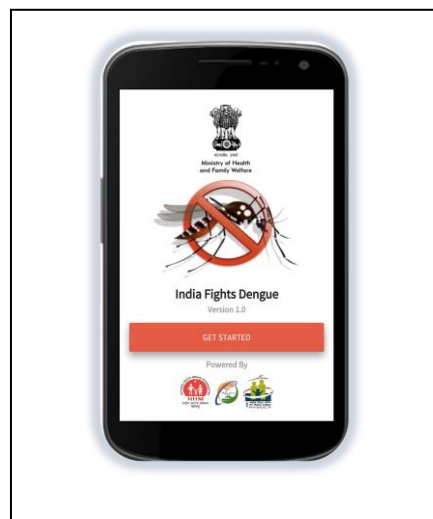
Identify key factors and risk perceptions that influence behavior change: Individual behaviour change does not result from improved knowledge alone and cannot be promoted in isolation from the broader social context in which it occurs. Therefore, one of the most critical steps in the planning process is to explore the full range of factors and risk perceptions that must be addressed to effectively change behaviours and ensure target behaviours are undertaken.

Individual's health behaviour is determined by: As part of planning process, it is important to identify four main elements which determine individual behavior such as i) perception of the likelihood (susceptibility) to illness (dengue); ii) perception of the seriousness (severity) of illness (dengue); iii) perceived benefits of taking health action; iv) perceived barriers to taking health action. These four perceptions are elements that determine the readiness to take action. As part of planning process, it is important to identify these elements that may most influence the target behaviour of the target population. And once the influential factors are identified, the range of interventions/activities required to overcome or enhance these key factors can be decided.

To ensure that these factors are identified the “community” needs to be intimately involved from the outset. This would involve listening to people and learning about their perceptions, the factors that would constrain or facilitate adoption of the target behaviour, and their sense of the costs (time, effort, money) in relation to their perception of value of the behaviour to their lives. Before implementation, these factors will also provide insights which will be useful in determining what kind of messaging is required to address different perceptions of different target populations and what kind of IEC materials would serve the purpose.

Use of IEC Materials: For raising awareness and knowledge on issues relating to dengue, a variety of print, audio visual IEC materials have been developed which address a variety of issues including information about the vector, risks of dengue, source reduction, personal protection, treatment seeking etc. A list of the key messages relating to dengue that can be used in IEC materials is provided in Annexure - B. These IEC materials include display posters; outdoor display panels, leaflets, handbills, flipbook, TV, radio, newspaper advertisements; wall writing, and painting; street plays, and drama and Mobile App. Specific materials are also available to raise awareness among school children which also includes live demonstration of the dengue vector (larvae and adult). Depending on the context the states would need to adapt, translate and use the materials that would be most appropriate for the information needs of the target audience they are working with in each community.

A mobile App called ‘**India Fights Dengue**’ developed by NVBDCP/MOHFW, GoI in coordination with National Health Portal (NHP)/National Institute for Smart Government (NISG). This App was launched by Hon’ble Union Minister for Health and Family Welfare on the event of World Health Day celebration on 7th April, 2016. This can be downloaded on mobile phone from both Google play store and App Store. The basic idea of developing this App is to empower the Community for their involvement and active participation in dengue control especially in source reduction activities. The App is an opportunity for community to get detail information about dengue, how to prevent it, Do’s & Don’ts, where to go for help etc. Besides, it also includes a link to play a Dengue Mosquito game and a Video explaining about dengue and source reduction activities. Citizens will be able to see messages to be broadcast from the Ministry/NVBDCP. It will work as a citizen interface, where communities can report dengue larvae breeding by uploading a picture and location of the site.



Interventions/activities that can address key factors to ensure and encourage community participation

Interventions that best address the key factors and ensure that the target behavior is undertaken will need to be decided based on the identified key factors and the community context. To help with this process of planning interventions/activities some possible interventions are suggested below and some examples from other countries are also provided.

Cuttack District, Odisha:

- In 2013, a massive outbreak of dengue was occurred in Cuttack City of Odisha where 1457 dengue positive cases were detected. The total number of cases came down to 297 in 2014 and 276 in 2015.
- Practical cleanliness drive was carried out for elimination of *Aedes* breeding sources at each household and premises of all offices and institutions.
- Primary and secondary school children were sensitized during school prayer session and so they could be the direct source of information to their community. Training sessions on dengue prevention steps was taken up by principals of all colleges and for Headmaster/Head of all schools.
- Sensitization meetings were conducted involving Anganwadi Workers, ASHAs, SHGs and GKS members on prevention of dengue. Anganwadi Workers were engaged to conduct door to door visits for inspection of breeding sites, source reduction activities, interpersonal communication, distribution of leaflets, sharing of dengue preventive messages and inspection for practice of preventive measures for dengue by community.
- Dengue volunteers were engaged by Cuttack Municipal Corporation who conducted IEC activities and helped in eliminating potential *Aedes* breeding sites. NCC cadets, NSS cadets, Nehru Yuvak Sangha, volunteers and community organizers were deployed for house-to-house search and campaign activities.
- Group meetings with local public with the help of local leaders were organized in the affected areas with display of audio-visuals on Anti dengue activities. Inter-sectoral convergence meetings were held for undertaking preventive actions by different sectors.
- Puja Committees and NGOs/CBOs took key roles at community level. Puja committee members arranged video shows at their respective areas. NGO/CBOs conducted IEC-BCC activities through miking, CD playing and organizing health camps.

Source: State Programme Officer report, NVBDCP

- ✓ Communities can participate in clean-up campaigns arranged by the local health authorities or community leaders in order to collect and remove all unusable containers and potential breeding sites in and around houses.

West Zone, Delhi

During a study conducted by NIMR, Delhi in different localities of West Zone of Delhi, it was observed that elimination of *Aedes* breeding mother foci during lean period of Dengue transmission leads to low *Aedes* indices, less vector density and lower dengue cases in transmission period in the area under reference.

- ✓ *Community members can be trained for monitoring of breeding sites at the household and village/community level.* Community groups can help in weekly

checking for breeding sources of *Aedes* mosquito inside houses/peri-domestic situations and on the roof tops. (Each community group member may check atleast 10-15 houses for *Aedes* breeding sources, keep record and discuss in the weekly meeting with other members.).

- ✓ The Community/RWAs can be encouraged to organize “Swachhta Abhiyan” in their locality (residential complex/Ward/village) atleast for one hour on every Sunday during transmission season. On different Sundays it can be led by different groups such as youth on the first Sunday, second by adult members, third by school going children and can be continued from May onwards till October, (pre to post-monsoon). Best RWA/locality in each district/Zone can be awarded a certificate as a token of appreciation, if no *Aedes* breeding /dengue case is detected during this period.

Role Played by Kudumbashree in Mosquito Control Activities in Kerala

Kudumbashree (means prosperity of the family in Malayalam) is a female-oriented poverty reduction project of the Government of Kerala which was started in 1998. Women empowerment is one of the objectives of the Kudumbashree alongwith poverty alleviation and it is the largest women’s movement in Asia with 41 lakh memberships. The following are the community structures of Kudumbashree:

1. Kudumbashree Ayalkottam (neighbourhood group) at household level
2. Kudumbashree Ward Samithi at ward level
3. Kudumbashree Panchayat Samithi at Panchayat level

Kudumbashree workers are also involved in several activities related to public health. The services of Kudumbashree workers have been utilized by the Kerala Government for the mosquito control operations especially source reduction activities during the epidemics of Chikungunya and Dengue in 2006 onwards. They worked under the Local Self Government Institutions and were engaged in the collection and proper disposal of solid waste materials, de-watering of wet containers, elimination of breeding places etc. They mainly collected non-biodegradable materials such as plastic containers, discarded utensils etc. and other bio-degradable materials in separate containers. A fixed number of houses were allotted to each worker and she visited each allotted house on a regular basis for collection and disposal of solid waste. The Kudumbashree workers were also engaged in the motivation of the public to eliminate mosquito breeding places. For carrying out source reduction and community awareness, a fixed amount per house visited was paid to them through the Local Self Government. They were given necessary training before engaging in the source reduction activities and were provided with uniform, gloves etc. and a vehicle for transportation of solid waste was also given. They worked very well because all the households were quite familiar with them.

- ✓ School children can be trained on how to detect and eliminate the breeding of dengue vector in and around schools, houses and in the neighborhood. School children in groups may be taken around the school premises during games period. Dengue home work card scheme as adopted by Municipal Corporation of Delhi and few other corporations may also be adopted.

- ✓ To encourage the school students, they can be asked to cover at least 10 open containers in his/her household or in the neighborhood (under the guidance of parents) and monitor it for 6 months (whether the cover is in place or not). If no breeding is detected in those containers for consecutive 6 months

In Bucaramanga, **Colombia**, high school students were trained in *Ae. aegypti* biology and control and assisted as community-based health educators. Results over 11 years (1992–2001) showed a steady decrease (with occasional increases) in the number of houses with *Ae. aegypti* larvae present.

(by the health workers) the students can be awarded a certificate as a token of appreciation for best work towards society. *All activities by school children need be done under the supervision of adults.*

In Purwokerto, Central Java, **Indonesia**, a partnership between the local government, the Rotary Club, the Family Welfare Empowerment Organization (PKK), and municipal health services with technical support from the National Health Research Department, enabled the development of an effective community-based integrated vector control project in Purwokerto (population, 220 000) which operated at the neighborhood association level. Within each neighborhood, houses were grouped into sets of 10, known as “dasawisma”. Each dasawisma had a leader, trained in DF/DHF prevention and control, known as the “source reduction cadre”. Each dasawisma got a source reduction kit containing a flashlight for checking for the presence of larva in containers stored in dark areas, simple record forms, and a booklet for health education. The dasawisma arranged schedules, where one house inspected the other nine houses. Known as “Piket Bersama” (Picket Together), these house-to-house inspections were conducted on a weekly basis so each household took its turn every 10 weeks. The dasawisma leader collected the weekly record forms and reports the results to the next administrative level. The success of this project was measured by the reduction in the House Index from 20% before activities began to 2% once activities were running well.

- ✓ In Government and private offices, a Nodal Officer can be designated to lead and ensure all prevention & control measures to be taken in office premises.
- ✓ Community groups can help identify commercial activities such as traders dealing in used tyres, which may be contributing larval habitats for the vector.
- ✓ Community members can be trained to lead sensitization and awareness meetings about prevention and control of dengue with the different groups (at least 2-3 meetings should be arranged) using all methods of IEC including print and audio-visual tools/media.
- ✓ Community can be asked prepare a community report card to rate the activities/actions of Health Department in each Zone/District/Municipality to motivate the health workers.

In Johore State, **Malaysia**, an integrated social mobilization and communication campaign motivated householders in Johor Bahru District to destroy any larval breeding sites found around their premises, and to organize voluntary teams to inspect and control larval breeding sites in public spaces such as community halls, parks, and vacant lots. Dengue Volunteer Inspection Teams (DeVIT) were formed in 48 localities and some 615 volunteers came forward to join DeVIT teams. During the three-month campaign period, DeVIT teams advised to 100,956 people, distributed 101 534 flyers, and inspected 1440 vacant lots. The campaign resulted in a dramatic drop in the occurrence of dengue in the district; three months after the campaign, tracking surveys revealed that 70% householders were still checking their household premises. About 95% of DeVIT volunteers continue their work and many of them even requested for more responsibilities.

- ✓ Meetings and agreements with the private sector to participate in the beautification and sanitary improvement of the community as sponsors, emphasizing source reduction of dengue vectors.
- ✓ Community participation in Dengue prevention and control can be combined with other priorities of community development. Where municipal services (such as refuse collection, waste water disposal, provision of potable water, etc.) are either lacking or inadequate, the community and their partners can be mobilized to improve such services, and at the same time reduce the larval habitats of *Aedes* as vectors as part of an overall effort at community development.

These were some of the key elements of intervention from best practices in two pilot studies on community participation in dengue control in Havana and Santiago de Cuba.

- Discussion on the intervention with relevant local stakeholders and formation of a local steering committee.
- Creation of formal task forces (community working groups) at grassroots level to secure community involvement in environmental management.
- Establishment of coordination mechanisms between community working groups, health services, and local government structures to strengthen inter-sectoral coordination.
- Harmonisation of the intervention and the action plan of the local vector control programme.

Inter-sectoral coordination in controlling Dengue in, **Arunachal Pradesh**

- Pasighat, District HQ, East Siang of the State of Arunachal Pradesh reported outbreak of Dengue in 2015 and till 7th August 2015, a total of 980 dengue cases were reported House index was ranging 43.7 to 100.0% and Container index was ranging between 7.88 to 92.7%.
- For targeting aquatic stages of the vector, source reduction activities were carried out on war footing by involving various inter-sectoral partners. As the cases were more from urban areas, the activities were initiated in different wards of Pasighat Municipality in campaign mode by forming teams involving the Councilors as the team leaders. Each team included four ward members, one Medical Officer, six Paramedical staff (ANM, FW, DHV) and one person from sanitation division of the Urban Health Development and Community members. The teams visited each house for source reduction and awareness generation of the households regarding prevention of Dengue. The entire area was covered by the teams for vector surveillance and source reduction activities.
- Cases were reported from rural –urban as well. It was then continued by the households under the supervision of health dept.
- Source reduction activities were carried out in the rural areas by involving Village Head, PRI members, Village Health, Sanitation & Nutrition Committee and the schools (teachers and students).
- Inter-sectoral meetings for planning source reduction activities in campaign mode and imposition of bye-laws were held. Necessary instructions were sent to all tyres traders and scrap dealers for examination of vector breeding habitat and imposing Challans in case *Aedes* breeding was detected in their respective areas.
- The private individual households were also involved to ensure removal of water stagnation for prevention of mosquitogenic conditions.

By these efforts the outbreak was controlled effectively after a month by bringing down the *Aedes* density.

Resources: All states are to budget for implementing the strategy for effective community participation for prevention and control of dengue in their respective State PIPs under IEC. The States are also encouraged to explore funding from other avenues such as industries, local resources and funding agencies.

Benefits of community participation: Pursuing community participation for behavioural impact can bring the following benefits:

- reduced intensity of dengue transmission so that health services are not overburdened with too many clinical cases at once;
- reduction of multiple dengue infections thus diminishing the risk of DHF;
- communities are primed to take rapid action in the event of an outbreak;
- enhancement of environmental health; and
- Dengue prevention and control can act as an entry point through which people gain the necessary skills to tackle other issues on their own.

Challenges in community participation

- Mosquito control is much harder today than ever before due to the massive expansion of urban populations, the increased complexity of urban ecologies, and the spread of dengue to rural areas.
- The communication environment has grown more complex, with more people receiving more information through more sources than ever before. Dengue programmes have to work even harder to capture people's attention.
- The level of investment community participation for behavioural impact requires in terms of research, planning, organization, time and social, political, and financial support is substantial.
- Identifying persons/groups in the community who can elicit community participation.

ROLL OUT PLAN

For the roll-out of this strategy and action plan a cascade training model will be adopted. A list of personnel and stakeholders who could possibly be involved at each level is provided below. States would need to decide who all will be responsible for the rollout.

Dissemination Workshop: As a first step, a workshop to disseminate the strategy and action plan on community participation will be conducted. Master Trainers (from States) will train district level trainers who in turn will be responsible for training and facilitating community participation and monitoring processes at the block/PHC/municipality level. This will be followed by other activities for sensitization of the community for effective participation.

Capacity building of Master Trainers: State nominated officials from respective states will be trained as Master Trainers on community participation. These Master Trainers would work as resource persons and further impart training to State and district level functionaries on ensuring effective community participation. The participants to be nominated by the states need to be people who will be responsible for the rollout and monitoring of the community participation strategy. The state IEC Officer/Consultant, Media Officer and State NVBDCP officials would need to be part of these capacity building workshops.

District level capacity building: In each state, a state level sensitization and capacity building workshop on community participation for Dengue control is to be organized involving State NHM, District Health Officials, zila parishads, PRI, representatives from different departments like education, urban development, rural development, water supply, sanitation, industries, civil society organizations, private industries and various stakeholders from both urban and rural areas. NVBDCP officials may also participate in these state workshops where all stakeholders will be oriented on the implementation strategy. In the urban municipalities the Urban Health Posts, Mahila Arogya Samiti, representatives from the private sector, schools, colleges, market associations etc. would need to be involved.

Observing Anti Dengue Month and National Dengue Day:

The month of July will be observed as the Anti-Dengue Month throughout country as dengue transmission is influenced by monsoon. Various types of activities and vector control measures will take place on war footing and will be followed during whole transmission period

As the transmission is correlated to monsoon, preventive activities are essentially to be implemented in pre monsoon period as a preparatory activity to curb the transmission in subsequent months.

In this regard, during 2016 first National Dengue Day was observed on 16th May across the country at state, district, block and municipal level. Henceforth, 16th May will be observed as 'National Dengue Day' every year.

At the Block/PHC level the Block Medical Health Officer (BMOH), Village Health & Sanitation Committee (VHSC), Panchayati Raj Institutions (PRI) members, Multipurpose Health Workers/Surveillance Workers, ASHAs, ANMs, representatives from schools and colleges, the Malaria Technical Supervisor (MTS), Kala Azar Technical Supervisor (KTS), Vector Borne Disease (VBD) consultant, Mass Media Officer, Block Health Educators,

Market Associations, Private sector (industries), Plantation Associations etc. will be trained and involved in the strategy rollout and action planning.

At the Village/Ward level: The RWA, ASHA, SHG, Anganwadi workers will sensitize the community on different activities that need to be carried out for prevention and control of dengue. RWA will organize the small group meetings with their association members. ASHA, Anganwadi workers and SHG members will sensitize the community by disseminating the messages on dengue during Village Health and Nutrition Day (VHND). It will be a sustainable approach to carry out activities on a regular basis to minimize vector density and thus minimize the risk of dengue transmission.

Projects for School Children: Projects for involvement of school children will be developed (in simple way) at State/District level for ensuring their active participation in dengue control activities. It will include information on identification of *Aedes* mosquito, different types of breeding sites, source reduction activities, life cycle of vector mosquito, Do's and Don't's for prevention and control of dengue. The students will complete project card/reports under the supervision of their teachers/parents and submit to the teacher within a specific time period and may be rewarded after assessment of their project.

Key people who may be involved in the strategy rollout: At the State and District level, the SPO and the DVBDO will be responsible for overseeing the overall strategy rollout; development of district level action/activity plans; preparing a context specific activity calendar and implementation of the plans. At various levels, the Mass Media Wing, the IEC/BCC Consultants, State and District VBD Officers (erstwhile Malaria Officer) can be involved. At the block level, the BMO and in the Municipal Corporations in urban areas the Municipal Health Officer would need to be involved. Block Malaria Technical Supervisor (MTS) and Kala Azar Technical Supervisor (KTS) and the Multipurpose Health Workers including ASHAs and ANMs can be involved at the block level.

More intensive efforts and frequent meetings with communities will be required during the first year of the rollout of the strategy and action plans.

Advocacy meetings: On 'National Dengue Day' advocacy meetings can be organized at all levels (State, District, Block) to bring together various stakeholders to ensure effective community participation for Dengue prevention and control.

Media sensitization: Given the vital role of media, it is important to sensitize the media for their active involvement in sensitizing the community on prevention and control of dengue. It is proposed that a media sensitization programme be conducted at the State/District level to ensure their co-operation.

Dengue transmission is highest during the monsoon season. So it is necessary to start all community programmes before monsoon season to remove all the probable breeding sources before transmission season starts.

Motivating the community and recognizing efforts: Incentives for ASHAs already in place under vector control programme, but they need to be streamlined. Presently, incentive payments for disease control programmes including dengue for source reduction is being promoted. To motivate and recognize community efforts wards/localities/RWAs which have

been dengue free for a year may be awarded a certificate of appreciation for community participation on 'National Dengue Day'. Schools which have done commendable work in vector control may also be recognized. Publicity to these awardees can also be given through newspaper and/or the State Health Authority website. Depending on the context the states can decide which may be the best means to recognize community efforts.

MONITORING AND EVALUATION PLAN FOR MEASURING RESULTS

In *Ae. aegypti* control efforts, it is difficult to observe the nature of the behavior of target populations, and therefore for monitoring purposes it is often necessary to select physical by-products of the behaviour rather than an observation of the behaviour.

The table below provides the list of process, output, outcome and impact indicators to be monitored. The outcome and impact indicators will be the same for all states. The number and type of process and output indicators to be tracked by States will depend on the nature of the state specific community participation programmes and the activities being carried out.

List of indicators to be tracked for community participation

Process indicators	Output indicators	Outcome indicators	Impact Indicators
<p>No. of MPWs/ASHA/ Field staff sensitized and trained on dengue and community participation</p> <p>Development of action plans for community participation</p> <p>No. of community teams formed and trained for source reduction</p> <p>No. of Nodal Teachers from school identified and trained</p> <p>No. of school/college specific</p>	<p>No. of Community/RWA/CBO Meetings organized</p> <p>No. of Localities participating in Community based programme</p> <p>No. of Community based groups carrying out household inspections and No of Houses checked</p> <p>No. of Community based groups inspecting public places and No of public places inspected</p> <p>No. of Sanitation Drives launched by Community groups every quarter</p> <p>No. of Sensitization Meetings organized by</p> <p>RWAs/Schools/Volunteers/FBOs /Relig-ious groups.</p> <p>No. of uncovered water containers/ overhead tanks/underground reservoirs found</p>	<p>Monitoring of following Entomological Indicators by Entomological teams of States/Zones/ Districts/Municipality every month where Community Based Models are being practiced</p> <p>House index (HI)</p> <p>Container Index (CI)</p> <p>Breteau Index (BI)</p>	<p>Reduction in number of Dengue cases</p> <p>Reduction in number of deaths due to Dengue i.e. decreased case fatality rate</p>

sensitization meetings held	No. of uncovered water containers/ overhead tanks/underground reservoirs covered by community members		
No. of sensitization meetings held with Religious Groups or Faith Based Organizations (FBOs)	No. of ACs, coolers, refrigerators cleaned and dried by month		
No. of sensitization meetings held with Market Associations/ NGOs etc	No. of old, unused tyres disposed/recycled by month		
Number and type of IEC materials used	No. of places where larvivorous fishes were introduced		
	No. of households using bednets for infants during daytime		
Means of verification			
To be reflected in Monthly reports on IEC/BCC activities	Monthly reports	Entomological reports, survey registers, Domestic Breeding Checkers (DBC's) reports	Surveillance data

Outcome indicators: The *Aedes* indices that are commonly used to monitor *Ae. aegypti* infestation action levels are the House Index, Container Index and Breteau Index which are the outcome indicators. How each of these indicators is to be calculated and its epidemiological impact is given below.

i) House index (HI): percentage of houses positive with *Aedes* breeding

$$HI = \frac{\text{Number of Houses found +ve for breeding}}{\text{Number of Houses inspected}} \times 100$$

ii) Container Index (CI): percentage of water holding containers positive with *Aedes* breeding

$$CI = \frac{\text{Number of containers found +ve for breeding}}{\text{Number of containers inspected}} \times 100$$

iii) Breteau Index (BI): number of containers positive with *Aedes* breeding per 100 houses

$$\text{BI} = \frac{\text{Number of containers found +ve for breeding}}{\text{Number of houses inspected}} \times 100$$

These outcome indicators are measured by larval surveys: For larval surveys, the basic sampling unit is the house or premise, which is systematically searched for water holding containers. Containers are examined for the presence of mosquito larvae and pupae. Depending on the objective of the survey, the search may be terminated as soon as *Aedes* larvae are found, or it may be continued until all containers have been examined. The collection of specimens for laboratory examination is necessary to confirm the species.

The outcome indicators and the impact indicators will be measured by means of the ongoing vector surveillance including the entomological report, survey registers and DBCs reports.

Ongoing monitoring and review processes:

Ongoing monitoring will be undertaken by the 19 Regional Offices of the Health and Family Welfare (ROHFW) in their states jurisdiction and from time-to-time State Programme Officers and National Programme Officers will monitor community based programmes during field visits. All states will fill up the vacant posts of Media Consultant/IEC Consultant/Extension Educator. These Officers will be responsible for implementation of the Community Based Model seeking active community participation. Till these posts are filled up, SPO will issue necessary directions to DHOs/DVBDOs.

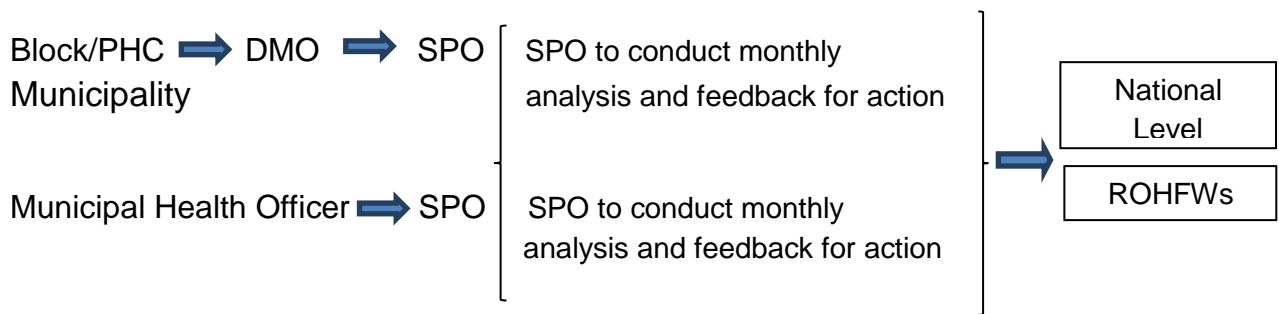
Review of progress will be undertaken on a periodic basis at different levels:

- At District level – District Collector and CMO
- At Municipality level- Municipal Commissioner
- At State level – Director Health Services and Health Secretary/Mission Director
- At the National Level – Review will be done at Annual Action Planning Meeting and at the Dengue Task Force Meeting chaired by DG Health Services.

At the District and Municipality Level, in first year review will be conducted quarterly and monthly during Transmission season.

At the State levels, review will be conducted every quarter initially followed by biannually.

Data flow mechanisms:



Each State will monitor the activities by using the Log Frame given as Annexure-C. Monthly Report will be submitted by all the states to the Directorate of NVBDCP and ROHFW on various activities being performed by them in the format given as Annexure-D.

Evaluation:

All SPOs will carry out Impact assessment of existing IEC activities being carried out by them and make necessary changes. Impact assessment will be inbuilt component of all IEC activities. States may request any research Institute to carry out Impact Assessment.

While submitting PIP, States will make budgetary provisions for evaluation and impact assessment.

At the end of three Years, an independent evaluation of the component of community participation will be conducted by an external evaluation agency.

Annexure-A: Example of a filled in action plan for community participation for dengue prevention and control

Behavioural Objective	Place (Production site)	Target population to be involved	Target Behaviour/Actions (a specific action that has a positive health outcome)	Key factors (including Risks, Perceptions, Benefits Barriers that influence Target Behaviour)	*Interventions/activities that address key factors
Source reduction	Overhead tanks, water containers, Coolers, ACs, refrigerators, plant pots in homes and offices	Family members, RWA members, office workers, managers, office maintenance and support staff	Overhead tanks and all water containers covered with tight lids, desert (evaporation) water-coolers, condensation collection pans under refrigerators, and air conditioners regularly inspected, drained and cleaned. Water that collects on the saucers placed below flowerpots removed weekly. Water in flower vases removed and discarded weekly; vases scrubbed and cleaned before reuse.	Unaware about risk during daytime, coolers, flower vases and plant pots not seen as a 'breeding site', it is not the role of office maintenance and support staff to drain and clean ACs, coolers, and refrigerators – but outsourced as AMCs to outside agency	Awareness about daytime risk and possible breeding sites in homes and offices; community task forces created who by rotation inspect households and all overhead tanks for breeding sites; all uncovered tanks and containers covered with lids, clean up drives conducted by community groups in neighborhoods. Job description of support staff to include draining and cleaning of ACs, coolers and fridges; on a fixed day every week all staff spends a part of their lunch break to clean their flower vases/pots.
	Unused tyres in factories, petrol stations, car repair shops, scrap yards	Petrol station staff, car repair shop owners, owners of scrap yards, factory owners	Shredding or cutting old tyres into flat pieces and disposing them in properly managed landfills away from populated areas.	Tyre disposal or recycling services are not available. People do not know that Aedes breeds in tyres. People like to keep tyres rather than throw them away. Health personnel and car repair shop owners do not explain tyres are a potential problem or how to manage them properly	Awareness about possible breeding sites in tyres; training of community teams on inspecting breeding sites, periodic inspection of Petrol stations, car repair shops, scrap yards, factories by community task teams; identifying options of tyre disposal and recycling services

	Playgroups in schools, parks in public places	Children, RWA, Teachers	Weeds and tall grass cut to reduce available outdoor resting places for adult mosquitoes; park benches and litter bins that may collect water regularly checked; discarded receptacles that may hold water, such as plastic cups, broken bottles metal cans, regularly removed; to prevent accumulation of water, holes need to be punctured in tyres used for recreational purposes by children in schools & parks	Unaware about risk during daytime, gardener not regularly available to trim grass & weed, irregular garbage collection services; perception that 'playgrounds are safe'; do not have tools to puncture tyres; schools reopening after long holidays	Awareness about daytime risk and possible breeding sites in parks and playgrounds; availability of tools to puncture tyres; clean drives organized every month with School children supervised by adults; inspection of playgrounds undertaken weekly by teachers and of public parks by RWA officials
Personal protection	Homes, schools	Parents, teachers, children	Wear long sleeved clothes and trousers/long pants	Culturally inappropriate, too hot to be fully covered, schools may have codes for uniforms	Educating children on daytime risk and their vulnerability; educating and advocating with schools to allow long sleeved clothes & pants
	Homes	Parents and family members of infants	Use of bednets for infants during the daytime	Unaware about risk during daytime, not have bednets for infants – specially in poor communities	Identifying households with small infants; educating parents about daytime risk and vulnerability of infants; providing bednets (maybe donated bednets from people with grownup children)
Treatment seeking		Parents, people in general	Early identification/detection of symptoms	Unaware about symptoms and vulnerability of children, do not perceive dengue as a big threat to their health	Create awareness about possible symptoms and about vulnerability of infants and children

**The preliminary list in the "Interventions" column would need to be expanded with more details to explain exactly how interventions such as "training of community teams for inspecting breeding sites" would be implemented and monitored*

Annexure-B: List of the key messages relating to Dengue that can be used in IEC materials

Key Messages:

- Dengue is preventable
- Dengue Mosquito breeds in clean stagnant water in containers in and around houses
- Dengue is caused by the bite of infected female Aedes mosquitoes
- Single bite of infected mosquito can lead to Dengue
- Dengue mosquitoes bite during day time

Do's:

- Cover all water tanks and containers with well fitted lids to prevent breeding of Dengue mosquito
- Paint inside of coolers before use in summer
- Empty, scrub and dry coolers every week before refilling to prevent breeding of Dengue mosquitos
- Put wire mesh on doors and windows to prevent entry of mosquitoes
- All unused containers, junk materials, tyres, coconut shells etc. should be properly disposed off
- Change water in flower vases, plant pots, bird bath every week to prevent Dengue mosquito breeding
- Cover the toilet seat if going out of home for more than a week
- To avoid mosquito bites wear full-sleeved clothing and use mosquito repellents to prevent Aedes mosquito bites
- Use bednet at home and hospital during dengue fever to prevent mosquito bite and to interrupt transmission
- Use aerosol, vaporizers (Coils/Mats) during day time
- Take Paracetamol, plenty of fluids and rest in case of fever

Don'ts

- Don't allow water to stagnate in and around houses in coolers, buckets, barrels, flower pots, bird baths, freeze trays, coconut shells etc.
- Don't throw broken utensils, unused bottles, tins, old tyres and other junks as Aedes mosquitoes breed in these objects during rainy season
- Don't use the old grass of cooler in the next season
- Don't depend only on platelet counts for diagnosis of Dengue
- There is no specific medicine for dengue fever, self-medication should be avoided, consult your doctor
- Don't use Aspirin
- Don't insist for hospitalization in case of Dengue fever unless advised by a doctor, as many Dengue patients do not require hospitalization

Annexure-C: Directorate of National Vector Borne Disease Control Programme

Log Frame for impact assessment of Behavior Change Communication (BCC) towards prevention & control of Dengue

➤ Components : Vector control		➤ Objective: Reduction of vector density, dengue cases and case fatality ratio		➤ Out comes		➤ Means of verification		➤ Limitations	
Target Group	Activities	Process	Implementer	Input	Measurable Indicator	Out comes	Means of verification	Limitations	
House Holds	<ul style="list-style-type: none"> -Sensitize households regarding breeding places -Live demonstration of mosquito stages -Train them to detect and eliminate possible breeding places in their premises 	<ul style="list-style-type: none"> - Small group discussion - Inter Personal Communication - Distribute IEC materials - Live demonstration in & around houses during breeding checking 	<ul style="list-style-type: none"> - House owners - Periphery level Health workers - DBC & Field supervisory personnel from States/ UTs 	<ul style="list-style-type: none"> - Knowledge about vector breeding - Insecticides i.e. Temephos - HR (DBC, ASHA) 	<ul style="list-style-type: none"> - No of households targeted and no. of households covered - No of containers checked - No. of households sensitized 	<ul style="list-style-type: none"> -Reduction in vector breeding -Reduction in Dengue cases 	<ul style="list-style-type: none"> - Survey register - Entomological report - Beat (visit) programme of DBC worker - Monitoring by Malaria supervisory staff - Report 	<ul style="list-style-type: none"> - Living habits of house holds - Availability of resources - Non-availability during day time 	
School	<ul style="list-style-type: none"> -Sensitize school teachers, non-teaching staff on breeding places -Educate children about Do's & Don'ts and breeding places 	<ul style="list-style-type: none"> - Organize sensitization programmes in schools for teachers and staff - Organize education sessions for students. 	<ul style="list-style-type: none"> - School teachers and staff - School children - School competent authority for incorporating the chapter on dengue in syllabus 	<ul style="list-style-type: none"> - Knowledge about vector breeding and Do's & Don'ts - Prototype of IEC materials 	<ul style="list-style-type: none"> - No .of schools targeted and no. of schools covered - No of teachers, staff and students sensitized. 	<ul style="list-style-type: none"> -Reduction in vector breeding -Reduction in Dengue cases 	<ul style="list-style-type: none"> - Survey/school register - Entomological report - Tour programme of Health Worker - Monitoring by Malaria supervisory staff 	<ul style="list-style-type: none"> - Poor maintenance of school compound - Long holiday of schools 	

<ul style="list-style-type: none"> - Live demonstration of mosquito stages - Train them to detect and eliminate possible breeding places in their premises 	<ul style="list-style-type: none"> - Distribute IEC materials - Display information about Do's and Don't's on the notice board - Live demonstration of mosquito stages and possible breeding places during breeding checking - Sit & draw competition among the children - School children involved in source reduction activity during their work education class - Incorporate chapter on dengue in school curriculum 	<ul style="list-style-type: none"> - DBC & Field supervisory personnel from States/ UTs - Periphery level Health Workers 	<ul style="list-style-type: none"> - HR (DBC and Health Workers) 	<ul style="list-style-type: none"> - No. of schools incorporated chapter in school syllabus - No. of drawing competition conducted - No of rallies by school children organized - No. of days/class engaged for source reduction activity 	<ul style="list-style-type: none"> - Improved knowledge on dengue prevention & control 	<ul style="list-style-type: none"> - Report 	<ul style="list-style-type: none"> - Time consuming procedure for incorporating the chapter in the syllabus
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Resident Welfare Association (RWA)	<ul style="list-style-type: none"> - Sensitize the RWA members regarding possible breeding places - Live demonstration of mosquito stages - Train them to detect and eliminate possible breeding places in their building compound 	<ul style="list-style-type: none"> - Meeting with RWA members. - Distribute IEC materials - Educate the residents through Live demonstration during breeding checking 	<ul style="list-style-type: none"> - RWA members - Periphery level Health workers - DBC & Field supervisory personnel from States/ UTs 	<ul style="list-style-type: none"> - Knowledge about vector breeding - Insecticides i.e. Temephos - HR (DBC, ASHA) 	<ul style="list-style-type: none"> - No of RWA targeted and covered - No. of meetings conducted - No. of residents sensitized 	<ul style="list-style-type: none"> - Reduction in vector breeding - Reduction in Dengue cases 	<ul style="list-style-type: none"> - Survey register - Entomological report - Beat programme of DBC worker - Monitoring by Malaria supervisory staff - Report 	<ul style="list-style-type: none"> - Living habits of residents - Lack of initiative of RWA - Non-availability during day time
FBOs & CBOs	<ul style="list-style-type: none"> - Sensitize members of FBOs & CBOs regarding breeding places - Live demonstration of mosquito stages - Train them to detect and eliminate possible breeding places in the community 	<ul style="list-style-type: none"> - Small group discussion - Inter Personal Communication - Distribute IEC materials - Live demonstration during breeding checking - Members of FBOs & CBOs in turn sensitize community people 	<ul style="list-style-type: none"> - Members of FBOs & CBOs - Periphery level Health workers 	<ul style="list-style-type: none"> - Knowledge about vector breeding - HR (DBC, ASHA) 	<ul style="list-style-type: none"> - No of FBOs & CBOs targeted and covered - No of community members sensitized by the FBOs & CBOs 	<ul style="list-style-type: none"> - Reduction in vector breeding - Reduction in Dengue cases 	<ul style="list-style-type: none"> - Survey register - Entomological report - Tour programme of Health worker - Monitoring by Malaria supervisory staff - Report 	<ul style="list-style-type: none"> - Lack of initiative/interest of FBOs & CBOs

Annexure-D: Monthly Reporting Format for Effective Community Participation for Prevention & Control of Dengue

Key strategies

- Promotion of adoption and practice of vector control activities
- Improved awareness on prevention, early diagnosis and treatment seeking behaviour
- Building effective communication skill and competency of local stakeholders/partners for improving acceptance and response towards Dengue Control
- Facilitating an enabling and empowering environment for support, leveraging, partnership, alliances and networks for prompt to action for community

1. Month:

2. Name of the State/District/Municipal Corporation:

S. No	Activity	Targeted No.	Achieved No.	Remarks
1.	No. of Teams visited			
	• School			
	• Community			
	• RWAs			
2.	No. of District/State level Advocacy meetings and workshops			
3.	No. of community level meetings conducted and population covered			
	• Focused Group Meetings			
	• School Awareness Programmes			
	• Drawing Competition at schools			
	• Rallies by School Children organized			
	• Health Education Sessions conducted by teacher			
	• Inter personal communication (IPC) to educate people			
	• Meeting with RWA			
4.	Source reduction activities conducted			
	• No. of houses visited and demonstration of breeding places			
	• No. of household voluntarily involved in Source reduction activities			

5.	Other service providers engaged for Dengue Prevention & Control activities			
	<ul style="list-style-type: none"> • NGOs 			
	<ul style="list-style-type: none"> • Faith Based Organizations (FBOs) 			
	<ul style="list-style-type: none"> • Community Based Organizations (CBOs) 			
	<ul style="list-style-type: none"> • Residence Welfare Associations (RWA) 			
	<ul style="list-style-type: none"> • Local self Government 			
	<ul style="list-style-type: none"> • Any other 			
6.	IEC materials developed and distributed			
	<ul style="list-style-type: none"> • Pamphlets/leaflets/booklets 			
	<ul style="list-style-type: none"> • Flip charts/flash cards 			
	<ul style="list-style-type: none"> • Posters/stickers 			
	<ul style="list-style-type: none"> • Hoarding 			
	<ul style="list-style-type: none"> • Wall writing 			
	<ul style="list-style-type: none"> • Announcement through PA system 			
7.	IEC activity carried out for generating awareness on Dengue			
	Electronic media:			
	<ul style="list-style-type: none"> • TV – National/Regional/Local 			
	<ul style="list-style-type: none"> • Radio – National/Regional/Fm/Local 			
	<ul style="list-style-type: none"> • Music Video/Soap Operas 			
	<ul style="list-style-type: none"> • Mobile App/Mobile messages/Twitter etc. 			
	<ul style="list-style-type: none"> • Any other 			
	Print media campaign:			
	<ul style="list-style-type: none"> • Newspaper Advertisement 			
	<ul style="list-style-type: none"> • Publication through Media Management 			

Name:

Designation:

Signature:

Date:

Suggested readings

1. Mid Term Plan for prevention and control of Dengue and Chikungunya (2011) National Vector Borne Disease Control Programme, Director General of Health Services, Ministry of Health & Family Welfare, GOI
2. Comprehensive Guidelines for Prevention and Control of Dengue and Dengue Haemorrhagic Fever, SEARO, WHO, 2011
3. Evidence based community mobilization for dengue prevention in Nicaragua and Mexico (Camino Verde, the Green Way): cluster randomized controlled trial, 2015, Andersson N et al, BMJ, doi:10.1136/bmj.h3267
4. COMBI Approach as Community-Based Intervention in Dengue Control through Leadership, Nov 2016, Suraiya, M.S., BJESBS, 13(3): 1-8.
5. Best Practices for Dengue Prevention and Control in the Americas, Strategic Report 7, 2003, Lloyd S. L.



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