SORA Technology Co., Ltd.

Demonstration project to establish a digital monitoring system for mosquito-borne infectious diseases in Cambodia using drones and AI to monitor larval habitats, aiming to promote DX such as preventing dengue fever and malaria

Objective of the project

This project aims to improve efficiency and reduce time in monitoring mosquito larvae, vectors of dengue fever, by utilizing drone and AI technologies. Traditional manual monitoring is labor-intensive and slow, hindering timely and effective countermeasures. Dengue fever, a mosquito-borne viral disease, is spreading rapidly in tropical and subtropical regions. In Cambodia, frequent outbreaks have posed serious public health challenges, especially in urban areas. The World Health Organization (WHO) recognizes dengue as a public health emergency. Our goal is to enable faster, more effective surveillance and response through innovative technology.

Cooperation with local companies/governments

SORA Technology
Local Deployment of Drones and AI
Improvement and Development of Analytical Technologies

Institut Pasteur de Cambodge
Entomological Surveys Related to Mosquito Larvae Data
Coordination with the Ministry of Health and Regulatory Authorities as Potential Clients

On-Site Coordination with Potential Clients

Ministry of Health
Center for Disease Control
National Malaria Control Program
National Dengue Control Program, etc.

Coordination with Regulatory Authorities

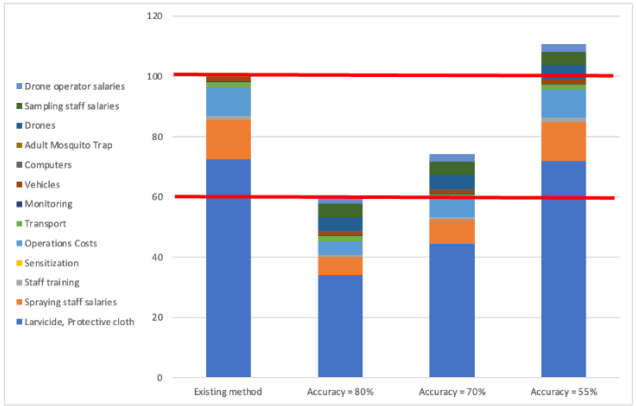
Civil Aviation Authority (Aviation Law)
Data Management Committee (Geographic Information), etc.

Targeted economic/social issues

In the Kingdom of Cambodia, countermeasures against mosquito-borne diseases are an urgent priority. In particular, dengue fever has become a serious concern, with over 12,000 cases reported in 2022. It causes symptoms such as high fever, headache, muscle and joint pain, and skin rashes. In severe cases, it can lead to life-threatening complications such as dengue hemorrhagic fever and dengue shock syndrome.

Preventing dengue fever requires the suppression of mosquito breeding, which in turn demands effective monitoring and control. However, such efforts in Cambodia currently rely heavily on manual labor, making it difficult to conduct wide-area surveillance and respond quickly. To improve this situation, we believe that effective large-scale monitoring and mosquito control can significantly help prevent dengue fever and other mosquito-borne diseases.

Moreover, the data collected through these efforts would also be valuable for forecasting the spread of infections.



Impact of Improved AI Accuracy on the Overall Cost Estimation for Larval Source Management (LSM), Including Milestone Achievements from This Development

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Demonstration period

January 2024 – May 2024

Details of demonstration

[Preliminary Research]
We conducted a baseline study on Aedes mosquitoes inhabiting Cambodia, the prevalence of dengue fever, annual healthcare costs, the Ministry of Health's budget, historical trends of dengue outbreaks, and recent infection patterns.

[Technical Demonstration]
Accurate detection of Aedes larvae requires careful drone selection. In January, we carried out surveys to identify the locations and seasonal patterns of larvae outbreaks. In February, we selected a suitable drone model, completed the purchase, and conducted test flights domestically to simulate flight conditions required for future deployment in Cambodia.

[Collaboration with Relevant Authorities]
We investigated potential international donors to Cambodia to identify funding or investment opportunities for the project. Additionally, we researched mosquito larvicide manufacturers and their products, including those with WHO prequalification, to select the most appropriate and effective agents for mosquito control.

[Field Survey]
We identified potential breeding sites for Aedes mosquitoes within Cambodia and collected training data for AI development to support automated detection.

Project outcome / future plans

1. Necessity and Effectiveness of an Efficient Detection System
Through discussions with local public health institutions such as the Institut Pasteur in Cambodia and the CDC (Centers for Disease Control and Prevention), we confirmed the urgent need for improved dengue countermeasures. Although local authorities are aware that Aedes mosquitoes tend to breed in specific areas, especially in such as discarded tires, they lack precise location data for those. Field interviews revealed that this inability to accurately identify mosquito breeding sites hinders effective response. Discussions with local stakeholders confirmed the effectiveness of a drone- and AI-based detection system in addressing this issue.

2. Broader Use of Drones
In addition to mosquito surveillance, local health officials and NCGM (National Center for Global Health and Medicine) members (interviewed via online meetings) highlighted the potential for drones to be used in pharmaceutical and vaccine delivery. This suggests broader market potential beyond larval site detection, representing a valuable outcome of the project.

3. Future Activities
Moving forward, we will strengthen collaboration with our local partner, the Institut Pasteur, and utilize their base of operations to ensure sustainable system management. By enhancing coordination with public health agencies and local communities, we aim to maximize the impact of the surveillance system.

Photo Shoot with Institute Pasteur

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