**Case Study: use of mobile app technology**

**for mangrove CONSERVATION**

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**ABSTRACT**

Mangrove ecosystem is vital lifeline for coastal states of India. It provides several ecosystem services such as prevention of coastline erosion, climate regulation, carbon sequestration, habitat for biodiversity, livelihoods for coastal community, raw material for domestic and industrial consumption, educational and recreational avenue. However, awareness about it is inadequate because of its swampy nature and remote locations. One key problem in understanding mangroves is lack of popular field guide books and inadequate resource persons to identify mangrove species.

Godrej & Boyce Mfg Co Ltd has been conserving thousands of acres of mangrove forest along western bank of Thane Creek since the decade of 1940s. In this rich biodiverse forest, we have recorded 16 species of mangrove and mangrove associated plants, which provides ecosystem services to entire Mumbai Metropolitan Region. The mangrove management at Godrej is based on three-pronged strategy of Research, Conservation and Awareness. The ISO 14001:2015 certified Godrej mangroves project has sensitized about 35,000 citizens of Mumbai Metropolitan Region in last four years alone. To know more about Godrej Mangroves, please visit [www.mangroves.godrej.com](http://www.mangroves.godrej.com).

To overcome the challenge of inadequate resource persons and field guides required for mangrove conservation, Wetland Management Services Department of Godrej & Boyce Mfg Co Ltd has developed a mangrove mobile app to enable interested individuals and organizations for identification of mangrove plant species. The app covers 67 true mangrove and mangrove associate species found in India in 11 languages. These languages include 9 regional languages of coastal states where mangroves are found along with Hindi and English. The users have choice to identify the species based on leaf shape, flower color, taxonomic, common English and regional names of the species and species location (occurrence of mangroves species in particular coastal states). Besides the identification feature, the app offers other interesting information like description of every plant species and its uses. It has a separate section on mangrove ecosystem with information on mangrove distribution, adaptations, biodiversity, threats, conservation measures and role of stakeholders. It helps the users with glossary of technical terms. The app provides optional feedback feature for users to offer suggestions for app improvement and to share relevant information. The app is available on Android, iOS, and Windows platforms.

The app is Asia's first mobile app for mangrove ecosystem and first one developed by a corporate to encourages 'citizens science', the biodiversity conservation strategy recommended world over. It is useful for researchers, teachers and students, Government agencies such as the Forest Department, Kharland or Revenue departments, NGOs and CBOs, and any other interested individuals and organizations. The app developer team has compiled useful recommendations sent by the users for its improvement through the feedback feature connected to mangroves@godrej.com email id.

Following methodology was devised and applied in development and dissemination of the mangrove mobile app.

* Data Compilation and verification:
* Images Compilation and verification:
* App Framework Development
* Technical Development
* Pilot Testing
* App Dissemination

The Godrej mangrove mobile app was first launched in July 2017 by the Honorable Chief Minister of Maharashtra state. It contained 24 true mangrove and mangrove associate species found in Maharashtra. The App was downloaded by 1314 users from 33 countries and received great appreciation and feedback. An important and consistent feedback was development of India specific Mangroves app that could be used by local coastal community, Forest Department staff on field and NGOs in their regional language for better App outreach and its efficient use.

Considering the feedback, Godrej initiated development of next version in FY 2018 and upgraded the App to 67 mangrove and associate species in 11 languages on 5th June, World Environment Day 2019.

Since its launch and upgradation, the Mangroves App has been downloaded by 4500+ users from 65 countries so far. The downloads are tracked regularly by Godrej Infotech Limited.

Godrej Mangroves App is unique in its offline operation eliminating need of internet connection once downloaded. This helps is optimum use in mangrove areas where internet connectivity is often a challenge.

The Godrej mangrove mobile app was first attempt in Asia for effective use of information and smart mobile technology for research and awareness of mangrove ecosystem. The number of downloads from across the world and feedback from users supports hypothesis of effectiveness of the mobile app. The App supports Sustainable Development Goals 9, 11, 13, 15.