

HD KOTE PHARMACOPOEIA PROJECT

Pilot-Project to

“Develop a local Medicinal plants Herbal Pharmacopoeia on an ICT platform for Advancement of Health care at Local levels using Traditional knowledge in sync with modern Database and Analysis”

Project Sanctioned by Directorate of AYUSH, Govt. of Karnataka, Bengaluru

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Project Completion Report 2021

September 2021

The University of TransDisciplinary Health Sciences & Technology (TDU), Bengaluru
Swamy Vivekananda Youth Movement (SVYM), Sargur
Karnataka State Remote Sensing Applications Centre (KRSRAC), Bengaluru

HD Kote Pharmacopoeia Project

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(Govt. Order **no HFW/227/PTD/ 2014 dated 10-02-2017**)

Executive Summary of the Project

The Herbal Pharmacopeia for Heggadadevana Kote (HDkote) taluka is an innovative, demonstrable pilot model to promote use of ecosystem specific plants in order to build self-reliance in rural communities at taluka levels for managing primary health care. It was executed through the collaborative efforts of three institutions (TDU, SVYM & KSRSAC), with a shared vision. The project proposal on herbal pharmacopoeia was submitted to Karnataka Jnana Aayoga (KJA) by TDU in 2014. The commission headed by the renowned scientist Dr. K Kasturirangan with member secretary Dr. Mukund Rao, held several rounds of discussion with expert reviewers who made valuable suggestions. It was subsequently recommended to the Dept. of AYUSH, Govt. of Karnataka for the financial support. The pilot project titled ***“To Develop a local Medicinal plants Herbal Pharmacopoeia on an ICT platform for Advancement of Health care at Local levels using Traditional knowledge in sync with modern Database and Analysis”*** was sanctioned (No. HFW/227/PTD/ 2014 dated 10-02-2017) by the Department of AYUSH, Karnataka. The project was implemented in selected villages of HD Kote from 2017 to 2019. The project has demonstrated enhancement of human wellbeing by strengthening the 4th tier of the health system viz., the household and the community healthcare knowledge.

Future scope and roadmap of the project

In PHASE 2 by extending the concept and methodology of the HD Kote medicinal plants portal to other rural talukas in Karnataka, the Government of Karnataka, can promote an effective GIS enabled strategy for community self reliance in PHC and achievement of Universal Health Coverage. Since the local plants also have effective applications for animal and crop health these dimensions should also be built into future initiative extending the scope of the portal beyond human health. An ICT enabled ecosystem specific Herbal pharmacopoeias searchable for every taluka in the state and accessible to Citizens with appropriate apps will be the most cost effective strategy for serving health needs of rural and urban populations and multiple stakeholders viz homes, women, farmers and school children. The program will be in synchrony with the emerging internationally recognized futuristic concept of “one health.” A multi faceted citizens “ONE HEALTH” medicinal plant portal, for the whole state of Karnataka should be the future goal. This project contributes to strengthening primary health in line with Sustainable development Goal (SDG-3) and has huge potential for realization of Universal Health Coverage in India, which is as yet unavailable to 70% of the population in our country.

Data from the implementation showed the following results:

Health Survey: The baseline health survey was conducted among 650 households in 30 villages of HD Kote in early 2018 and end line survey was conducted among 602 households in the year 2019 to capture the influence of health education intervention among these households. Findings of the study are given: The survey was conducted among 86% of rural population and 14% of semi-urban population. Majority of study participants were belonged to ST and OBC which constituted 35% and 26% respectively. The health status of the households in 30 villages of HD Kote was captured at the baseline and end line survey. In the baseline, almost 50% participants reported that they had minor health problems and rest 50% mentioned that their health is not good at all and none of the participants mentioned they being healthy. In the end line, number of healthy people raised to 23% and 75% of the population mentioned that, they had minor health problems as against 50% in baseline. The major difference was observed in participants mentioning their health not good from 50% in baseline to 1% in end line.

The number of households reported the common health problems were reduced in the end line survey when compared to baseline survey. Percentage of households who approached health care facility to manage their primary healthcare problems during the study period. The majority of the participants (90% in baseline & 60% in end line) reported that they consulted a doctor (Govt. hospital/ Ayurveda hospital/ Pvt. Doctor). However, the use of home remedy was increased in the end line (30%) compared to baseline survey (9%). 84% of participants in the baseline reported hospital treatment were the best option for their treatment of illness. In the end line, easy accessibility was reported as a major reason (~40%) along with the best option for the specific illness (34%). The knowledge on home remedies for the purpose of prevention of common health problems has increased to 53% in the end line as against 15% in the baseline survey. The practice of the knowledge on home remedies for the purpose of prevention of common health problems has increased to 53% in the end line as against 15% in the baseline survey. 62% of the participants reported in the end line survey that they grow medicinal plants in their courtyard as against only 9% in the baseline survey. The participants who used the medicinal plants occasionally were increased to 44% compared to 18% in the baseline. 91 species are used by the community for their primary health care.

Botanical & Ecological study: Botanical survey based on 150 plots laid across 30 sample villages in forest & non forest areas of. A plot of 0.1 ha size based on standard sampling methods resulting in 626 plant species. Among that 122 species were identified as highly significant as it comprised of 12% threatened sps, 53% traded sps and 34% of highly traded medicinal plant species.

Herbal Pharmacopoeia : was developed based on the masterlist of HD Kote, i.e 1200 medicinal plants, linking the plant resources to their Ayurvedic Pharmacology from Dravyaguna-shastra sources, classical texts, Sanskrit shlokas, Nighantus and medicinal plant usage from households. A list of context specific glossary for pharmacopoeia, with translation of Sanskrit shlokas in Kannada is made available in simple terms both in English and Kannada with user friendly interfaces on a GIS platform. Kannada translation and evaluation of the content was done at several stages by each domain experts. Herbal Pharmacopoeia comprises 30 Primary health conditions with simple herbal solutions which was developed by referring to 5000 ayurveda formulations finally churning a subset of 1125 compound formulations and 187 single drug remedies exclusively for the taluka community. If these traditionally used formulations for the HD Kote taluka are selected strategically for their high social impact potential and revalidated by competent R&D organizations, it can contribute to the design of high-impact health and livelihood security programmes for millions, especially in rural India. Also serve as resource for Ayurveda scholars.

Geo spatial database and WebGIS Portal: TDU and KSRSAC have jointly developed the Database design and Software requirement specification for developing the Web GIS portal and KSRSAC has shared the administrative layers with TDU. Through a “Many to Many” relational database process linking the spatial and non spatial data resulting into a geospatial database of comprehensive 40 tables. **A functional Web GIS database** has been developed and hosted on <http://hdkotetalukaphc.org/> with 1,203 medicinal plants, with 28,246 vernacular names, 150 plots laid across 30 villages, 4549 plant images, health survey reports, downloadable videos on herbal solutions and TOT modules on Health & Environment education, 30 primary health conditions, single plant drug remedies for 187 plants and 1125 compound formulations in English and Kannada with simple user friendly, queriable searchable interfaces. The technological tools chosen for implementation was to facilitate cost effective and easy replication of the method to other talukas by using open source softwares and tools like PostgreSQL, PostGIS, PHP, Javascript/jquery, HTML/CSS, niche frameworks like Leaflet, Ubuntu 16.04 LTS server with Apache2 HTTP server and Geoserver.

Exclusive module has been developed on KGIS-Portal by KSRSAC and web hosting of HD Kote Pharmacopoeia information done as Health GIS module: kgis.ksrsac.in/kgis/ with advanced geospatial facilities with high resolution imageries. In view of wider dissemination of information to various user groups the database has been shared on India Biodiversity Portal. [HTTPS://indiabiodiversity.org/dataTable/show/175528](https://indiabiodiversity.org/dataTable/show/175528).

Knowledge dissemination: For the identified 30 common health conditions during the baseline survey, Training of Trainers (ToT) modules and 30 brochures each consists of simple solutions for single common health conditions were developed and used for community health education. TOT modules on environment education, health education are freely downloadable from <http://hdkotetalukaphc.org/> with herbal remedies as youtube videos are made available for long time dissemination and usage by the users.

Health & Environmental Education. The science teachers and students of 8th, 9th and 10th class from 39 Higher Secondary schools (36 Govt. and 3 private schools) of HD Kote taluk in Mysore district were considered as the focal target audience. Four illustrated participatory learning modules were developed to introduce them to different topics related to medicinal plants diversity of HD Kote Subjects based on the pharmacopoeia project (Medicinal plant diversity of HD Kote, Local Health Traditions and medicinal plants for primary healthcare, conserving local medicinal plants, students and communities' role) constituted the key contents for the modules. These were used as the learning resources during the year. Four rounds of TOT of master trainers were conducted who subsequently administered these modules in the schools. Various participatory learning sessions were included in the Environmental Education initiatives. These school based sessions witnessed overwhelming participation of students and teachers, which were appreciated by everyone. More than 160 episodes of learning sessions were conducted based on the modules in the schools, in which more than 3600 students and 120 science teachers whole heartedly participated and were benefitted.

1. The Social Context of the Proposal

The University of Trans-disciplinary Health Sciences & Technology (TDU), Bengaluru in September 2014, submitted to Karnataka Jnana Ayoga (KJA), Bengaluru, a proposal entitled, ***“Develop a replicable knowledge resource for one Taluk in Karnataka (HD Kote) in the form of Geospatial Database of populations, distribution of local Medicinal Plants and a Taluk specific Herbal Pharmacopeia, on an ICT platform”***. This proposal sought to demonstrate an innovative health security strategy, to empower households & local communities in HD Kote Taluk of Mysuru district.

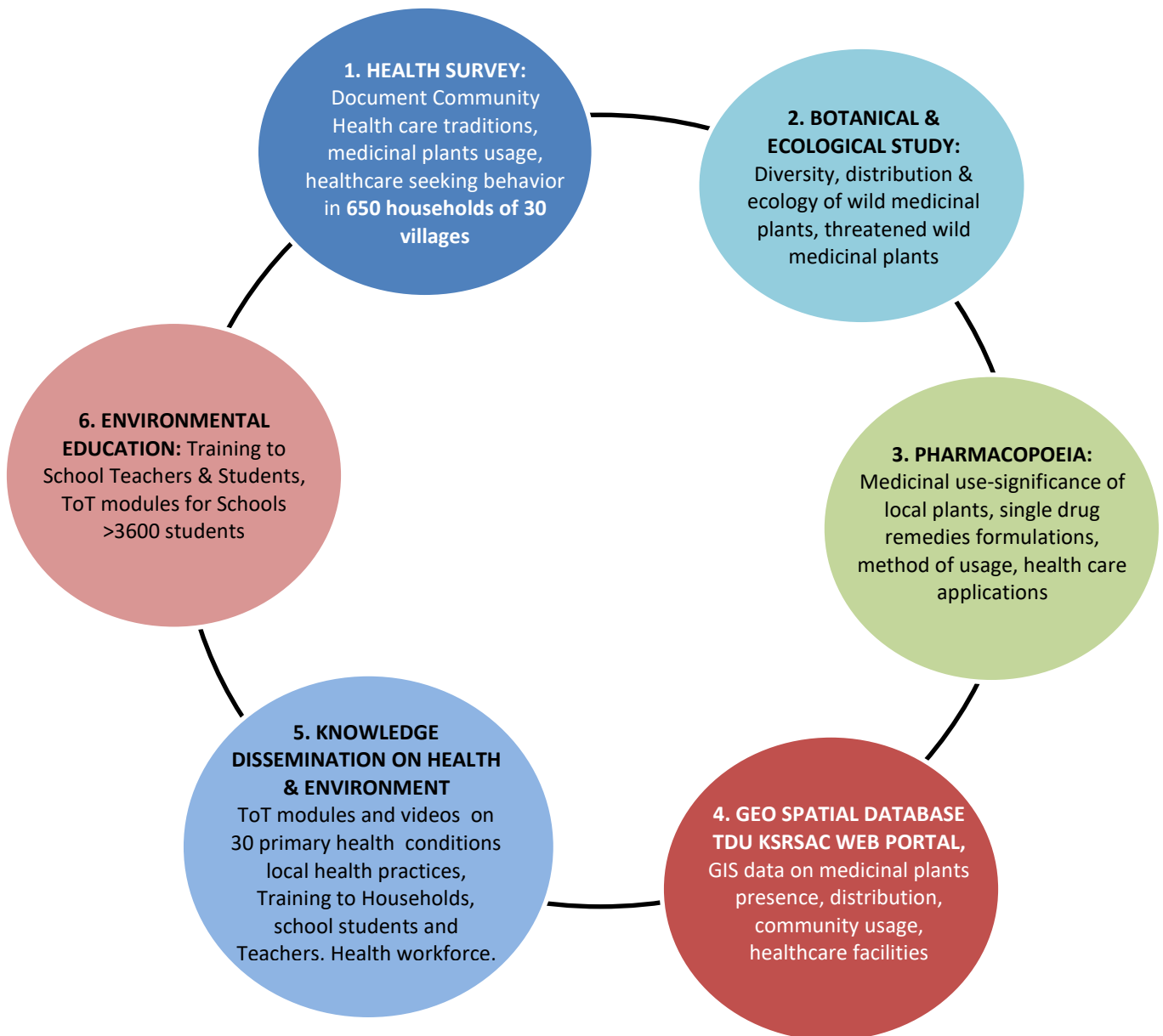
Rural communities in India are conventionally known to manage primary healthcare conditions first at the household level, and what could not be solved in the home was taken to a community based healer. If at both these levels a solution was not found, institutional help was sought from primary, secondary or tertiary healthcare providers.

Today, the first two tiers of the health system viz., the household and the community are slowly disappearing. There are many causes behind this situation. Firstly, absence of public investment in health education, targeted at households and communities. Secondly, reduced governmental support for validations and dissemination of traditional healthcare knowledge, and thirdly lack of information about the medicinal plants in local ecosystems & their uses for human, livestock health and organic agriculture.

1.1. The Financial support granted by Government of Karnataka

Considering the novelty and merit of this proposal, the government of Karnataka, approved the project for 2 years and sanctioned a grant of Rs.234.00 lakhs and released the first installment of grants of Rs.100.00 lakhs through the Directorate of Ayush vide **letter No. HFW/227/PTD/ 2014 dated 10-02-2017** & the second installment of Rs. 100.00 lakhs on 21/03/18 vide letter **No. AYUSH/09/CASH/2017-18**

1.2 THE 6 OPERATIONAL COMPONENTS

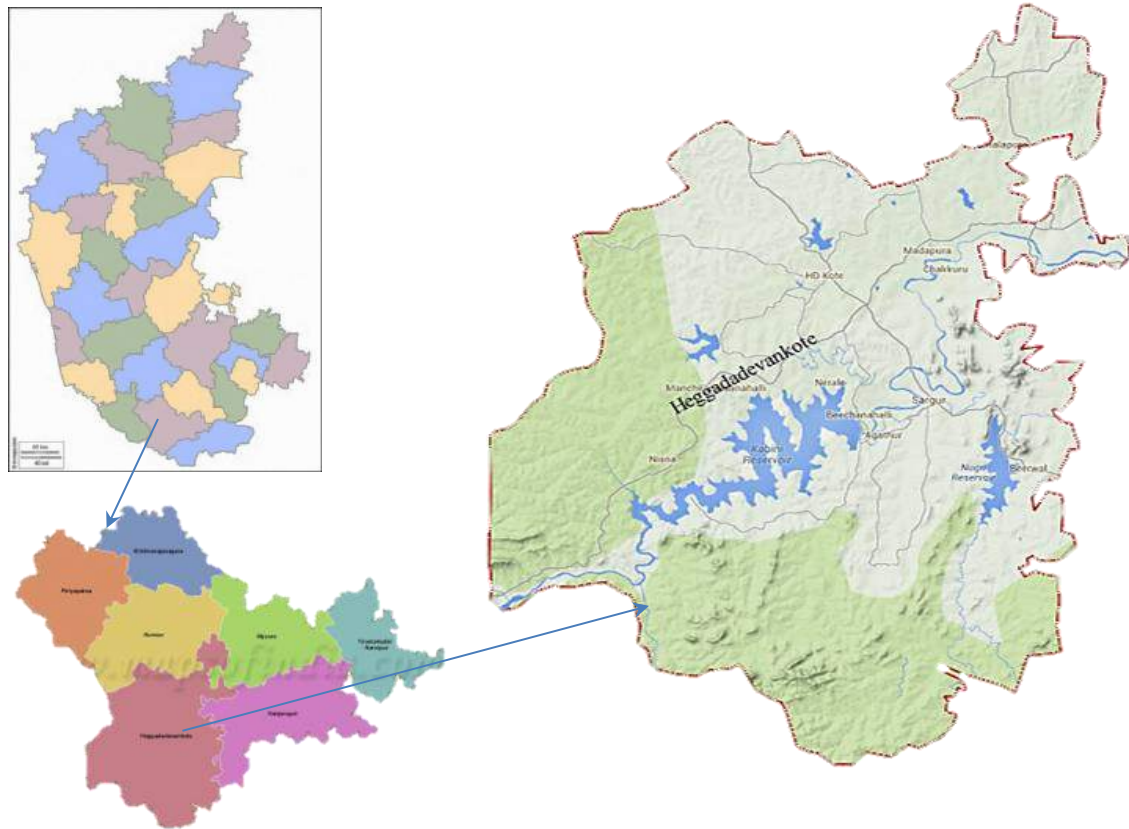


1.3 STUDY AREA

HD Kote taluk in Mysore district forms the project implementation area. This taluk has been listed as one of the backward taluks in Karnataka according to the Nanjundappa Committee report, Government of Karnataka.

SALIENT FEATURES OF HD KOTE TALUK

Panchayaths	'Backward' taluk, 1612 km ² , 5 hoblis, 241 villages & 45 Village
communities	2 Agro-Ecological situations Diverse socio-economic settings, 64000 households , 5 tribes, majority of farming
as wilderness areas	3 major rivers flow through the area, 3 Reservoirs Nagarhole NP, Wayanad WLS, Bandipur Tiger reserve
professions	Predominantly Agriculture-Horticulture based
Banana, Tobacco	Major cash crops include: Corn, Cotton, Sugar Cane, Only taluk under Western Ghats Landscape



HeggadadevanKote Taluk is quite unique from its socio-cultural-ecological perspectives. Unlike other areas, it carries many special features. Firstly, it is the home to 5 different tribes-Betta Kuruba, Jenu Kuruba, Soliga, Yerava and Paniya in addition to other communities- thus boasts of unique community traditions and knowledge. Secondly, it is the only taluk in Mysore district falling under the Western Ghats landscapes- the southern western part of the taluk is occupied by Nagarhole National Park, Bandipur National Park, Nugu Wildlife Sanctuary, Berambadi State forest, Karigala forest, Kalbetta forest, and Kakanakote forest, c) this vegetated area harbors certain very important and rare biodiversity elements, one of which is the medicinal plants- this taluk is home to >500 species of medicinal plants. Thus Heggadadevan Kote taluk offers an excellent study area for this innovative project.

1.4) KEY PROJECT PARTNERS

The project has 3 key partners: 1) TDU, Bengaluru, 2) Swami Vivekananda Youth Movement (SVYM), Saragur, Mysore, 3) Karnataka State Remote Sensing Applications Centre (KSRSAC), Govt. of Karnataka, Bengaluru.

The TDU team was responsible for designing and implementing Health Survey, Botanical studies, Pharmacopoeia development, GIS database development, Web hosting of GIS data, ToT modules and training related to Environmental Education and Health Education.

KSRSAC had extended its support for providing initially 1:10000 scale CARTOSAT imagery but made provision for much higher resolution imagery of 1:4000 scale (0.5m WORLDVIEW imagery), jointly designing of database, sharing administrative layers and webhosting of the HD kote database on KGIS platform.

SVYM extended its support in the design and execution of Health care survey, and ToT trainings on Environmental Education and Health education. It also facilitated the field execution of project activities including identification of target groups, household Health Survey, Training of households in Primary Health care, Training of School Teachers, and Yearlong Environmental education activities for school students. It also provided necessary field implementation support to TDU team.