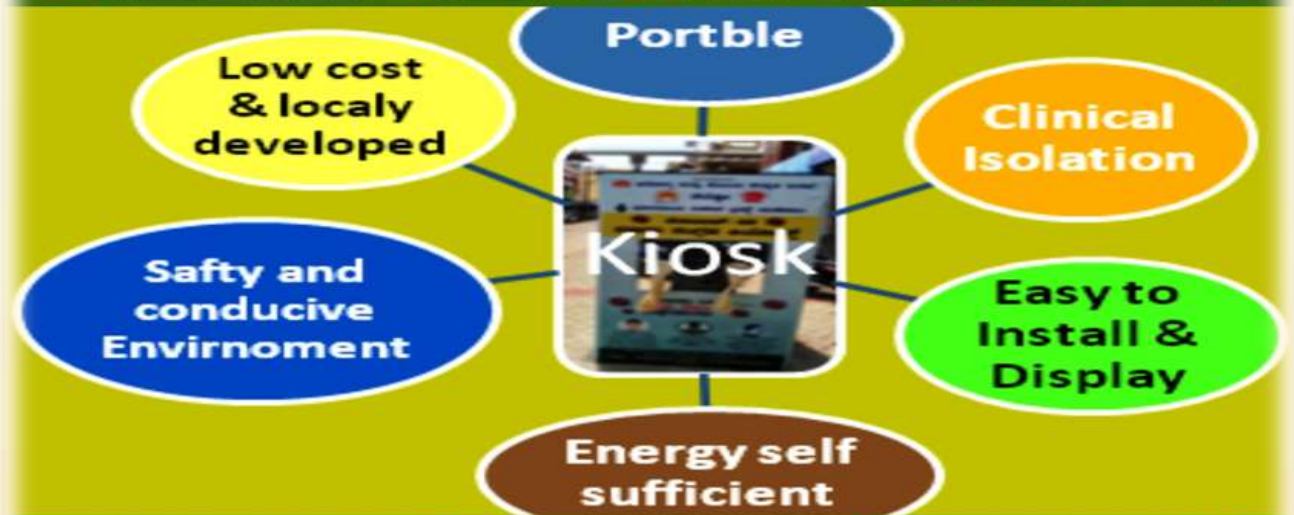


Narrative Report On

Low Cost-Portable Screening Kiosk- Response to COVID 19

June – August 2020



By

**BHARATHIYA VIKAS TRUST (BVT)
MANIPAL**

Sponsored by

SELCO FOUNDATION, BANGALORE



Final Narrative Report of the Project “ Response to COVID 19 – Low Cost-Portable screening Kiosk “ – June – August 2020

I. Background :

India is now one of the most and worst-affected countries in terms of novel coronavirus cases and the ICMR and the government say the rate of increase in coronavirus cases has stabilised but the stable number is not small. This calls for more testing to better ascertain the scale of Covid-19 outbreak in the country. This is where Indian government, health agencies and healthcare professionals fighting novel coronavirus pandemic in India feel constrained. There are not enough testing infrastructure , kits. Further, local production of testing kits is far behind the requirement. India is mostly dependent on import of kits, mostly from China, however due to faulty / inferior quality, the kits now have been withdrawn.



The corona swab collection and testing centres are far below the requiring rate as compared to expected / traced. The situation is uniform in most of the states including Karnataka. However with Govt. and Non Govt agencies efforts , the Karnataka’s testing capacity has gone up from 300 tests per day done till April end . However, gonging by the State’s plans of random testing and testing of Primary /secondary contacts, the State do not have adequate required infrastructure and also for further expanding testing activities as the need for such intervention will be increasing rapidly. Karnataka as of now has 17 laboratories with RNA-based PCR (polymerase chain reaction) machines. But the rate at which the disease is spreading, there is a need to further ramp up testing and the State is not well-equipped for that now , said sources.



II. Raison d'être : The Kiosk Efforts

In view of above there is an urgent need to crowdsource collection and testing facilities and infrastructure using local technologies and resources so as to minimum cost and availability in rapid time on a rampant testing scale which can help the government determine the actual number of cases. While the focus is on shortage of ventilators, we have not realised the shortage of such collection and testing centres / testing kits, and trained health workers/ technicians.



In this crunch time, to address the above challenges, we need to create an environment (where) innovation with indigenous resources / technologies just in time to meets the unmet need, by turning it into an opportunity which will weather the storm. India needs to ramp up swap collection and testing infrastructure and resources to fight this pandemic better.



In view of this , BVT under its response to combat against COVID -19 has submitted a project proposal to SELCO Foundation with a financial outlay of Rs 25.00 lacs for a developing a low cost swab collection Kiosk, testing / demonstration and scaling up the model . Accordingly after initial discussions and looking to the need & scope , SELCO Foundation has approved the proposal with a total grant amount of Rs 24.80 lacs for developing / scaling up of 100 innovative affordable / low cost simple mobile –fordable kiosk in association with SELCO for Swap collection and sample testing –COVID in association with SELCO under the guidance of District Health dept – DHO/ Taluka Health Officer which has demonstrated its optimum utility during this crunch time in optimum collection of samples at rural and needy location of the district.

III. Objectives :

Objectives :

Looking to the need and challenges of establishing adequate swap collection / testing faculties , cost effective and it's just in time availability, BVT in association with SELCO Solar has developed a tailor-made affordable – fordable swap testing Kiosks using local level technologies / resources under the guidance of Health dept. to ensure the envisaged standard and optimum collection efficiency to meet / enhance the collection and testing efforts of COIVD samples –a need of the hour effort.

Deliverables :

- > Looking to the need and nature of interventions, developing 100 swap collection such Kiosks and install at various districts / locations across Karnataka State to enhance the scale of the swap collection and testing effort.
- > Explore the possibilities to create decent livelihood opportunities for local micro- entrepreneurs/ fabricators , etc in developing such Kiosks.
- > Develop/ strengthen linkages with various developmental partners of the sector – Govt., Non Govt., Corporate , Health dept/ PHCs, Local donors, FIs , etc for association and convergence.

IV. Project Accomplishments.

1. Threshold stage

As per the implementation/ operational modalities, a need assessment of project interventions at the operational areas of project was made and examined the present status of collection & testing arrangements and facilities / infrastructure .

Towards this initial networking efforts & discussions were held with District / Taluka health depts, COVID nodal team / officer , health professionals and other partners and it was suggested that there is need to develop a simple Kiosk which is low cost simple design and can be manufactured locally and quickly and easy to deploy.

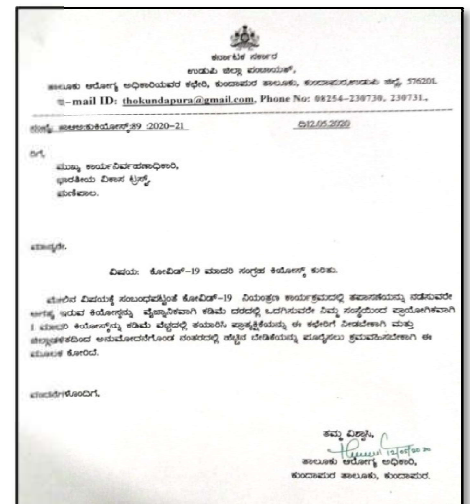


Based on the suggestions, different models were designed and a prototype of Kiosk made up of Rexene material was developed and tested. Based on the field test and the suggestions made by the Health dept , model was modified with appropriate structure material and design of the kiosk.



Based on the feedback and suggestions, keeping in mind it is essential to come up with an appropriate design for a such a Kiosk , BVT in association with SELCO has developed a low cost, portable model of Kiosks meeting all necessary safety and precautionary measures for collection of swap. The design and model was developed under the guidance ad in partnership with the District Health Officer, Udupi district.

Isolation: The primary design objective of the Kiosk was to come up with a clinical isolation between the potentially infected person and the health worker. The Kiosk has been designed to achieve this objective by bringing in a physical barrier so that the health worker never comes in direct contact with the infected person physically and clinically.

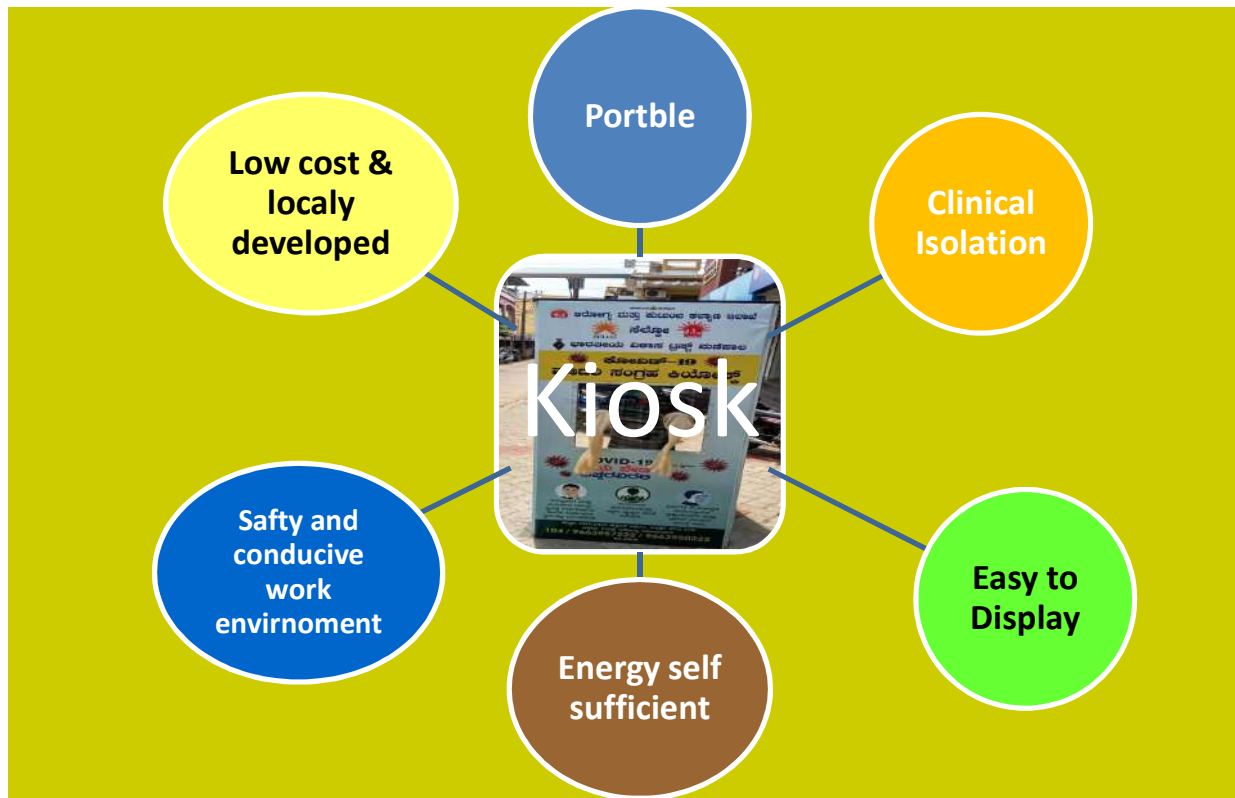


2. Growth Stage :

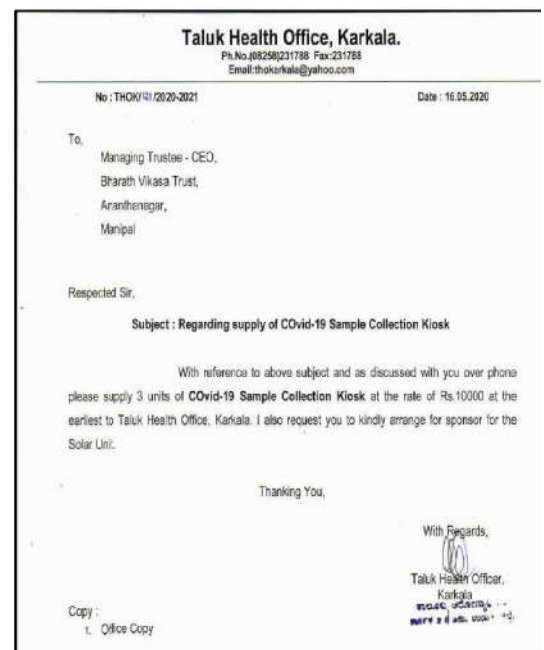
Development of Appropriate model of Kiosk- Affordable – Fordable Kiosk Model :

The designed kiosk is a small cabin made up of GI structure/ frame that is closed from 3 sides with one side having an acrylic transparent frame fitted to front wall with an opening fitted with surgical gloves for easy to test the swap from the suspected person. The size of kiosk of 3.5 ft X 7 ft size with acrylic transparent sheet of about 3ft attached with full surgical gloves for easy testing comforts.

The 3 sides of kiosk is prepared using the Backlit flex/ vinyl material of about 560-600 gsm thickness and FR B1 certification – fire and water resistance or can go for high grade Blackout flex material more than 600 gsm thickness with FRB1 certification for better strength and so as to neatly fit into the GI stature making the kiosk perfect and strong. Also by using either Blacklit or Blockout material the structure can withstand in the windy areas also.



The Front side is completely airtight and ensure the social distance level. The person being tested is seated outside the front wall through which two rubber gloves are attached outside to ensure that there is no direct contact between the health worker and the person being tested while collecting the samples. The health worker will insert a hand in the rubber gloves and collect swab samples and blood samples from the patients through a testing stick. The rubber gloves and the cabin is disinfected after each sample collection. The collected samples will be stored in a sample box with necessary suitable sterile container/ outer container (e.g., thermocol box, ice-box, hard-board box with aprpx dimensions: 10 x 10 x 10 cm which ensures temp of 4 °C for transport to nearest testing centre.





Covid suspected person will stand in front of the front acrylic counter from where the medical worker will collect the swab samples. The swab collection process will supposedly only take five minutes and is entirely contactless. The samples will then be sent to the nearest COVID-19 lab to be tested.

Energy self sufficient: Many of these Kiosks will be setup in places which are likely to draw floating population who needs to be screened. Also to maintain the need for isolation, the Kiosks will be at a vantage point from the point of view of reach and isolation. So it will not be easy to always ensure a connection to grid electricity. With this need in mind the Kiosk has been equipped with solar power to run light, fan, mobile charger and any other required equipments based on need.

The best part of the kiosk is that it is well equipped with uninterrupted power through Solar interventions to run fans ,light , mobile charging and small head light for screening. This will create a healthy working conditions to health workers who carry out the test and enhance the efficiency of testing work in a given time . We can also explore the power intervention for Storing the samples in small refrigeration container/ boxes which ensures temp of 4 °C for transport to nearest testing centre.

The envisaged energy intervention is carried out by SELCO Solar Pvt Ltd as per the design.

The Typical Kiosk consists of following energy interventions

Kiosk: 3.5x3.5x7 feet GI Frame Flex based wall Foldable & Surgical gloves - 2 pairs
Solar Module with mounting Structure - 40 Wp
Solar battery with Rack -20 Ah, 12 V
Charge Controller- 10 A, 12 V
Loads –Luminaries - LED Tube light 5 W 1 Nos - DC Fan 10 watts - Mobile Charging 5W & Charging sockets

The Unit is prepared under the guidance of Dist . Health dept and very useful for collection of swap at rural areas / PHCs where it is easy to install and uninstall after the swap collection .

At the initial stage, 3 kiosks were developed and installed at different locations- PHCs/ quarantine centers of Udupi dist. The responses about performance of kiosks were found highly encouraging and model was appreciated by District administration – DC, health dept, ZP and other concerned agencies.



District Collector of Udupi inaugurated and distributed Kiosks to different PHCs of Udupi dist.

Looking to the encouraging responses and need & scope for such interventions, it was decided to scale it up and extended the operational areas to other districts of Karnataka.

3. Development Stage :

Scaling up of Kiosk and installation at various locations/ Districts of Karnataka.

Towards this, apart from its own networking efforts, BVT approached SELCO Solar for scaling up of about 100 such kiosks and reaching other districts of Karnataka through its vast network . Necessary networking and discussion with local health dept was done through SELCO branch officials. Based on the discussion and need assessment, a request for number of Kiosks from respective Health dept/ DHS/ ZP / PHCs/ of various districts was received/ collected. Accordingly, discussions were held with local health dept/ PHCs and other officials for identification priority



locations for installation. The Kiosks were developed at different locations to make the ease the logistic and to create local livelihood opportunities.

As per the operational modalities and action plan, during the reporting period- July- Aug, all the 100 Kiosks were developed and installed at selected locations of the Karnataka State under the supervision of local health depts./ PHCs . All necessary installation completion certificates and documents were completed.



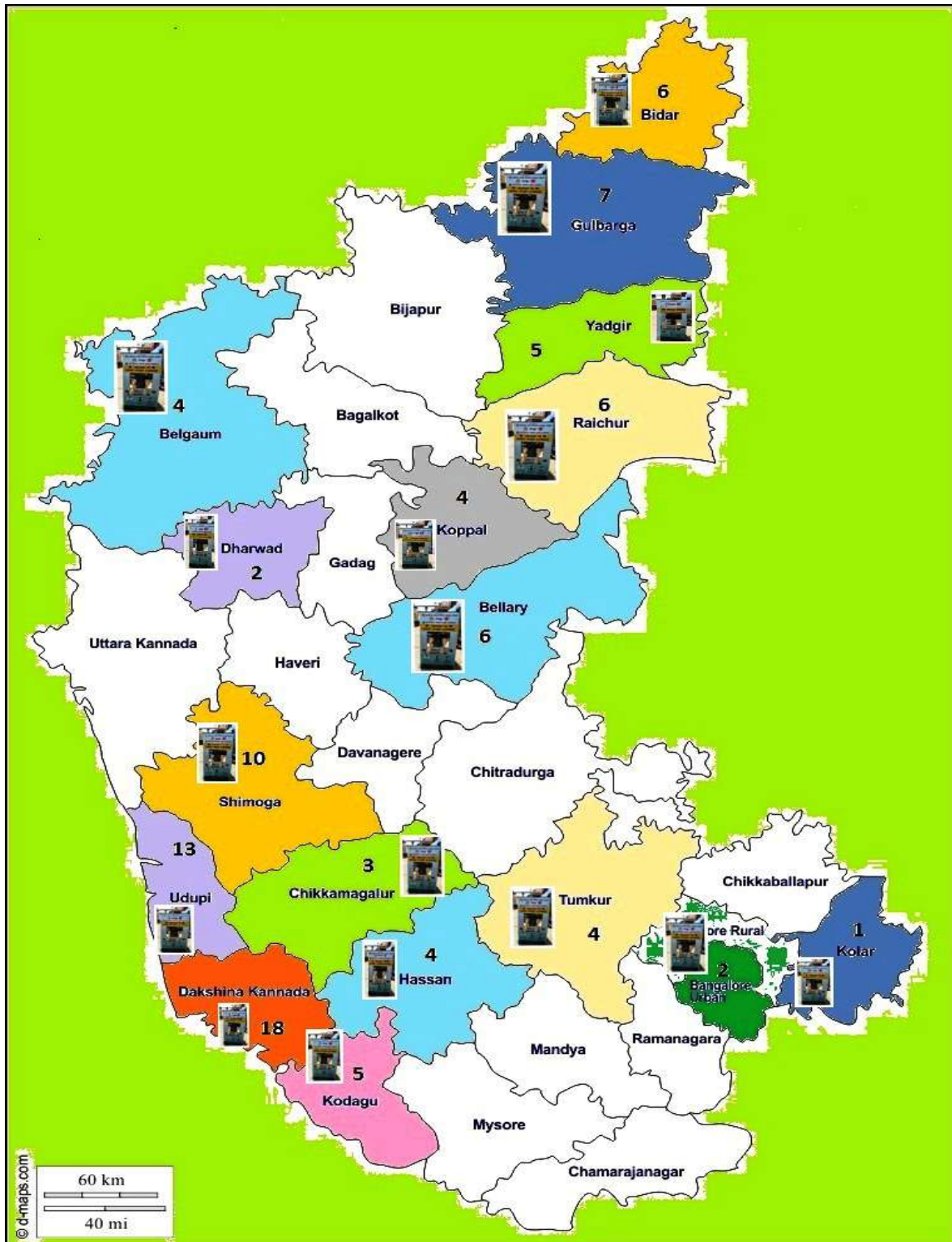
The developing and installation of Kiosks with envisaged solar interventions at the selected locations of districts of Karnataka is carried out through SELCO Solar branches network and a proper arrangements /linkage is made with SELCO Solar towards this.



We are getting encouraging responses about the performance of Kiosks and interim assessment has indicated that there is significant increase in the swap collection capacities of PHCs and also satisfaction of health workers in carrying out this collection work.

Sri C.T Ravi, Honorable Tourism Minister inaugurating and appreciating efforts of Kiosk at Chikkamagalur.

The district wise installation of Kiosks in depicted below



It may be noted from above distribution that the outreach or operational area is equally distributed region wise – Northern and Southern regions of the state. In other words, under this , we have

covered as many as 17 districts – 9 districts under Southern and Coastal districts of State and 8 districts under Northern districts of Karnataka. Under the scaling up efforts of project, based on the initial networking & discussion with local health depts. and need assessment, requests for number of Kiosks from respective Health dept/ DHS/ ZP / PHCs/ of various districts were received/ collected. Accordingly, the kiosks were distributed to selected districts of State

V. Interim Impact Observed-

A Prismatic View of impact (Quantitative)

As a part of the impact assessment and evaluation, serious efforts were made to collect feedback from concerned doctors/in charge or health workers of the PHC/Kiosk about key parameters of performance and satisfactory working of Kiosks. Through a simple and structure feedback form/questionnaire, the required responses were collected and then tabulated for analyzed to understand the interim impact / usefulness of the Kiosk program.

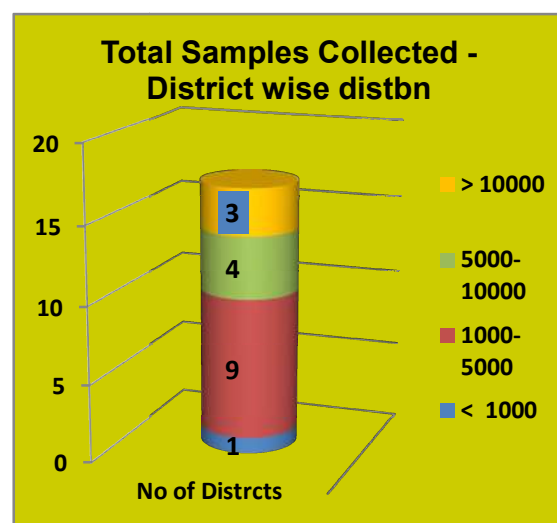
The assessment has provided some inputs about the working performance and usefulness of kiosks along with various other key parameters like – increased capacity and efficiency of swab collection work, conducive working environment for health workers to collect, easy to operate / user-friendly method, simple, cost effective and portable structure of kiosk, solar energy interventions, etc. Apart from this, the information was also collected from District/ Taluk health officers and other concerned officials of the district.

The feedback thus collected were then analyzed based on some key parameters to understand the interim impact of the project and is depicted below.

1. Increased Number of swab samples collected –

The information collected based on the total number of swab samples collected by all the 100 kiosks was reported to be about 89,700 during the reported period– July to Sept. The distribution showed that about 9 districts have collected samples between 1000 to 5,000 samples .

South/Coastal	Samples	Northern dists	Samples
Udupi	15910	Belgaum	3262
Dakshin Kannada	7737	Koppala	6840
Kodagu	1300	Bidar	1706
Shimoga	711	Raichur	10908
Hassan	5445	Bellary	1649
Chikkamagalur	4530	Kalaburagi	12510
Bangalore Rural	1200	Yadgiri	8000
Kolar	1050	Dharawad	2560
Tumkur	3693	Total	89011

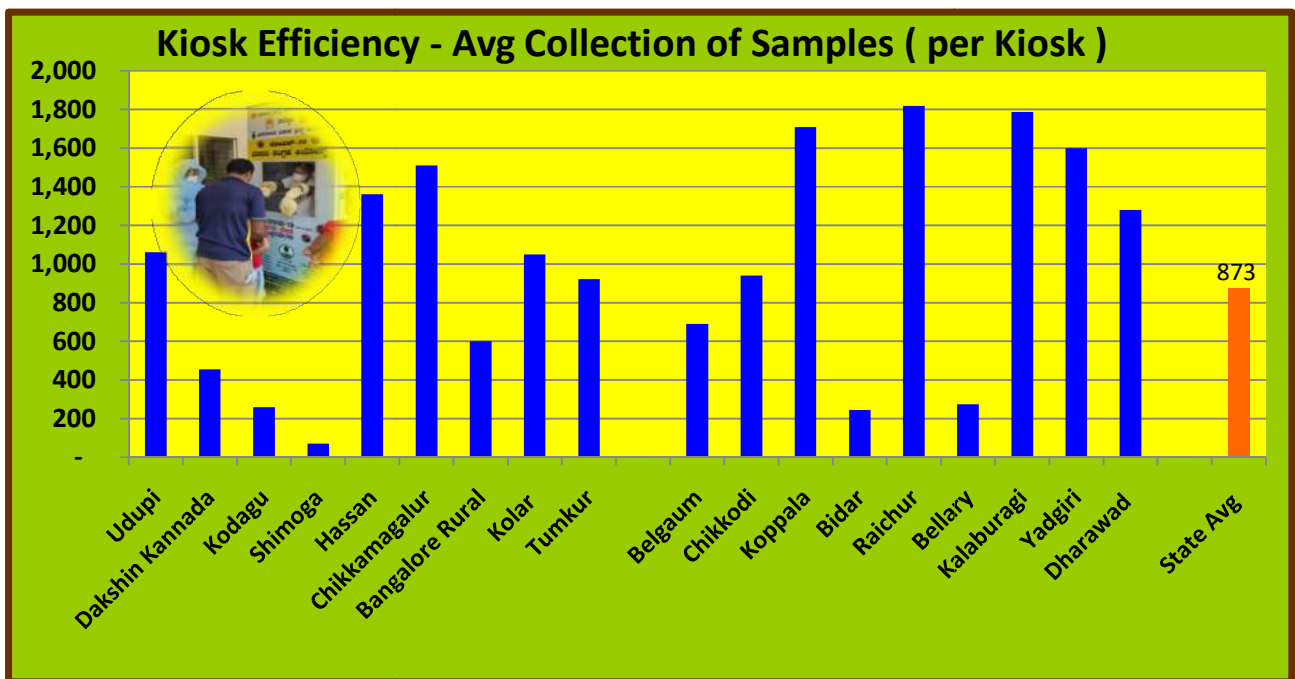


State COVID testing reaches about 5 Million

The above data showed that with this kiosk project, there is significant increase by 90,000 more swab samples collection over a period of 3 months by the selected PHCs and also by the State. This has significantly helped in identifying more and more COVID positive suspects and take necessary precautionary measures by local health authorities for treating the COVID infected persons at local level.

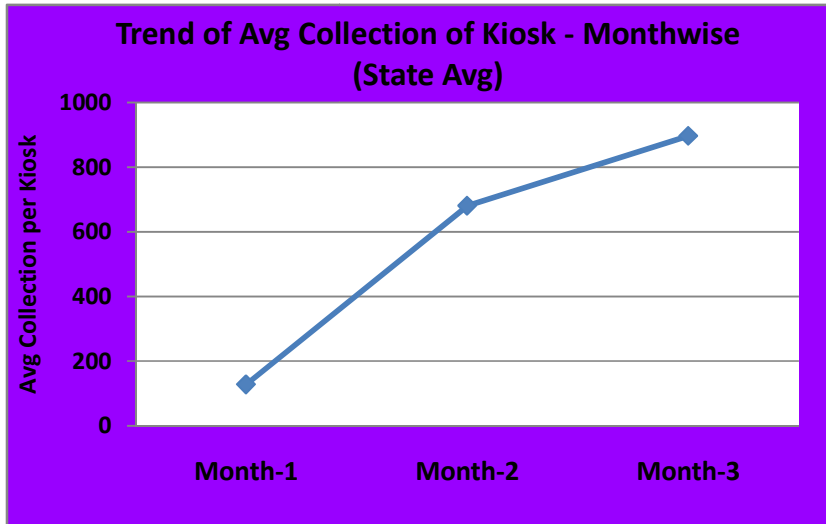


2. Kiosk Efficiency : Average Sample Collection (per Kiosk)



The analysis toward District wise collection of swab indicated that the overall collection of swab for all the 100 kiosk is worked out to be 873 samples per kiosk. Further analysis about district wise collection per kiosk showed that out of 17 districts covered; as many as 11 districts have showed average collection above the state average of 873. Northern districts dominated the parameter with Raichir – 1820 avg sample, Gulberga- 1787 samples, Koppal-1700 , Yadgiri- 1600 and Chikkamagalur - 1500 . The lowest was reported at Shimoga -97 and Bellary -240 avg samples.

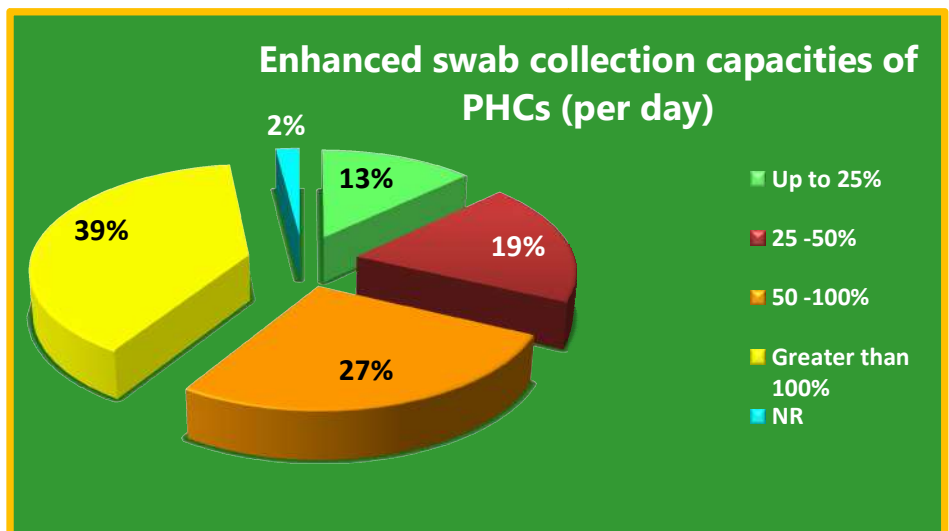
The month wise sample collection showed that there was an exponential growth rate of collection during months Aug (last 2 weeks) and Sept. This could be due to the various factors like Govt. serious measures & aggressive strategies of health dept –fixing targets per PHCs , Pro action taken by district authorities push for testing, policy interventions- lockdown especially during August & Sept , increase in SARI and ILI symptoms , awareness about COVID , etc



3. Enhanced Collection capacity of PHCs per Day - Before Kiosk Vs After Kiosk

Data on collection of samples before Kiosk and after Kiosk installed were collected and were analyzed. The per day increase in collection capacity of PHCs/ Hospital is summarized in table and same is expressed in percentage terms

From the chart it is clear that about 40% of the districts ie 40 districts have reported that their daily collection of swab capacities has increased by more than 100% as it was before at their PHC. In other words there has been significant increase-double in collection of Swabs after the kiosk installation which clearly indicate the encouraging impact of kiosk in its efficiency / swab collection capacities, better environment and satisfaction level of health



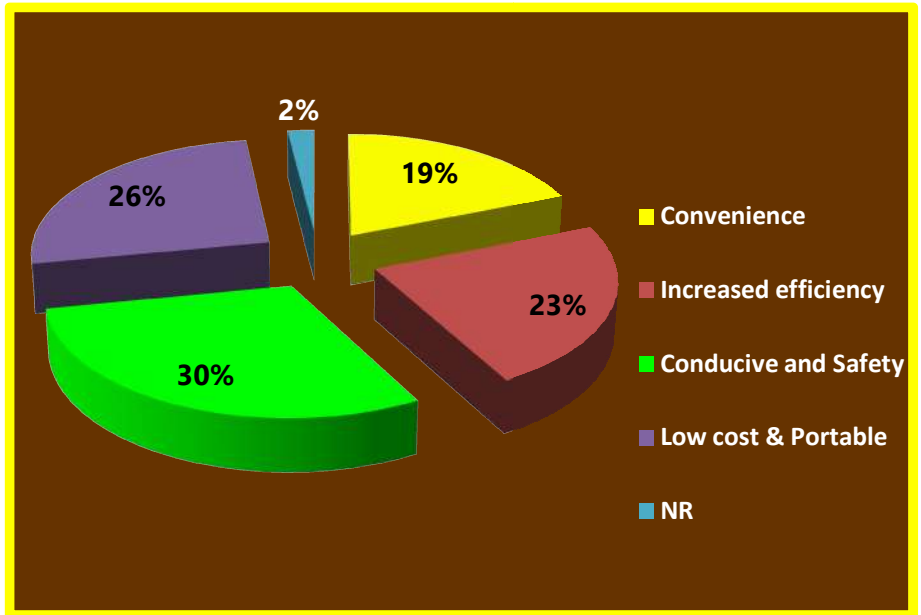
workers who collect at the PHC. However, one of the other influential factors could be Govt. / Health dept more aggressive approach, target for collections.

4. Health workers perceptions about Performance of Kiosk

Feedback also collected on perception of concerned in charge / Health worker /Doctor of PHC about their satisfactory , problems, suggestions about the Kiosk and analyzed .

The Kiosk is..... health workers responses.....

Very Useful	62%
Useful	35%
Not Useful/ NR	3%



5. Some Qualitative impact / observations

Some of the encouraging responses received from the concerned Doctors, In charge / health workers which will highlight the qualitative impact of the Kiosk program and are summarized below.

Kiosk program was found to be Just in time and need of hour initiative in enhancing collection - testing capacities of PHC/ Dist in more systematic and safe manner.

Reduced Time, Risk and use of Resources of PHCs for swab collection work- Optimum Utilisation of resources

- Opportunity to allocate / Utilise health workers for other important health services - COVID/ Non Covid

Economically Vaible and Tech. Feasible Soluton-

Reduction in cost of swab collection work which enabled in utilising resources in other priorities of health services of COVID -19

- Earlier, we use to incur considerable expenditure for collection of swab with huge risk elements. The approximate cost observed is Rs 50,000 per month for collection of bout 200-250 samples towards various components like PPE kits, manpower, facilities , Cleaning, etc.
- Now it is one time investment of Rs 25,000 with all necessary facilities and energy interventions for better working condition for swab collection work.
- The health workers also has no hessitation to work as more safe and easy working envirnoment at the PHCs

Easy to Set up and transport / Portable

- At some places it was reported that during lockdown phases /remigration there was sudden need for collection / testing of migrants/ passengers. Towards this, the Kiosks need to shift from one place to other within a short time. During these situations, the Kiosk was found very easy to shift and reset quickly at the desired locations to collect the samples.
- Also at some remote places , it was difficult for villagers especially special category – Child , aged, pregnant women, etc to travel to PHCs and get tested. Towards this the Kiosk , because of its stand alone & portability structure , was found to quick and affordable ideal solution for doing swab collection work at remote places.

The process and product demonstrated the business models for service providers/ entrepreneurs to venture into it and contribute towards disaster (health) management solutions of the country .

Unlocking Energy interventions at Health services / sector.

Sustainable energy as a best intervention or a spring board for Strengthening the health services especially during COVID pandemic and thereby creating a healthy and robust environment at rural areas through sustainable energy interventions.

VI. Suggestions of Respondent/ Health workers

The overall response of the concerned health workers about the performance and usefulness of Kiosk initiative is highly encouraging and it has really helped the PHC/ Hospitals to enhance their capacity of swab collection and reaching the targets of the district to the extent possible.

Some suggestions / feedback about problems, further improvements in structure, quality, materials used, utility, size, designs, etc were captured and were documented and important and feasible broad/ major suggestions are listed below.

1. Swab Collection boxes are provided and need more space for keeping these boxes in the Kiosks .

A thermocol box, ice-box, hard-board box Box/outer container for Swab specimen Sample vials and Virus Transport Medium (VTM) are to be kept in Kiosk for which there should be a separate tray or provision for keeping the boxes.

The energy interventions could include to ensure the stipulated temp of freezing the sample storing box instead of thermocol box, ice-box, hard-board box Box/outer container

2. Provision for Kit tray to keep Kits and necessary materials for swab collection work-

Tray or storing facility for keeping various materials like adsorbent material (cotton, tissue paper), paraffin, seizer, cello tape, Hard-frozen Gel Packs, ziplock pouch, cryobox, centrifuge tube, plastic container, Other kit samples, etc.

3. Need better quality and larger size surgical gloves to carry out swab collection with more conveniently and hassle free.

The position of hand holes gloves at the front side of Kiosk need be adjusted / lowered so that the health worker could carry out conveniently and hassle free.

4. Include an automatic sanitize sprayer so as to ensure more protection and disinfection process.

As per SOP of swab collection of MoHFW, after collection of sample, one needs to sanitize the Kiosk and surrounding areas to ensure they are safe and clean. Towards this, built-in automatic sprayer powered by solar energy will be very useful and help in enhancing the collection capacities of PHCs with a more safe working environment.

5. Folding door can be provided at the backside to cover Kiosk .

6. **Proper good quality battery storage box can be provided to ensure protection / safety measure inside the kiosk.**

7. **The overall design , structure is appreciable but could have made better by using better & strong flex material/ plywood, acrylic sheets , strong base structure , etc so that it can withstand even during serious windy and rainy seasons.**

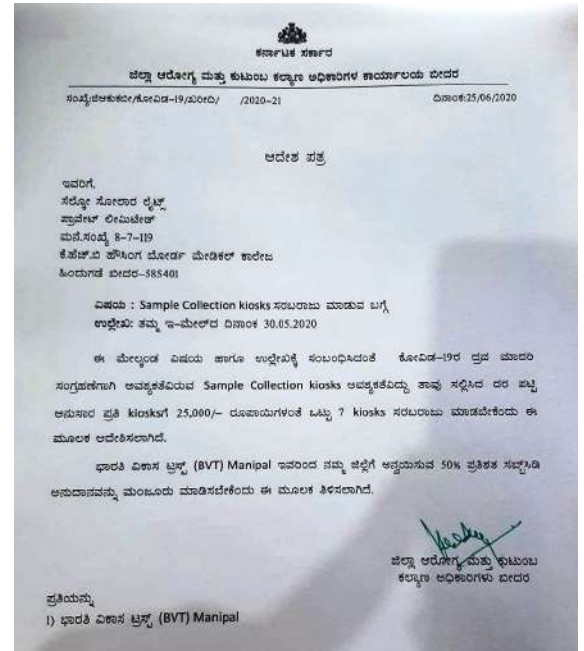
VII. Way Forward :

Strengthening / Up-dation of Model for sustainability :

Looking to the encouraging responses and impact, efforts were made to scaling up further with modified project implementation strategies based on the experiences of projet implemented.

Under this, looking to prevailing situation of COVID testing efforts, there is an urgent need for multiplying such interventions. Towards this based on instructions received from State Heath depts., several enquires / request are being received from various local health depts., PHCs of State.

However , based on the initial discussions & networking meetings with district health / administration authorities, the project implementation strategies and support mechanism are being modified and effort will be made to continued/ implement the project on a self financing business model with mobilizing contribution / resources from various stakeholders . Suitable cost sharing models are being finalized and implemented accordingly with nominal grant component support.



Model integration – Low cost Fever Clinic Cum Kiosk :

3. Utilizing the experience and learning from the project, the model / design will extended to establish low cost Fever clinics Cum Kiosk at rural areas/ PHCs .

COVID-19 Model Fever Clinic Cum Kiosk at Primary Health Centre , Basrur ,, Udupi dist.

Looking to the need for establishing more number of fever clinics and based on the request received from Health dept , Kundpaur, a Fever Clinic Cum Kiosk is established at Primary Health Centre, Basrur, Kundapur Tq, Udupi.

Basrur PHC is more than 60 years old and is one of the old centers of Kundpaur which has sound camps and old building. The PHC covers 4 surrounding villages. However, the PHC lacks in necessary infrastructure like sufficient rooms/ facilities to take up testing and collection of swap separately.

In view of this and after initial discussion with Tq health officer and the PHC doctor, a need based tailor-made Fever clinic cum Kiosk was established at PHC Basrur. The clinic was established in PHC by utilizing local resources and converting the outer portion / room of the centre .

- Apart from separate room for fever clinic testing for SARI, ILI and other normal symptom persons , the outer portion of the PHC was modified and converted into a testing and swap collection Kiosk using the same design Kiosk model.
- Necessary fabrication and modification of the Window structure is done as per design to carry out the functions of Clinics hassle free.
- The front side is completely air tight inside and outside and highly protected by the COVID . All necessary IEC mater of COVID is printed.
- A power operated Sanitizer sprayer is fixed at the Chamber to sanities the chamber after testing / collection regularly.
- Different layouts are marked Green and red zone and Yellow Buffer zone will be marked to classify the different category of patients.
- A Separate entry and exit is provided to the testing area to take care of necessary guidelines, safety and precautions.
- The best part of the Clinic is that it is well equipped with uninterrupted power through Solar interventions to run fans ,light , mobile charging and small head light for screening. This will create a healthy working conditions to health workers who carry out the test and enhance the efficiency of testing work in a given time . Also exploring the power intervention for Storing the samples in small refrigeration container/ boxes which ensures standard temp for transport to nearest testing centre.

