

## Battle with COVID19: SLINTEC's story of uncovering opportunities through a pandemic

Lakshitha Pahalagedara

*Sri Lanka Institute of Nanotechnology*

December, 2019 is a haunting month not only to the people in Wuhan, China but also to the entire world. COVID19 was first identified in Wuhan, however it started spreading so fast in almost all the continents and became the defining global health crisis of our time. It has posed great challenges to the world economy and people's daily lives and will have far-reaching consequences beyond the spread of the disease. We're yet to see its major consequences, which have to be identified in terms of both measurable and unmeasurable damage. These adverse effects would not just be economical but also social and psychological, and they will last for decades letting entire sectors of economy collapse causing serious potential implications such as changing consumer behavior and purchasing patterns. It has been predicted that 50% people will spend less, buying only what they need. New habits will also emerge through technological advances and new ways in which consumers have learned to cope with work, leisure, and education. However, food, household supplies, personal care items, and home entertainment may not lose its grip while new markets, mainly focused on the healthcare would be created. In Sri Lanka, the economic behavior is almost similar to the global state of affairs. However, as a nation which is focusing on growing its exports after suffering through a long term conflict, and also as a country which is still struggling to bridge its import-export gap due to the huge amounts of imports which is two times the value of the country's total exports. COVID19 brought adverse effects on almost all our major export sectors including tea, readymade garments and rubber etc. During the lockdown period which lasted more than two months, the entire production within the country stood still; but it also put the healthcare sector at center stage with unparalleled demand for diagnostic tests, personal protective equipment (PPE), and other critical medical supplies.

Sri Lanka Institute of Nanotechnology (SLINTEC) was established in 2008 in order to uplift the high tech and value added production in the country by assisting

the local industries to serve both local and international market needs. From its inception, SLINTEC has mainly been focusing on doing R&D in areas that are relevant to the country's economy. The major research areas of SLINTEC are sustainable agriculture, smart textiles, coatings and composites, medical diagnosis and preventive medicine and printable electronics and sensors. Out of these research areas, the first three were greatly disrupted by COVID19 during the lockdown conditions and even after that (not during and post-COVID, as we're yet to define the post-COVID period), as the market is still not ready to accept large amounts of these goods. However, the story in the agriculture might change in a positive way as there will be a great need to produce food within in the country to face situations such as COVID19. As private enterprises were struggling to keep their businesses afloat while the government was busy with controlling the spreading of the disease and providing financial aid to protect the local enterprises, it is natural for one to assume that there was no way of surviving for a public-private research institute like SLINTEC.

SLINTEC, being a science based research institute, is highly human resource-dependent and operated on a hard-to-digitalize environment. Hence, SLINTEC had to go through all the challenges from getting curfew passes to arranging transport for employees during the lockdown. As a research institute, which is not fully supported by the state through a funding mechanism, SLINTEC faced (is facing) the pandemic situation by taking two specific approaches; one considering the immediate requirements and the other considering the long term requirement by both the local and international market. Out of these two approaches, the first approach was put in to practice during the peak of COVID19 in Sri Lanka during the initial phase of the lockdown. At the early stages of pandemic, SLINTEC identified that there is a great need for the country to do tests for COVID19 as much as possible in order to prevent it from being spread across the nation. SLINTEC identified that

there was a shortage of specimen collection devices due to high global demand. SLINTEC did not stop by just identifying the problem, instead our scientists were able to reverse engineer the technology and meet the country's requirement by producing COVID19 swabs in large scale with the collaboration of Medical Research Institute (MRI) and a few private entities. At the same time, SLINTEC started developing an antimicrobial coating which can be applied on any surface (walls, wood, glass, paper etc.) and it is currently being tested for its antiviral activity in the UK.. The most recent success story of this development was launched on the 18th September, 2020 where we collaborated with Atlas Axilia Co. (Pvt) Ltd. to apply the coating on a stationary product range that includes exercise books, pens etc. One of the most important initiative that SLINTEC took as an immediate response to the situation was to develop a fast and cost effective substitute for the RT-PCR (Real-time polymerase chain reaction) technology which is considered as the gold standard to detect COVID19. The new technology is named as LAMP-PCR (Loop-mediated isothermal amplification polymerase chain reaction) and it gives results much faster compared to RT-PCR. SLINTEC is currently conducting clinical studies with the help of University of Sri Jayewardenepura. This initiative will not only grab the attention of local authorities but also being recognized globally. Also, with the increase of various types of masks being produced in the country, SLINTEC created a mask testing facility to standardize the quality of masks coming to the both local and international market.

In the second approach where we expect to come up with innovations focusing on their long term impacts, SLINTEC is mainly targeting the fields of agriculture, textile and, healthcare in terms of preventive medicine. SLINTEC is currently developing a digital soil test kit to detect main components of soil and a nitrogen-user-efficiency-improved fertilizer. Also SLINTEC initiated a project to use Sri Lankan rock phosphate as a substitute for triple super phosphate (TSP). These innovations this will help to control the amount of urea usage and will help reduce the dependency of fertilizer being imported. On the other hand, SLINTEC is focusing on projects related to textile and apparel, mainly focusing on incorporating antimicrobial properties. Also, SLINTEC partnered with a leading garment manufacturer to develop a detachable mask sensor which would detect the breathing patterns and notify the wearer when the mask is no longer safe to use. SLINTEC also initiated a few projects to find the possibility of using nutraceuticals as a preventive medicine for deceases such as COVID19.

Considering the activities taking place at SLINTEC, it is very clear that these initiatives definitely have a strategic approach to enhance SLINTEC's core business of R&D. However, it should be noted that these are not just initiates which were taken by considering only the commercial aspect. As a high tech national research institute, we have always considered our social responsibility to serve the country in terms of innovations when it is needed more than ever.

*Dr Lakshitha Pahalagedara obtained the BSc from the Faculty of Science, University of Peradeniya, Sri Lanka and PhD from the University of Connecticut, USA. He is the Head of Business Development and a Senior Lecturer at Sri Lanka Institute of Nanotechnology. He is also a member of National Innovation and Entrepreneurship Steering Committee.*