



High Education and Research for Clean energy Technologies project



Collaboration between the University of Jaffna (UoJ) and Western Norway University of Applied Sciences (HVL)

Annual Report for the Year 2019

Executive Summary

Almost all the activities planned under the project were performed without any deviation, and the project also resulted in number of synergistic effects. In a short span of time, Project has achieved most of the goals of the project, and research consortium has been widely expanded beyond expectation. Two new Master curriculums on Clean Energy Technologies at UoJ were jointly developed by UoJ and HVL, and the curriculums have got the approval from the University Grant Commission (UGC) in 2019. Nine Master/PhD research students are recruited at UoJ and UoP, and one new PhD scholar from Sri Lanka is recruited to carry out in-depth analysis of energy transition and energy policies in Sri Lanka. Seven research students receive stipend from the project. A new research group on modelling of nanomaterials for clean energy applications is established at UoJ with the help from HVL, and this research group is the first of this kind in Sri Lanka. It is expected that establishment of the simulation group will lead to the enhancement of research collaboration with other institutions in Sri Lanka who are in need for the simulation competency. Although research student was supposed to start in the position in January 2019, but due to practical issues the research fellow Nanthini Nagarajah started her position from April 2019. She has been working on fulfilling the demands to carry out PhD in Norway by taking different courses and attending seminars at HVL. As part of the study Nanthini has had a field work in Sri Lanka for four months from November 2019. She is currently working on writing an article on ‘Understanding the Renewable Energy Transition in Sri Lanka’. The dissemination activities of the project have been on the increase in 2019, and a total number of 20 publications, including 10 research articles in high impact international journals have been published so far.

Northern province has experienced alarming down fall trend in STEMM (Science, Technology, Engineering, Mathematics and Medicine) education at school level. To promote STEMM education in northern province, a pre-conference discussion forum was organized at UoJ and over 120 participants including educators, administrators, researchers and representatives from government and NGOs participated. A project group was established and number of recommendations along with an active plan were proposed and delivered to the Governor of Northern Province through the Hon. Norwegian Ambassador to Sri Lanka.

An international conference on Advanced Materials for Clean Energy and Health Applications (AMCEHA 2019) was arranged under the projects in February 2019 was attended by over 400 researchers, including 120 from 13 foreign countries. This was the first time that so many researchers from national and international delegates participating in an international conference in northern province in Sri Lanka, and AMCEHA 2019 received wide attention from both written, visual and social media. Many scientists from south visited for the very first-time northern part of the

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country that has led to more understanding between the scientists working in the field from different communities of Sri Lanka. AMCEHA 2019 has helped in establishing new networks between the national and international research groups. As a result of this conference, three different collaborative research proposals are submitted, one in Sri Lanka, other in India and Sri Lanka together, and the third in Norway. Publications and presentations at conferences and workshops have helped the research students and staff involved in the project the much-needed exposure to the international research environment and receive wide recognition for their research activities. In 2019, two new MoUs were signed under the project, one between HVL and National Institute of Fundamental Studies (NIFS) and the other between UoJ and GEXCON, a private Norwegian enterprise. Both agreements are expected to expand and strengthen the research consortium and help to involve the industry more in mentoring and research supervision. In 2019, HVL and UoJ have had number of Meetings and discussions with the private sector in Norway to initiate Sri Lanka's first floating solar PV plant in the premises at the Kilinochchi campus of Univ. of Jaffna. This has resulted in funding of a pilot floating solar PV project from the private industries in Norway. HVL and UoJ have had number of Meetings with the authorities in Sri Lanka to persuade them to give permission for this pilot project, that will be used for research purposes by both UoJ and HVL.

International conference on Advanced Materials for Clean Energy and Health Applications (AMCEHA 2019)

<http://conf.jfn.ac.lk/amceha/>



UoJ and HVL have also had outreach activities in both Northern and Eastern provinces of Sri Lanka and in Bergen in order to promote clean energy technologies. More than 500 school students from 17 Educational Zones of 3 districts in Eastern province of Sri Lanka benefitted from the clean energy workshops organized under the project at the Eastern and South Eastern Universities. Under the project the research activities were disseminated at several public events including at two SHILPA SENA EXPOSITION-2019 events, in Colombo and Polannaruwa, Sri Lanka. Number of outreach activities were arranged in Bergen, Norway under the project in order to inspire the school children in Bergen on emerging clean

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energy technologies where the Research students from UoJ actively contributed. All these activities received public attention through media coverage. Especially, the activities related to Forskningsdagene 2019 arranged in Bergen got much visibility through the news media such as TV2.

SHILPASENA – 2019 at Polonnaruwa



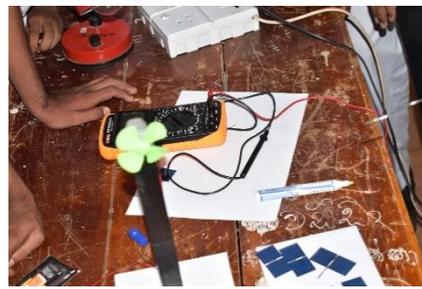
SHILPASENA – 2019 at BMICH, Colombo



Solar Awareness Program at Eastern University



Solar Awareness Program at South Eastern University



National Annual Solar Eclipse – 2019 observation camps organised at the University of Jaffna and the nation-wide activities arranged related to the solar eclipse were well attended by school children and the general public. Over 5000 participants from all parts of Sri Lanka attended these events in Jaffna and Kilinochchi. Most of the participants were first time visitors to Jaffna, and the event contributed to more understanding between the communities in Sri Lanka. The nation-wide media coverage of these events has given the project more visibility and high recognition.

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National Annual Solar Eclipse – 2019

<http://event.jfn.ac.lk/eclipse/>



Mobility of Research students between the institutions involved in the project were carried out as planned, but the visits of private and university sector representatives in May/June 2019 had to be cancelled because of the attacks in Colombo in April 2019. This event had also hindered the visit of staff and students from NIFS, Sri Lanka to HVL that was planned to take place in the summer months of 2019.

The research consortium has been strengthened throughout 2019 including new members from institutions and private sectors from Sri Lanka and Norway. Quality of mentoring and supervision of Research students have been improved, and this has resulted in more innovative research and dissemination activities in the field of clean energy technologies. Overall, the project progress in 2019 has been very good, and the project has had a lot of synergistic effects including establishing and strengthening new academic and industrial partnerships. All the activities in the project in 2019 have contributed to capacity building at UoJ, and we expect the project to have a big impact on the ranking and recognition of the University both nationally and internationally.

Output of the project

- Creation of a sustainable clean energy consortium consisting of educational and research institutions and private sector from Norway and Sri Lanka

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- Involvement of expatriates from Norway in knowledge transfer from Norway to Sri Lanka through visiting lectures, technical assistance and workshops
- Successful completion of PhD research study at HVL on in-depth analysis and policy formulation on clean energy in Sri Lanka and Norway
- A high quality laboratory facility at UoJ that can be utilized by the researchers in Sri Lanka for synthesis and characterizations of nanomaterials
- Improved quality in research
- Skill and knowledge development of the staff from UoJ
- Private enterprise involvement for new innovation ideas; collaborative projects which solve technical challenges faced by the relevant industries
- Increased involvement of enterprises in Bachelor/Master/PhD innovation and research projects.
- Sustainable participation of expatriates with expertise in technology in new industrial partnerships

Impact of the project

1. Successful development of Master curriculum in Clean Energy Technologies
2. Two recognized Master Curriculums at UoJ recognized by University Grants Commission of Sri Lanka
3. Successful recruitment of 2 PhD students and 5 Master students
4. Joint supervision of students at both HVL and UoJ
5. New MoU was signed between the Norwegian company GEXCON and Univ. of Jaffna in order to train the staff and students on fire and explosion safety.
6. A new MoU was signed between HVL and National Institute of Fundamental Studies (NIFS), Sri Lanka in order to promote research collaboration between the two institutions
7. Three research articles published in international journals with high impact factor in 2019
8. Establishment of a new Clean Energy Research Lab (CERL) at UoJ with high-tech equipment
9. Capacity building at UoJ through lectures, seminars and training
10. Expatriate (Norway) and partner University (India) involvement in capacity building at UoJ

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11. Successful visit of high delegation consisting private sector and academics from Norway to Sri Lanka and meetings with the counterparts
12. Clean energy research seminar in Colombo for over 100 participants
13. Involvement of the private sector in establishing research consortium for clean energy technologies
14. Involvement of private sector in mentoring students at UoJ
15. Training of 80 teachers in clean energy technologies
16. Outreach activities in clean energy technologies for over 500 students from 17 Educational Zones of 3 districts in the Eastern province in 2019.
17. Publishing Handbook on Clean energy technologies
18. Installation of first floating solar plant in Sri Lanka by the Norwegian private sector
19. High level of media covering
20. New partnerships between HVL, UoJ, UoP, NIFS and the industry
21. Mutual understanding and partnership among the research community with multi ethnical and religious background is established
22. University of Jaffna's reputation has grown positively through this international collaboration
23. Increased number of joint research articles
24. New partnerships and project applications

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