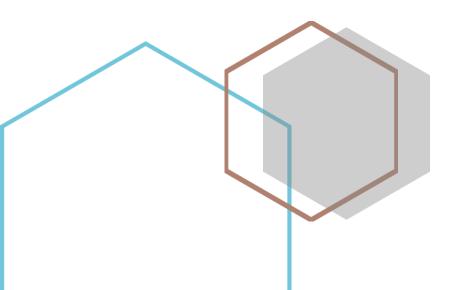


UNIVERSITY PRIORITY SETTING REPORT FOR THE PROVISION OF RESEARCH AND EDUCATION

UNIVERSITY OF PERADENIYA, SRI LANKA

Integrating Talent Development into Innovation Ecosystems in Higher Education 586227-EPP-1-2017-1-BG-EPP





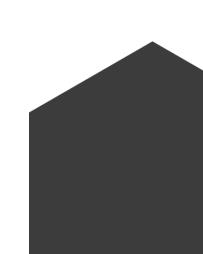




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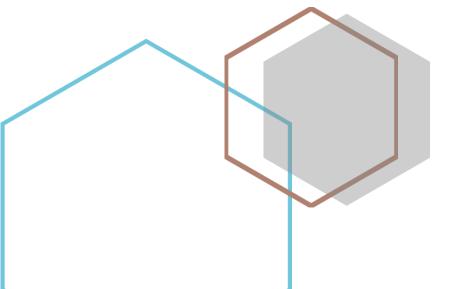
This report seeks to map priority areas for research and education provision at the University. It aims to provide a vision on how the institution can develop further to become innovation and skills provider for its region and locality, and how students and graduates should be involved in this process.

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University of Peraeniya

University priorities for research and innovation targeted at the economy and business enterprises





CURRENT STATE OF RESEARCH AND RESEARCH PRIORITIES University of Peradeniya maintains is a research hub within the country. It provides the ideal platform for multi-disciplinary research having 9 Faculties and 3 Postgraduate Institutes of study within it, with over 12500 undergraduate students, 8500 postgraduates, 850 academic staff members and 3000 administrative staff members. This allows the University of Peradeniya to host multiple international events, with over 20 large scale international conferences held through 2017 alone. The University's location ensures that scholars from all parts of Sri Lanka can attend and so research activities achieve maximum reach.

The nine Faculties at University of Peradeniya carry out multidisciplinary research activities that are unique and these are in the form of academic (undergraduate and postgraduate) research, research addressing national priorities of the country, and large scale research involving public-private and multinational partnerships. Such partnerships involve a combination of knowledge from subject experts and cutting edge technology where applicable. In addition, the International Affairs Office is dedicated to promoting research at both national and international levels by facilitation through academic programs and providing the students and staff with resources, scholarships and required platforms. This aids students to gain international experiences whilst enhancing the global visibility of University of Peradeniya. Currently, there are several initiatives of University of Peradeniya which target business and entrepreneurship.

For example, the Faculty of Management at University of Peradeniya carries out research which involves business and entrepreneurship as a component, in connection with other Faculties, such as Faculty of Science, Faculty of Agriculture and Faculty of Veterinary Medicine and Animal Science. It is expected that this will open up and help discover new avenues for potential business and enterprise opportunities in a number of different fields.

Agriculture contributes to about 7.5% of the national GDP of Sri Lanka, with over 30% of people employed in this sector. Agro value added industries can reduce imports, generate jobs and increase rural incomes. The colossal waste of agricultural produce must be stopped and suitable value added industries must be developed. Both large and small-scale industries can be boosted if the necessary R&D is performed and effectively transferred to entrepreneurs, especially in the rural setup. Thus, University of Peradeniya priorities for research and innovation are focused on this area with regard to business and entrepreneurship.

The Department of Agricultural Economics and Business Management of the Faculty of Agriculture was established in 2003. This Department offers comprehensive courses which include principles of economics, agricultural marketing, business creation and management, applied agribusiness, project analysis, marketing management, resource and environmental economics, quantitative techniques in business and economics, business psychology, research methods for business and economics etc. Consultation and evaluation activities are carried out by





the academic staff that possesses a broad background of experience and training. They serve as consultants in studies on irrigation, integrated rural development, tree crop, etc. for various Ministries of the Government and international organizations. These studies contribute to the improvement of the national and international development programmes.

The Department of Agricultural Engineering at the Faculty of Agriculture conducts state of the art research on developing technological inputs for the agriculture and allied sectors. The Department carries out research on integrated water resource management for many years with international partners, and is a partner of the Cap-Net – an international water related capacity building network. In addition, energy and waste management, postharvest technology, agricultural mechanization and automation are major fields of research in the Department. Student research is linked to industries, farmers or other organizations as the outputs are directly applicable in the field

University of Peradeniya also started its Agricultural biotechnology Center (AgBC) via the 2003 Asian Development Bank (ADB)-sponsored Science and Technology Personal Development Project (S&TPDP) of the Ministry of Science and Technology, Sri Lanka. AgBC provides a multidisciplinary environment for research by creating linkages with the scientific community, state-of-the-art research laboratories, research institutes and inviting the private sector to contribute towards biotechnology and related programs. AgBC's major facilities include Molecular Biology Laboratory, Plant Tissue Laboratory, Microbiology Laboratory, Microscopy facility and Green House Technology. Currently, these facilities are further enhanced, and new facilities are being added with the assistance from various partners.

AgBC also offers workshops, training programs and "hands on experience" to the scientific community to develop skills in latest techniques in the field. AgBC expects to expand its research and training facilities to cater for the growing demand in both the Country and in the Region. Thus, AgBC will be uniquely positioned to train the right manpower in conducting safe molecular biology research, to help companies start and succeed, and to help scientists interface with industry in order to help the biotechnology industry grow into a large and mature one.

The Agribusiness Centre (ABC) is the main outreach arm of the Faculty of Agriculture of the University of Peradeniya. This center is a national giant in providing contract research and consultancies on multidisciplinary agri-technologies. It currently excels in the area of improving quality of rice, which is the principle staple food in Sri Lanka. Very recently, the center conducted acceptability trials of micronutrient fortified rice by the local communities as a project funded by the World Food Programme. Its results will lead to a national policy on micronutrient fortification in the country. Linked to this, is the





innovation on bio fertilizers by using Nitrogen and Phosphorus solubilizing bacteria which had been selected for commercialization. Another commercialization process is in place for improving quality of tea brew by changing the physical properties of tea particles. Also research on grain processing and milling, and research on processed products in dairy and fishery industries are currently underway.

In Sri Lanka, many farmers depend on animal husbandry for their livelihood, but not a large proportion. Therefore, many livestock products have to be imported. The main livestock products in Sri Lanka are milk, meat and eggs. Hence, animal husbandry plays an important role in the rural economy for improving the living conditions of farmers in the country.

The Faculty of Veterinary Medicine & Animal Science imparts knowledge of all aspects of animal health and production and includes the study of Pet Animals, Livestock, Wildlife and Aquatic species. The research activities encompass large area of interests covering improvement of farm animal production and health, control and diagnosis of zoonotic disease, well-being of the pet animals, production and health of the aquatic animal species, alleviation of human wild animal conflict and quality assurance of food of animal origin. The studies conducted at the Center for Aquatic Animal Disease Diagnosis and Research of the Faculty are mainly on the bacterial and viral pathogens affecting the aquatic species. Quality assurance of food commodities, particularly those of animal origin, through monitoring of residues and bacterial pathogens is another focus; the activity of which has been nationally recognized.

As of recent, a new collaborative research laboratory QBITS was declared open at the Faculty of Science. It was setup as a public-private partnership to undertake research and development projects in novel technologies including Nanotechnology, Artificial Intelligence, Power storage etc. This is a pioneering effort to promote involvement of private sector to collaborate with the University to strengthen the Sri Lankan economy through state of the art industrial innovations and product development. This enables researchers to collaborate with this facility to scale up their innovations to industrial and product development level.

The Faculty of Allied Health Sciences was recently established at University of Peradeniya, and is the only such faculty in Sri Lanka. The faculty conducts B.Sc. degree programmes in Medical Laboratory Science, Nursing, Pharmacy, Physiotherapy and Radiography/Radiotherapy. Several departments have established active foreign collaborations in teaching and research. The Faculty is in the phase of developing research and innovations targeted at economy and business, and expects to diversify its contribution in the future. For example, collaborative interdisciplinary research is carried out on custom made orthopedic prosthesis. Also, the faculty is conducting research on bioactive compounds in Sri Lankan tea together with the Tea Research





Institute to combat national issues on health.

It is essential that policymaking at national level should also focus on the role of education, research and innovation in business and enterprises. Academics who are professionals in the field of Economics at the Faculty of Arts at University of Peradeniya are actively contributing to achieving this task. They are also involved in creating awareness amongst the public and State officials regarding these issues.

The Faculty of Medicine at the University of Peradeniya is one of the leading medical faculties in Sri Lanka with research medical laboratories with "state of the art" technology and globally renowned, highly accomplished medical researchers, scientists and clinicians with international collaborations. Its innovation and research involves finding unique solutions to some of the medical issues in Sri Lanka which are of national importance. For example, the Faculty of Medicine collaborates with the Faculty of Science in determining antimicrobial activity of natural products, including decoctions used in Ayurveda in establishing the uses of natural products in Sri Lanka. This can open up new business opportunities and create high-value products when such research outcomes are commercialized. Another innovation is the novel antivenom against the commonest snake bite in Sri Lanka, the Hypnale (Hump nosed viper) since imported anti-venom causes life-threatening side-effects. Also, cost effectiveness in relation to diagnosis of an infection in a patient as well as its use for public health purposes in diseases like rickettsial infections, dengue fever/dengue haemorrhagic fever, hepatitis B infection, respiratory virus infection and melioidosis, and tuberculosis (mycobacterium) is currently being studied.

The Faculty of Engineering via its Chemical and Processing Engineering Department carries out research on Food Process Engineering and Material Development to produce value added products and to improve existing processes. Some examples in Food Technology include production of sesame oil, cinnamon oil, juggery (Palm candy) and carbonated beverages via improved techniques. These researches are targeted at increasing the productivity and quality in the food sector. Further, investigation of therapeutic properties of endemic fruits and extraction of the responsible bioactive chemicals is currently underway in order to produce drugs that function more effectively than the fruit itself. Such innovations target at new business opportunities in the field of pharmaceuticals. Synthesis of value added products from dolomite and using natural fibres to make roofing sheets are current areas of Material Development research that will attract new business ventures.

FUTURE PROSPECTS FOR RESEARCH AND RESEARCH PRIORITIES It is to be noted that cost of production in agriculture in Sri Lanka are relatively high due to the high cost of imported inputs like chemical fertilizers, pesticides, weedicides and the cost of labour. The agrochemicals also have serious adverse effects on health and the environment. More research is needed to promote traditional/natural agriculture. Modern organic farming technologies should be fine-tuned

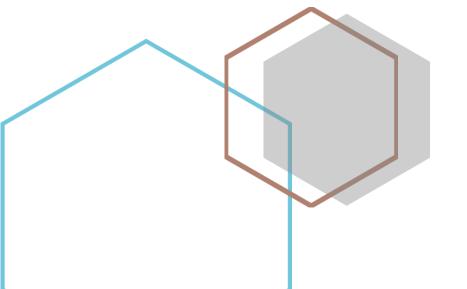


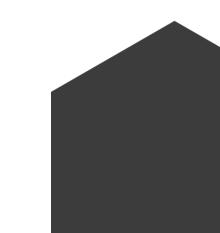


to suit local environmental conditions. The cost of planting materials should be reduced, while increasing the yield, through R&D using traditional seed varieties and applying modern scientific methods (e.g. genetic engineering). Food imports can be reduced by growing items which suit our climate and soils. Cattle fodder of high quality for the dairy industry can be produced so that 400 million USD worth milk imports can be minimized, since the required R&D is already available. The drying and canning industries require the necessary R&D. In addition, R&D which is already in progress to develop industrial products from fish waste should be promoted, since Sri Lanka is an island that possesses a huge oceanic zone.

Further building up of centers to promote multi-disciplinary research in industrial, applied and fundamental aspects of science, technology and development in relation to the areas such as biotechnology, advanced materials, mechatronics, electronics and information and communication technology is identified as a future development. Such centres should ideally become self-financing by attracting private sector funding, licensing income as well as undertaking contract research. These centers would create an environment where scientific knowledge and technology could be developed, acquired, adapted and exploited for the progressive modernization and growth of all sectors of the economy to enhance the Country's competitiveness in world trade. Hence, bringing the centres to one physical location would ensure maximum sharing of both human and physical resources with immense opportunities for multidisciplinary R&D. This will also help expand both local and international collaborations with the University. The necessity of infrastructure facilities to apply modern technology in both teaching and research is crucial for the development of these centres. Adequate funding from Government or other sources is required for this purpose, which is a major hurdle to be overcome.

University priorities for research and innovation targeted at inclusive economic growth







UNIVERSITY OF PERADENIYA'S ROLE IN SUSTAINABLE ECONOMIC GROWTH Sustainable economic growth is economic development that attempts to satisfy the needs of humans but in a manner that preserves natural resources and the environment for future generations. University of Peradeniya has been host to many of the nation's visionaries, from all corners of society. Thus, there is no better setting in Sri Lanka to assist in sustainable development - an issue so crucial to our society. The main objective of this is to make higher education to be recognized as the foremost contributor to society's efforts to achieve sustainability. Achieving sustainable development needs cooperation among sectors and institutions, and the involvement of all the concerned partners and individuals.

University of Peradeniya currently excels in sustainable built environment, since built environment and operation of associated industrial activities have been identified as the main consumer of resources and the major contributor to climate change and other environmental issues. Thus, effective interventions at planning, design, construction and operation stages of built environment can lead to a significant improvement of global environmental conditions. A postgraduate course on sustainable built environment is now been offered by Department of Civil Engineering at University of Peradeniya. The students of this programme will have an opportunity to expose themselves to the concept of "Green Building Techniques" applicable in many disciplines of engineering. The main objective of this programme is capacity building in the area of sustainable built environment. Thus, the graduates can be eligible to become a Green Building Certified Professional (GBCP) authorized by the Green Building Council Sri Lanka (GBCSL).

Additionally, the Master of Development Practice (MDP) at the University of Peradeniya was launched in 2011, supported by funding from the MacArthur Foundation and guidance from the Earth Institute, Columbia University. MDP is a two year graduate-level global multi-disciplinary programme geared towards equipping development professionals with knowledge, skills and attitudes necessary to address today's complex development challenges. The students can work across different fields to design and manage integrated development interventions and to design appropriate policies to support sustainable development. Students are expected to gain competencies in at least three of the five areas: Technical Skills, Integrative Skills or Cross-sectoral Understanding, Communication Skills, Project Management and Social Cultural Skills.

SOCIAL AND GENDER INCLUSION

Social inclusion could be defined as provision of certain rights to all individuals and groups in society, such as employment, adequate housing, health care, education and training, etc. Broadly stated, it is the act of making all groups of people within a society feel valued and important. Every individual should feel that their opinion is heard and taken into account in the process of policy making. Social inclusion is





one of the most important goals included in the United Nations Sustainable Development Goals, and strengthening social inclusion is vital for a country to ensure sustainable development, lasting peace, and reconciliation. Sri Lanka is a Country where multi-cultural, multi-lingual, multi-ethnic and multi religious groups live together. "Accelerating growth with social inclusion" formed the broader theme of the 2017 National Budget of Sri Lanka. Hence, social inclusion is recognized as an important feature in the economic growth of the Country. Education can aid to equip the young with necessary social, cultural and civic competences, in order to foster positive interaction, understanding and respect among individuals from diverse backgrounds. The European Commission's first Annual Colloquium on Fundamental Rights (2015) showed that education has a crucial role in preventing discrimination and hatred. Schools can be considered the ideal place to transmit the values of tolerance and respect, since they reach out to all children from an early age. Thus, teachers should be better equipped and empowered with knowledge and ideas to address diversity in the classroom. Sri Lanka, as a nation, must ensure that each and every citizen, regardless of ethnic, geographic and gender differences work together, in unity, to ensure equal opportunities for all citizens, and spanning all generations.

It is the G.C.E. Advanced Level (A/L) exam that determines university entrance in Sri Lanka. Thus, the University Grants Commission (UGC) of Sri Lanka decides on the quota of students that can enter a particular university based on the A/L results. Therefore, it is the best performers that enter a university in Sri Lanka, and it is difficult to balance student entries with regard to gender, ethnicity, etc. But upon entry to the university, all the entrants are treated alike by the university irrespective of their gender or background.

University of Peradeniya provides the highest standard of teaching, learning and research with academic freedom to all its students, respecting the cultural and ethnic diversity amongst them. There are places of worship for students of all major religious groups (Bhuddist Temple, Hindu Kovil, Islamic Mosque, Catholic and Anglican Churches) within the University premises, thereby maintaining ethnic equality, religious pluralism, peace and harmony. University of Peradeniya is the only university in Sri Lanka with such religious institutions within its premises. Students get together not only for academic work, but also in other activities like music, sports, culture, etc. This creates brotherhood, togetherness and unity amongst all the ethnicities which the University inculcates in its graduates as this outlook aids them to be better leaders in Sri Lanka's diverse society.

Gender inclusion is one important aspect in the economic growth of a developing country. Sri Lanka has not made much progress in reducing the gender gap. According to 2012 statistics, women account for 52 percent of the total population and over 20 percent of households in Sri Lanka are headed by women. Furthermore, approximately 62 percent of undergraduate entrants to university are women. However, despite such demographic and educational advantages, women account for only 30 to





35 percent of the workforce. Moreover, the unemployment rate for women is twice as high as that for men. It is the skill and dexterity of women that sustains the plantation sector, textile and garment sectors and remittance from working abroad. In all these instances, the role of women has not been given outstanding recognition. Also, they take the suffering in taking up the "less socially reputed" jobs. This discrepancy needs to be corrected before tangible steps are taken on the path to sustainability.

It is seen that there seems to be a huge gender discrepancy in the enrolments of students to universities. For example, at University of Peradeniya, 62 percent of undergraduates in 2016 were females. It is seen that gender disparity is also extended to some of its Faculties. For instance, at the Faculty of Engineering, 77% of its undergraduates are males. But at the Faculty of Arts, which contributes to one-third of University of Peradeniya's student population, 80% of students are females. This issue is due to the very fact that in A/L exams, a high proportion of girls follow the Arts Stream and a high proportion of boys follow the Mathematics Stream. Therefore, the gender discrepancy amongst students following various subject streams at A/Ls is reflected at university level. However, University of Peradeniya maintains its state of gender equality, such that University of Peradeniya considers gender equality to be of high importance, where both male and female students have equal chances for conducting research, and are invited to engage in research, and both genders are equally treated at undergraduate and postgraduate levels.

FIGHTING YOUTH UNEMPLOYMENT, UNDEREMPLOYMENT AND PRECARIOUS EMPLOYMENT Youth unemployment is a major issue in Sri Lanka. Many qualified young people have the 'technical skills' or appropriate academic qualification for a job but lack the soft skills to convert their knowledge into a profession. In Asia, youth account for about 20% of the population, and yet make up nearly half of the unemployed in the region. The youth are at least three times more likely than adults to be out of a job; in South-East Asia and the Pacific this ratio is nearly five times. In Sri Lanka, the youth unemployment rate stands out at 19%, which is more than fourfold the overall rate of 4.9%. This is a global issue, too, because even in other "prosperous" countries, about one in six young people are unemployed. Hence, unemployment is amongst one of the world's fastest rising concerns.

This is true even with regard to the underemployment crisis in the Country, where the Sri Lankan labour market reflects a skills mismatch. This is particularly noted amongst graduates in some of the subject fields, wherein jobs available are either unattractive to them, or the labour market opportunities simply do not meet their aspirations. The reasons could be the perceptions/stigma of youth about the occupation or due to its precarious nature.

Precarious employment is non-standard jobs that are poorly paid, insecure, unprotected, and cannot support a household. Such employees





rarely receive social benefits and are often denied the right to join a union. Even when they have the right to unionize, workers are scared to organize if they know they are easily replaceable. Women, minorities and migrant workers are much more likely to fill these kinds of jobs. Even in Sri Lanka, permanent employment across a number of sectors has shifted recently to being precarious jobs through outsourcing, use of employment agencies, and inappropriate classification of workers as "short-term" or "independent" contractors. This is alarming, because these jobs, although not valued, are integral to the functioning of an organization.

The University of Peradeniya at current produces professionals in diverse areas via its nine faculties. The employability of these graduates exceeds 96% in Faculties of Medicine, Engineering and Dental Science. While a significant amount of the undergraduates in other Faculties go abroad for higher studies, only a few remain in the Country seeking gainful employment. However, students who follow subjects in the fields of Humanities and Social Sciences have a problem of finding suitable employment due to the mismatch between the job market requirements and the academic qualifications. Therefore, some graduates have to be engaged in irrelevant jobs while some of them have to be unemployed and waiting for a long time mostly until the government provides them with opportunities.

Universities historically exist as institutions for the creation and dispersion of knowledge. The University of Peradeniya seeks to cater broadly to the diverse needs of the Sri Lankan society in the form of scholars, artists, ideologists, and social leaders who contribute to the thinking, arts, culture and even the policymaking of the country. It is noteworthy that although the University continuously tries to match the employer needs in the job market by updating its courses and introducing new study programmes, some courses (like in the fields of humanities and social sciences) might not match the demands of the jobs. Hence, improving the employability of graduates and undergraduates is the main focus of the University of Peradeniya at present.

The main aim of University of Peradeniya's Career Guidance Unit (CGU) is to facilitate students to make more informed and better educational and career choices. CGU provides information on professional courses available to students, career options, types of academic and personal development and occupational training needed to succeed in the workplace; along with in-plant trainings and job opportunities that are associated with the student's field of interest. Recently, this unit has started a project on promoting startup companies by graduates with the assistance of the National Enterprise Development Authority which provides seed money and training. About 15 companies are established per year under this project. The CGU is planning to link investors for these companies for future expansion with the help of a national programme called "Eth Pawra". The CGU recognizes that a fresh graduate could become successful in this





competitive world by setting proper career goals and making career plans from the first year in university, which requires strategic thinking on the part of the young students.

The University periodically carries out research on ranking of employability skills of its fresh graduates. The required soft skills are provided by the CGU. The CGU reached about 50% of the student population during the year 2017. With regard to the unemployment of youth who are not university students, UoP indirectly addresses them via participation in policymaking and building up of strategies with the Government to introduce other ways of higher education. This involves sharing of University of Peradeniya's academic environment as resource persons in vocational and training institutes and as lecturers for external degree programs.

One such centre is the Centre for Distance and Continuing Education (CDCE) of University of Peradeniya. It functions with the mission to provide opportunities for those who look for education without barriers. CDCE, in pursuit of its vision to provide equal opportunities for all aspiring to further their career goals, provides a wide range of certificate, diploma, and external degree programs for individuals who could not gain access to conventional university education.

It has to be noted that in addition to over 3,000 employees as nonacademic and administrative staff, the very existence of the University of Peradeniya has indirectly created some self-employment opportunities in providing services, for example providing food and accommodation, communication, security, cleaning/maintenance and transport facilities for University staff and students. But this alone will not suffice since University of Peradeniya can provide only a small fraction of the employment opportunities needed for the locality and the region. Hence, additional means must be envisaged to fight the unemployment problem. Sometimes, graduates are recruited for Government jobs through an open selection process which does not test them in their subject disciplines, but on areas like IQ, General Knowledge and in some cases English Language and IT. So, irrespective of the subject of specialization, graduates who pass this test would be recruited. This is also an issue that needs to be addressed, because it will not help graduates to apply their knowledge gained to the job.

ERADICATING
POVERTY, ACCESS TO
UNIVERSAL SERVICES
AND IMPROVEMENT
OF THE LIVING

Although poverty has declined in the country over the last two decades, the poverty levels in the estate sector remains relatively high. In addition, Districts such as Moneragala, Ratnapura, Badulla, Kilinochchi, Mannar and Mullativu still languish behind in terms of poverty (above 10 percent), maternal health and secondary education. In Sri Lanka, 21.6 percent of children below the age of five are underweight and in the estate sector the percentage is close to 30 percent. The share of household income of the poorest 10 percent of households remains less than 2 percent, while the corresponding share of the richest 10 percent remains close to 38 percent during the last two decades. Such





inequalities need to be rectified as a requisite for a stable, sustainable development trajectory and remains a challenge.

It has been shown in the UNESCO Global Education Monitoring Report that education helps reduce poverty, increase individual earnings and also reduce economic disparities between the rich and the poor. Hence, the importance of higher education must be stressed, and the present day youth should be guided properly towards improving their knowledge, skills and attitudes in order to alleviate poverty and lead a better life.

Reduction of poverty brings full access to universal services which in turn leads to overall improvement of the quality of life in the country. Sri Lanka at the moment has improved access to communication and IT facilities through Government and private communication/network service providers, spanning from rural to urban areas. But the current IT literacy rate of 28% in the Sri Lankan community must further improve in order to enable communities to take full advantage of these facilities.

The University of Peradeniya at the moment is not directly involved in addressing these issues. However, the University delivers degrees and courses to mould undergraduates into becoming efficient and powerful decision makers that actively contribute both to policymaking and to implementing strategies at national levels. Since it is a known fact that education can help alleviate poverty, the University of Peradeniya has recognized that providing access to knowledge to more people, other than for university undergraduates, will help to make lives better for people. Thus, the University of Peradeniya has a goal to provide access to a wider range of educational programs in order to contribute towards the development of a knowledge-based society. To achieve this goal, the University of Peradeniya is currently in the process of developing new distance and continuing education programs and related services. In the meantime, community development projects are being initiated via the University of Peradeniya's outreach programs such as workshops, seminars, exhibitions, etc.

FUTURE PROSPECTS FOR RESEARCH FOCUSED ON SUSTAINABLE GROWTH One of the biggest challenges faced by the Government is inadequacy of robust research and evidence on which policies should be based. Information on the labour market, on transitions from university to work, and on the link between disciplinary area and employment prospects should be available. Beyond completion of degree courses, there is a severe lack of information on the knowledge, skills and values that graduates actually possess. Research that assesses student perceptions of university quality and their own employability needs is also required. Solving the problem of graduate unemployment needs coordinated efforts between diverse segments of Government, employers and the society to enhance the quality of university education. This would improve individual life chances and also contribute to the broader development of the society.

Studies need to be carried out to identify the fields in which employment





opportunities are available in Sri Lanka. This should be done considering the policies and interests of the Government and the strategies targeting the economy. Such areas include Tourism and Hospitality Management, Fisheries and Oceanology, Online/Social Entrepreneurship, Value Addition of Natural and Ayurvedic Products, etc. Courses and programs taught at the University must be updated so that they become more joboriented and relevant to the available offers on the job market. In addition, empowering students with personal qualities such as reliability and transferable skills like leadership, team-working and problem-solving will help minimize the mismatch between employer requirements and graduates' displays of skills in the workplace, particularly in relation to communication, decision-making and critical thinking.

The future generation should be equipped with new knowledge in order to exploit the full benefits of these fields to the Sri Lankan economy as most of these require a high level of knowledge. Now it is high time to answer the following questions:

- Does the education system as it is today permit the innovation and skills development needed in the future?
- How should the vocational training centers be upgraded to skill youths on an on-going basis?
- With jobs going into the virtual space, does it make sense to have people sitting in an office or will there be other models of working that will be more focused on output and impact than on presence in an office?

It should be noted that entrepreneurship programs are also being conducted by various Faculties of the University of Peradeniya via its Public Outreach Programs. However, such offers need to be strengthened by means of increasing partnerships between the University of Peradeniya and local and foreign entrepreneurs. This can take the form of building up trusts, concluding Memorandums of Understanding, and other means of linkage. If multidisciplinary large scale research could be carried out with adequate funding, it could provide intern/research assistant positions for fresh graduates wherein they gain research experiences as well as appropriate stipends till they find a suitable occupation.

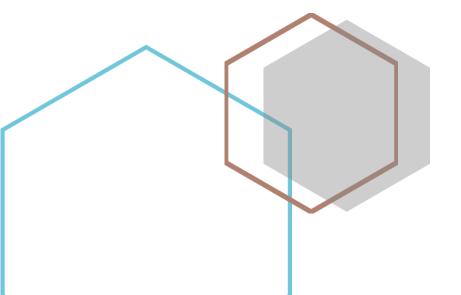
Also, the Alumni Association of University of Peradeniya, which links professionals graduated from the University of Peradeniya with prospective students needs to be developed as a platform for employers looking for multi-talented graduates as employees.

Research to assist policymaking with regard to these issues, which involve statistical data, trend analysis and future forecasting, must be carried out at University level. This is important so that the Government can develop programmes and initiatives to address them. Also, the University of Peradeniya is trying to enhance its community development projects and interaction with a wider audience through faculties/societies/centers etc. The necessity to build a Community





Development Centre to coordinate these activities at the University of Peradeniya has risen of late. Such a Centre would allow the University to strengthen its social contribution. University priorities for research and innovation targeted at pressing challenges facing societies in Southern and Southeast Asia





CLIMATE CHANGE RESILIENCE, ADAPTATION AND ENVIRONMENTAL ISSUES

Climate change dominates many other problems generated by our economic and industrial progress. The current trend of global warming, started with the Industrial Revolution, has caused great concerns amongst scientists, politicians, and individuals around the world. Dramatic melting of polar ice caps, rising sea-levels, swings in rainfall patterns leading to extended droughts or floods, and more frequent extreme weather events are only some of the effects of global warming and changes to the global climate. The loss of human lives and livelihoods is escalating. No country will remain unaffected, emphasizing that climate change mitigation and adaptation are necessary to address one of the greatest challenges faced by the present world. Climate change is a complex global problem as it is intertwined with many other issues, such as economic development and poverty reduction. Developing countries, like Sri Lanka, are the least responsible for climate change, yet among those that are most at risk from its ill-effects. Progress is required on many fronts: development and transfer of green technologies, reduction of greenhouse gas emission, and establishment of effective government policies. It is equally important to provide education and training, and promote public awareness to the widest audience possible. The necessity to create an informed global community, a well-informed workforce, and enlightened government officials fully aware of their responsibilities in climate change mitigation and adaptation is immediate.

Unfortunately, Sri Lanka's performance in terms of environmental conservation leaves much to be desired. Post-independence, the island nation has been experiencing a rapid degradation of natural resources. As of 2012, forests covered 29 percent of Sri Lanka's surface. This value, diminished as it is, has been decreasing at a precarious rate over the past decades. During 1990-2005, the aggregate forest cover was reduced by almost 18 percent - at a rate of 1.05 percent per year. Environmental degradation is of great concern as Sri Lankan society is particularly susceptible to swift changes in the environment.

Environmental management and pollution control are increasingly becoming important for the industries not only due to customer and regulatory pressure, but also due to the fact that many companies now consider it as their responsibility to minimize the environmental impacts of their activities, products and services. New regulations, such as the proposed emission standards, pose a challenge to industries as new measures must be adopted to achieve compliance. It is noteworthy that Sri Lanka has a high degree of endemism and sensitivity. Thus, matters pertaining to the environment have to be treated tactfully. As Sri Lanka gears for rapid economic development in the coming decades, the need for the implementation of an efficient mechanism for sustainable development becomes crucial. Economic growth should not come at the cost of the country's unique biodiversity.

Educational interventions are most successful when they focus on local, tangible, and actionable aspects of climate change and environmental education, especially those that can be addressed by individual





behaviour. Hence, University of Peradeniya, which is the Garden University of Sri Lanka, has taken enormous steps to address this issue over the years. Use of polythene has been avoided, and waste disposal is carried out after screening waste. Thus, the University of Peradeniya has taken the initial steps to operate as a Green University, in order to protect the environment through example.

Over the past 22 years, the Center for Environmental Studies (CES) at the University of Peradeniya has rendered a significant service both to the University and to the Nation in the field of environmental education and training, especially in environmental impact assessment. Work at CES has been aimed at influencing policy and strengthening the institutional support required for better management of natural resources. In addition to carrying out research projects that are local, national, and international in scale, the center actively contributes to local thinking and provides intellectual input on sustainable development through representation in government committees, and participation in seminars on local issues, training programs, and workshops. The center is capable of providing consultancies on wide range of environmental issues. These include areas such as industrial environmental management and pollution control, Environmental Impact Assessment (EIA) for major developmental projects, adaptation and mitigation options to climate change and biodiversity losses, etc. CES also conducts training programs on tropical biodiversity, climatic change and its impact on tropical ecosystems, and industrial pollution control and waste management.

NATURAL DISASTERS

Sri Lanka was one of the countries that were struck by the devastating Tsunami in 2004, leaving behind widespread destruction, killing nearly 40,000 people and destroying over 100,000 homes. Its impact led the country to look anew into the management of emergencies and disasters. Specific approaches had to be applied to mobilize special groups for rescue, relief and emergency care. Although doctors, nurses, paramedical staff and voluntary groups went to the sites of devastation and provided relief and emergency care, there were no proper contingency plans, protocols and pro-active machinery to handle such situations at the time when the Tsunami struck Sri Lanka. Thus, the importance of a disaster management protocol for Sri Lanka was identified.

The Health Emergency and Disaster Management Training Centre (HEDMaTC) was established at the Faculty of Medicine, University of Peradeniya in 2006, with the assistance of the World Health Organization (WHO). With its vision to be the premier health emergency and disaster management training centre in South Asia, the mission of this centre is to contribute to the development of knowledge, skills and attitudes needed for appropriate, efficient and effective management of health emergencies through training and research.





HEALTH ISSUES

Basic research has led to some of the most commercially successful and life-saving discoveries of the past century, including the laser, vaccines and drugs. The University of Peradeniya has contributed and strives to do so in the future regarding major health issues in Sri Lanka.

Recently, Chronic Kidney Disease of unknown etiology (CKDu) has surfaced as a significant public health issue in Sri Lanka, with disease cases recorded in five provinces in the Country. Most of the hypotheses are related to quality of water and excessive usage of agrochemicals, and therefore, people who do not have access to pipe-borne water are more vulnerable to the disease. Recent statistics indicate that around 1,500 Sri Lankans die from CKDu each year. Considering the national importance of this issue, the Faculty of Medicine of University of Peradeniya initiated the Centre for Education, Research and Training on Kidney Diseases (CERTKiD). The CERTKiD is one of the leading centers investigating Chronic Kidney Disease (CKD) and CKDu in Sri Lanka. Renowned Sri Lankan academics and clinicians in the fields of Medicine, Geology, Chemistry, Environment Science and Social Sciences participate in many ongoing multidisciplinary research projects of CERTKiD. These research projects cover medical, environmental and social aspects of kidney diseases and are conducted in collaboration with leading universities in USA, Japan, Singapore, Australia and Germany.

Oral squamous cell carcinoma synonymously defined as oral cancer is the commonest malignancy in males of Sri Lanka. The reason for its high prevalence is the traditional practice of betel chewing. Research has convincingly shown that the ingredients in the betel quid (especially tobacco and arecanut) are very dangerous carcinogens. Despite the fact that oral cancer is preventable with habit intervention, prevalence data does not seem to show its decrease for many decades. This demands a scientific approach to intervene on this awful habit. The Centre for Research in Oral Cancer (CROC) at the Faculty of Dental Sciences, University of Peradeniya was established to facilitate this process. The Centre works very closely with the National Cancer Control Programme of Sri Lanka. On one hand, this centre tries to improve awareness about the harmful effects of betel chewing amongst relevant health professionals, policymakers and most importantly the public of Sri Lanka. CROC plans to introduce new research in the area of oral cancer and pre-cancer with multinational collaborations.

Sri Lanka has a youth population of over 4.4 million between the ages of 15-29 years. However, the National Youth Health Survey (2013) identified that 50% of young people had limited knowledge about sexual and reproductive health. According to the Family Health Bureau, teenage pregnancy in Sri Lanka was relatively low at 5.2%, but subnational disparities exist with a rate of 8-9% in some localities like the North and North-Central Provinces of Sri Lanka. Further, the Stigma Assessment of People Living with HIV (2017) indicates that the HIV prevalence in Sri Lanka is 0.01%, yet new infections are seemingly increasing, especially among young people. This shows that Sexual and Reproductive Health (SRH) is becoming a major crisis in the Country.





Due to this reason, the first National Training Course in Integrating Sexual and Reproductive Health Services was organized by the Health Emergency and Disaster Management Training Centre (HEDMaTC). This addressed the timely need of caring for women and children in crisis situation of Sri Lanka with the guidance, technical support and generous funding of the United Nations Population Fund (UNFPA) which is the United Nations reproductive health and rights agency. This venture was equally supported by the Ministry of Healthcare and Nutrition, Sri Lanka. After completion of ten successful SRH programs, 255 medical officers had been trained island-wide. Each program was targeted on training different groups such as officers of NGOs/INGOs, middle level administration officers of Ministry of Health, University lecturers, Medical Officers, Medical officers of Maternal and Child Health, Regional Epidemiologists, Medical Officers in the clinics of Sexually Transmitted Disease, officers in the Disaster Management Centre, etc.

The South Asian Clinical Toxicology Research Collaboration (SACTRC) is an international partnership of clinicians and researchers mainly from Australia, Sri Lanka, UK, Germany and Denmark. This organization works towards reducing morbidity and mortality from deliberate selfpoisoning or accidental poisoning and envenomation, community based public health interventions, clinical trials and research. Since 2004, work had carried out with multiple partners, including universities across the globe and the Sri Lankan Ministry of Health, to support academic ventures that are relevant to the community, by building research capacity and infrastructure in the island and its surrounding region. SACTRC is a non-profit-generating organization supported by the University of Peradeniya and funded by competitive research grants. SACTRC is striving to establish Sri Lanka as a regional hub for medical research and professional training in toxicology and toxinology, by working with governmental organizations and other groups or individuals in order to conduct, facilitate and promote research that will help eliminate risk and optimize treatment of poisoning and animal bites, and to translate research into policy and practice by supporting professional and community education.

FUTURE PROSPECTS
FOR RESEARCH ON
THE CHALLENGES
FACING SOCIETIES IN
SOUTHERN AND
SOUTHEAST ASIA

Universities can provide access to data, research and knowledge that supports informed decision making and public access to information about climate change. They can also play a key role in the preservation of indigenous knowledge about fundamental aspects of life, including farming, fishing, land use, and water management, etc. Much of the environmental problems arise from lack of necessary knowledge about the relationship between man and nature. The general public must receive environmental education to confront this problem, and the University of Peradeniya has the necessary resources to do it in a proactive manner. The University of Peradeniya expects to do it via its outreach programs by conducting various activities involving public participation (e.g. seminars, workshops, training, conferences, etc.). This



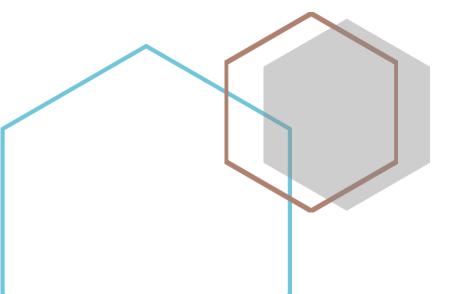


would form new behavioral patterns among individuals, groups and communities dependent upon the environment, and help them make conscious decisions benefitting the future generation.

Research in attempting to find greener solutions in the fields of energy consumption, construction, agriculture and industry must be expanded as well, since the challenge imposed on Earth to provide the necessary food, raw materials, and energy for mankind's consumption has had many consequences on the health of ecosystems around the globe.

Also, the University expects to strengthen and maintain the ties with Government authorities and aid in drawing out legislatures with regard to environmental protection, with special attention to management of solid waste disposal and natural disasters. Good environment practices need to be inculcated at school level, which requires training of school teachers in how to make schoolchildren environmentally sensitive. Hence, change is required from both top and bottom ends of the society for a greener future.







The University as a whole, via its central administration, provides the administrative support for research programs through Faculties, Centres and Institutes. The University of Peradeniya has been recognized as the number one university in the country in terms of research publications. Technological Faculties such as Science, Engineering and Agriculture are trying to promote an innovation culture and student research projects are linked to public/industrial exhibitions and national-level evaluation and rewarding processes by the Intellectual Property Office in the country. Although the University is supporting such activities, the progress of commercialization of innovations is very slow in comparison to the Universities in the region. The University has not established a technology incubation cell so far, but a University Business Cell has been established very recently to support industrial research with students. The IPR policy has also been approved by the University and the path toward promoting innovation is being gradually developed. Unfortunately, the government financial regulations negatively affect the progress of most of these activities and delay the decision making process, as the University of Peradeniya is accountable to the government auditing system.

Possible challenges to the involvement of students in research:

- Low Funding
- Irrelevance to employment/job market and graduate aspirations
- Social issues, lack of an established research culture in the country
- Insecurity in engagement in continuous research
- High monetary inputs giving low research outputs
- Inability to commercialize research, invisibility/low visibility of inventions
- Lack of partnerships for innovation
- Low student incentives and support
- Impossibility to retain talented researchers in the Country/ Brain Drain
- Lack of necessary equipment/lab facilities/ technical support personnel
- Lack of supervision in extreme cases.