Research informed guidance

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ASIA PACIFIC UNIVERSITY
OF TECHNOLOGY & INNOVATION

POLICY BRIEFS
SUMMER 2023

SUSTAINABLE DEVELOPMENT GOALS

CONTENTS

Creating safe classrooms to give prisoners their right to education

Ross Little, De Montfort University Leicester, United Kingdom

Summary

We need to create new safe learning spaces and educational opportunities that recognise the particular circumstances of people in prison. The creation of trustworthy prison classroom spaces requires re-privileging informal pedagogic praxis and abstracted discussion to enable learning opportunities that have previously only been realised occasionally or, at best, inconsistently.

Introduction

The right to education is a human right that has been acknowledged in both international and domestic law. The Universal Declaration of Human Rights (Article 26), for example, states: 'Everyone has the right to education', implying that the right to education and training applies to all persons, including all persons in prison (cited by Vorhaus, 2014). Similarly, article two of the first protocol of The Human Rights Act states that 'no person shall be denied a right to an education' (Human Rights Act, 1998, Part II Article 2).

Key messages

- **Promote and protect people's right to education in prison, so that it is more widely practised.**
- **Create opportunities for learning that recognise the particular circumstances of people in prison, and their humanity.**
- **Re-privilege the creation of informal dialogic learning spaces in prisons, and other 'low trust' contexts.**
- **Recognise and promote the pedagogical value of using abstracted questions and discussions to generate interactions in low-trust contexts and enhance the pedagogical capital of learners (Little and Warr, 2022).**
- **Advocate for the creation of prison classroom spaces co-produced with learners in prison to enhance trustworthiness. This process may also involve students from beyond the prison walls to aid the endeavour.**

However, the rights and entitlements of people in prison are frequently forgotten, not prioritised or actively undermined. In recent years, the gap has widened between the educational opportunities available in the communities of England and Wales and the opportunities available in prison. This problem has a number of causes, including political neglect, a misconceptualisation of the purposes of education in prison, and a growing disconnect between access to learning resources in prison relative to the outside world. If this gap is permitted to grow further, there are further reduced chances for ex-prisoners to re-connect with the world they return to, and increased likelihood of associated socio-economic and human problems as a result.

The available evidence suggests that people held in prison have been left behind for many years in terms of their access to opportunities for education and learning in England and Wales. If anything, the gap grows further as access to learning resources in prison diminishes and the problems slip further down the political priority list. Reviews commissioned by the UK government, focusing on the adult and child prisons estates respectively (Coates, 2016), have corroborated the importance of making progress in this area.

The consequences of low academic skills and achievement for individuals left behind by the educational system are considerable, particularly in a competitive market economy. Engagement with educational initiatives has the capacity to create a more stable environment in which prisoners can serve their sentences

securely and safely (Nichols, 2021). Additionally, staff whose role it is to ensure that safety, can work in safe and humane conditions that should be expected in a modern penal practice.

About the research

It is recognised that education in prison can have considerable benefits in the immediate prison context, including reduced pressure on adult males to adopt and display hegemonic masculine traits; helping prisoners to cope through mental escape by focusing on a meaningful activity and alleviating pains of imprisonment; allowing people the opportunity to re-create aspects of their identity; and enhancing relationships with friends, family and others (Nichols, 2019).

The need for significantly more attention is required in terms of the educational offer for long-term prisoners. For such individuals, the purpose and utility of education and learning will necessarily differ and should be catered for.

A recent study of men and women serving life imprisonment for murder, from a young age (Crewe, Hulley & Wright, 2020), found that for some, 'learning, education, and trades' represented important routes to surviving a long custodial sentence. It was one of the few aspects of life over which individuals had any sense of autonomy, providing a means to modify one's mood and free themselves (albeit temporarily) from the 'grip' of the institution. In this context, the author of this policy brief embarked on participatory evaluative research in a prison for life-sentenced prisoners (HMP Lifer). The research took place in a prison classroom shared over eight weeks between learners from the prison and a group of undergraduate criminology students from De Montfort University. Data was generated from the pedagogical context and included discussions reflecting on sessions; written reflective pieces by the prison and university students which were submitted voluntarily towards the end of the course; reflective feedback by participants at the end of the course; and semi-structured interviews undertaken approximately two months after the eight-week course ended. The findings are the subject of three forthcoming publications, which underpin my PhD thesis.

Recommendations

Promote and protect people's right to education in prison, so it is more widely practiced

The Council of Europe sets out three 'justifications' for education in prison (Council of Europe, 1989) - to limit the damage and degradation done to men and women by imprisonment; to support and address prior educational disadvantage commonly experienced by people in prison; and to support the process of moving away from crime.

Despite, or perhaps partly because, it is more than 40 years old, this declaration has been eroded in the context of England and Wales. The review of prison education by Dame Sally Coates (2016) recognised the need to revitalise commitments to prison education, proposing the more widespread use of partnerships with universities.

The Council of Europe is clear that education for people in prison has wider purposes than preventing recidivism or finding employment, important though these are in practical terms. In particular, it highlights the need for a holistic understanding of education, that recognises the benefits of learning for the sake of learning. My research with long-term sentenced prisoners strongly suggests this is fundamentally important.

Create opportunities for learning that recognise the particular circumstances of people in prison, and their humanity

As recognised by Coates and the Council of Europe, amongst others, new pedagogical approaches are required that recognise the particular circumstances of people in prison, and their humanity. Importantly, this should not be understood as 'offender learning'. There is no evidence to suggest that so-called offenders learn any differently to non-incarcerated people. Their circumstances, however, do create particular pedagogic requirements and opportunities for learning.

Re-privilege the creation of informal dialogic learning spaces in prisons, and other 'low trust' contexts

An important element here is to 're-privilege' informal learning opportunities that bring together individuals from different contexts for the purpose of exchanging perspectives, knowledge, and understanding (Warr, 2016). This may have benefits for other 'low-trust' contexts, including HEIs whose teaching has become dominated by bureaucratic logics and associated technologies, such as pre-determined, power-laden learning outcomes.

Recognise and promote the pedagogical value of using abstracted questions and generate discussions in low-trust contexts and enhance the pedagogical capital of learners

A recently published article (Little and Warr, 2022), and my thesis submitted in 2023, argue for the importance of abstract questions and discussion in helping prison student learners engage in the processes of learning. It explores how ethical pedagogical praxis, underpinned by moral sight, combine to create a trustworthy pedagogical context in a prison classroom (Little, forthcoming).

Advocate for the creation of prison classroom spaces co-produced with the learner to enhance trustworthiness. This process may also involve students to help in this endeavour

It also explains how the principles and practice of co-production can help to produce a trustworthy learning space. Bringing people from the 'outside' to engage in knowledge sharing and exchange, and to help co-produce a learning space, can bring considerable benefits, including the de-institutionalisation of the learning space.

About the author

Ross Little is a senior lecturer in criminology at De Montfort University. Between 2016-2019, he ran a series of educational courses in prison classrooms that brought together university students and prison students. He will submit his thesis *How can trustworthy learning spaces be created in low-trust contexts? Co-producing the prison classroom in HMP Lifer* by concurrent publication in 2023.

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Transformational transnational education can help us achieve our SDG commitments

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Summary

Global universities must serve the regions and societies in which they are embedded. They must be instrumental as agents of change and through their programmes of engagement, academic practice, and graduate advocacy, work to achieve Net Zero and the Sustainable Development Goals (SDGs).

Introduction

As we face unprecedented societal and environmental challenges, Partnerships for the Goals must grow exponentially – as must the inculcation and advocacy of the SDGs by our youth.

Whilst Higher Education Institutions (HEI) are understood to have a significant role in implementing sustainable development, there is a need for this impact and influence to extend beyond the home campuses in a way that is unified and measurable.

Key recommendations

- 1. Transnational education campuses should amplify SDG advocacy and impact through partnerships.
- 2. Embed Sustainability, Employability and EDI and Decolonisation strategies connected to SDGs through Nexus interlinkages.
- 3. Establish a culture of integrated, collaborative working around SDG 17 Partnership for the Goals.
- 4. Orientate curricula to examine cultural difference, identity, relevance and regional specifics.

About the project

Transnational Education (TNE) must become transformational more than transactional – through Partnerships for the Goals. By developing partnerships with local businesses, governments and NGOs – overseas faculties and partners can commune around the SDGs and integrate these goals into programmes of outreach, employability, and internship that mutually serve all involved and deliver on the SDGs.

By inculcating in its students, a "trans-disciplinary perspective that is universal, integrated, and transformative" (Vaughter, P. UNU, IASS 2018), universities can encourage behavioural change, bolster civil society and meaningfully work towards sustainable futures.

This was trialled at the De Montfort University's Dubai Campus (DMU's first full branch campus), where the conference Achieving the TNE Strategy Objective was hosted with 70+ regional and international speakers, at the first UN PRME conference focussed on SDG 17 Partnerships for the Goals

In parallel with the DMU strategic goals, a model is proposed, which incorporates four TNE strategy objectives

1. Networks (Partnerships with Purpose): Partnerships for the goals. Creating narratives, opportunities for students and research and reputational capital through partnerships.

2. 'SEED': The development of coordinated campus-specific Sustainability, Employability and EDI and Decolonisation (SEED) strategies that are embedded within contextualised curriculums, and activities.

3. Collaborative Working: Taking place across countries, campuses, faculties and disciplines – specifically to create non-siloed, interdisciplinary, and transdisciplinary research and learning experiences for both staff and students.

4. Contextualised curriculums: Cultural difference and relevance, regional specifics, identity and background, network opportunities and USPs for publicity and recruitment.

The scale of UK higher education transnational education

Percentage changes from 2018-19
Data source: HESA aggregate offshore record (2019–20)
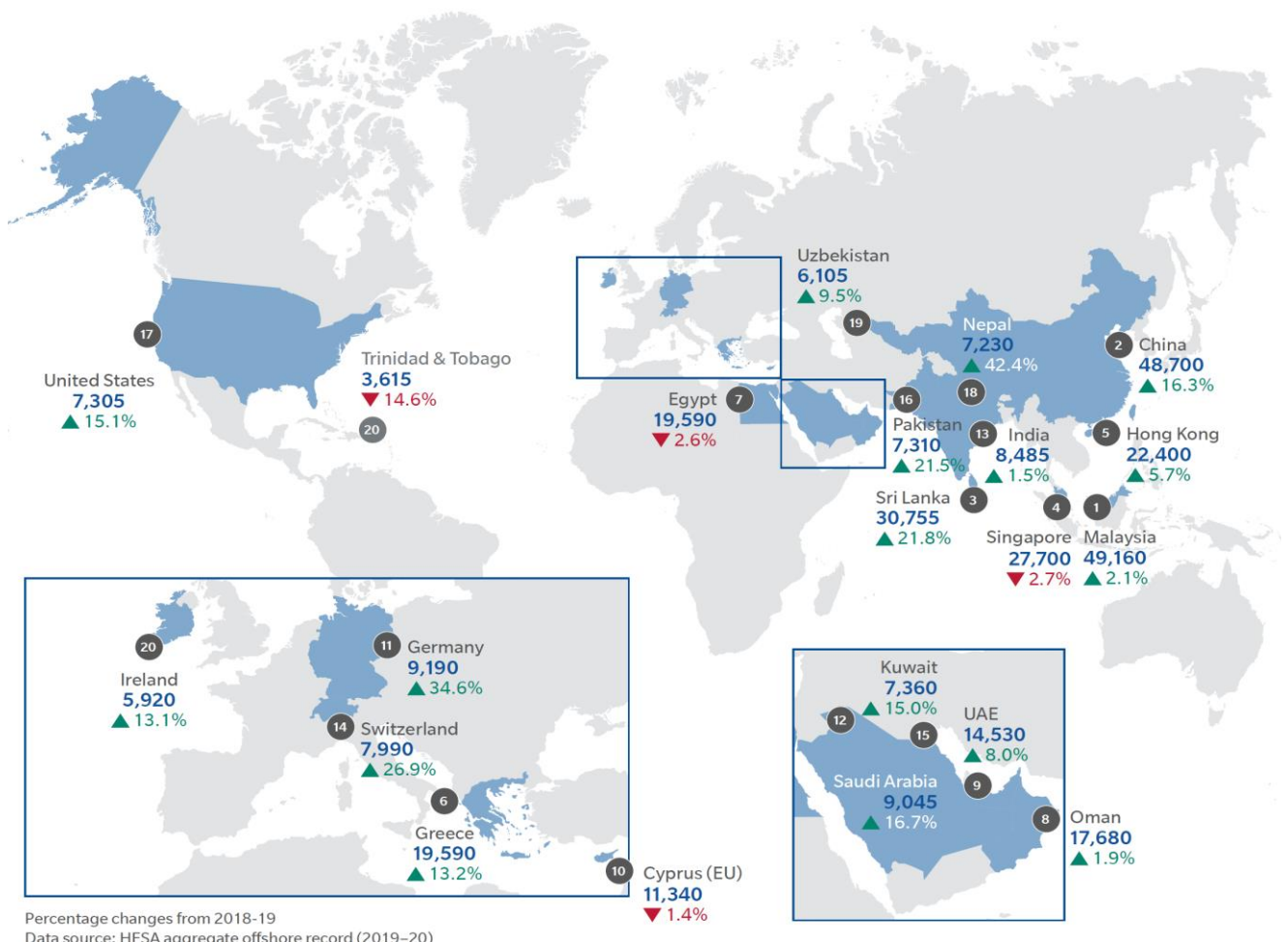
Source: Universities UK 2020. UK TNE Worldwide 2019-20

Recommendations

1. Networks – partnerships with purpose

Develop regional networks with HEIs, business, NGOs and Government. Seek the alignment of interests and mutual goals to bring these actors together. Utilise DMU's UN hub status for SDG 16, or Global Compact Signatory status, or simply act as a Knowledge Hub and venue for discussion and action for the SDGs. Integrate partners and opportunities for professional practice experience, placements, research, culture and knowledge exchange.

2: 'SEED' – Sustainability, Employability and EDI and Decolonisation strategies

Develop and integrate SEED strategies:

- Sustainability: Embed carbon literacy and SDG knowledge and advocacy within the curriculum, extra-curricular activities and campus operations.
- Employability: Embed employer insights, SDG advocacy and future skills (McKinsey, 2021).
- Equality, diversity and inclusion: Explore, embed and share home and TNE campus-oriented perspectives for 'fair treatment and opportunities for all'.
- Decolonising: Explore, embed and share TNE campus regional perspectives to discover "new canons of knowledge" (Arshad, R. THE. 2021).

3. Collaborative working

Establish a non-siloed campus through integrated collaborative working – of both staff and students. Achieve and maintain this through the unifying SDGs. Integrate a culture around SDG 17 Partnerships for the Goals – through interdisciplinary and transdisciplinary student projects, staff research and experiential learning. Create a campus identity and narrative around collaborative working – to recruit and perpetuate.

4. Contextualised curriculums

Orientate curricula to examine cultural difference, identity, relevance, regional specifics, and opportunities (See Figure 1). Reflect and share home and TNE campus perspectives. Integrate both in each other's curricula and explore other contexts through the proposed TNE 'network'.

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Strengthening policies and building industry aware sustainable ergonomics in Malaysia

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Summary

During the Covid-19 pandemic, there was increasing concern for human interactions with urban environmental systems. This awakening acknowledged human-induced and human-created problems resulted in a greater push for wellbeing, safety, health, and comfort among work sectors that face occupational hazards and safety risks.

Data from ergonomics research in Malaysia showed that the planned design, construction and functioning of human-system interactions are linked to performance, productivity, efficiency, and other socioeconomic benefits.

Less addressed is industrial and public awareness about ergonomics policies that foster sustainability. The objective of this brief is to emphasis to policymakers that ergonomics should be a stated sustainability goal of Malaysian workplace culture. Our aim is to frame the entire chain of custody that brings together ergonomics practitioners' skills, knowledge, and understanding of risks, costs, and benefits in prioritising ergonomics for Malaysian work sectors.

Awareness building strategy must better integrate global standards with local standards. We recommend stronger emphasis on sustainable, practical, and affordable solutions to improve resource and design efficiency applying specific United Nations Sustainable Development Goals (SDGs) to foster awareness towards sustainable ergonomics design. Assessing the potential benefits of ergonomics must go beyond applied theories in the post-pandemic era. Industrial and public awareness of sustainable ergonomics design will be critical to enhance practices in occupational safety, improve productivity, efficiency, and business performance.

Key messages

- **Five step approach for ergonomics design planning.**
- **Review ergonomics standards periodically.**
- **Foster awareness with industrial-public sector collaborations.**

Introduction

Ergonomics mainly focuses on products and systems that attain universal design standards. These guidelines are well received by industrial sectors for reducing and preventing workplace and industrial-related injuries. Several Malaysian agencies play central roles in the adoption of, and adherence to, international standards such as Ergonomics: General Approach, Principles and Concepts by the International Organisation for Standardisation (ISO). SIRIM, the Department of Standards Malaysia, is the national agency whose role is the development of guidelines on standards and harmonising these descriptors to international standards. SIRIM adopts the ISO Standard as the MS ISO 26800:2013. MS is governed by the Standards of Malaysia Act 1996 (Act 549).

Another agency, the Department of Occupational Safety and Health Malaysia (DOSH), has non-mandatory guidelines aimed at reducing occupational accidents and diseases which compromise health and safety. DOSH applies the universal definition of ergonomics by the International Ergonomics Association (IEA). It also delivers regular industrial training and seminars to identify how design solutions minimises the risks of injury, fatigue, and error.

The challenges

In 2013, SIRIM developed the MS guideline as part of national standards policy to facilitate domestic and international trade cooperation in relation to standardisation. In the past decade, the publication of MS guidelines has not received much industry attention. Furthermore, SIRIM's Ergonomics Policy 2013 does not consolidate research data on the benefits of ergonomics design for specific sectors. Sustainability is merely an appendix in the policy. Sustainability of ergonomics design standards and specific guidelines for sectors that incorporate technologies in its facilities, has yet to be addressed.

Broad and unspecific guidelines

Another government agency, the Department of Statistics Malaysia (DOSM) provides big data analytics of national occupational accidents and fatal occupational injuries statistics from industrial cases reported between 2011 to 2021 (Figures 1 and 2). However, the long-range trend statistics use unspecified data indicators obtained from Malaysia's Social Security Organisation (PERKESO) and the Ministry of Human Resources for the purpose of risk analysis such as loss of workdays, production output, and income due to injuries. DOSM statistics do not helpfully inform employers with industry-specific guidelines for ergonomics best practices which promote workplace safety, or to protect and improve employee health and wellbeing, as well as to ingrain OSH into a more environmentally sustainable workplace culture (DOSM, 2022). In the accompanying media statement, DOSM indicated the voluntary basis of quantitative data collection, a practice not that is not comprehensive for effective planning of workplace ergonomics design.

The first challenge lies in gathering more specific industrial data to inform OSH guidelines, as well as consistent awareness-building initiatives demonstrating the advantages of ergonomics application. Ergonomics as a discipline of practice has not gone beyond basic knowledge
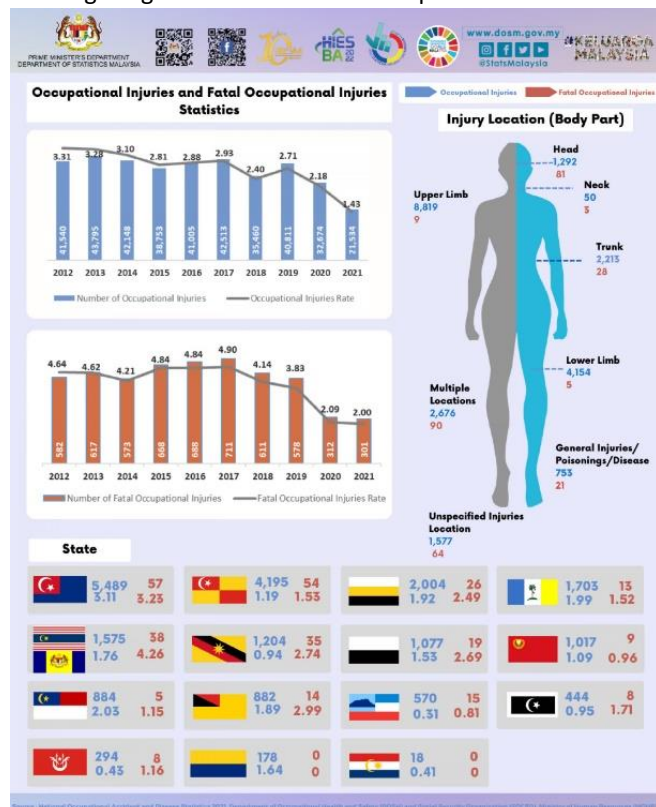
Figure 1: Statistics on occupational injuries and fatal occupational injuries by Malaysian states and location of
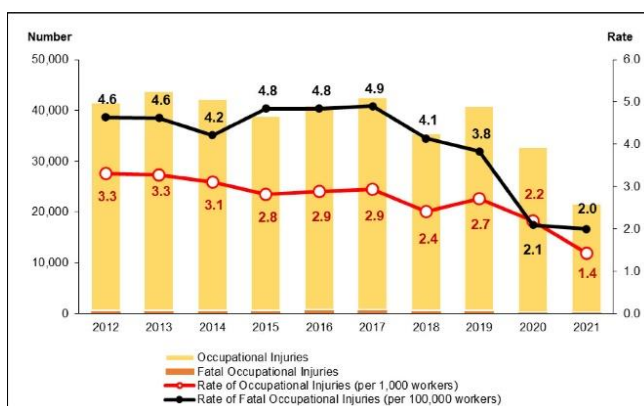
Figure 2: Statistics on the number and rate of annual occupational injuries and fatal occupational injuries from 2012-2021 (DOSM,

of minimum regulatory requirements and provisions such as the Occupational Safety and Health Act (OSHA) 1994 (Act 514), Factories and Machinery Act 1967 (Act 139), ISO 11228:2003 Ergonomics: Manual Handling for the prevention of musculoskeletal disorders (MSD), and SIRIM-approved designs.

Low Practitioner Participation

Ergonomics practitioners believe that unaddressed OSH issues decrease productivity and efficiency, compound safety risks, and compromise health, physically and

psychologically. SIRIM provides basic definitions of the minimum requirements for conformance to standards in ergonomics design as governed by the Standards of Malaysia Act 1996 (Act 549), but the prescribed approaches do not correlate with local benchmarking findings on OSH issues such as accidents, MSD, and injuries.

Ergonomics is a field noticeably less prioritised in Malaysia, with low practitioner participation in discussing benchmarking beyond conformance to standards. With hardly any channel for direct stakeholder input, it is not surprising there is lack of enthusiasm in the promotion and implementation of the non-mandatory guidelines, and many industrial professionals are unable to identify the economic advantages of ergonomics, or to associate the impact of good ergonomics design in developing a culture of sustainability through applications in enhancing efficiency while reducing costs to human.

Data insufficiency for post-pandemic recovery

Reviews of ergonomics literature published in industrial research journals in fields such as mechanical engineering and public health, detail the psychological and physical pain and discomfort from musculoskeletal conditions in sectors such as metalworks, plantation, nursing, teaching, manufacturing, office administration, and others. Several local and regional studies in the past applied basic frameworks to synthesise industrial policies with OSH legislation and emphasise professional training for occupational injuries management (Chan *et al*, 2011; Loo and Richardson, 2012; Rosnah Mohd Yusuff *et al*, 2016). The goal is to understand the role of ergonomics in achieving higher productivity, task concentration, lower strain, and protecting against OSH risks (Isa Halim *et al*, 2004; Khalid Amin *et al,* 2017; Noorhashirin *et al*, 2018; Shukri *et al*, 2020). However, these studies do not reflect one key national policymaking objective - to broaden awareness of ergonomics' sustainability.

In the post-Covid recovery, however, neither qualitative nor quantitative landmark studies have been produced by Malaysian public agencies to document the integration and relationships between sustainable ergonomics and productivity, with the shifts from physical to virtual and hybrid working modes during Covid-disrupted business closures. Without scholarly contributions, there are insufficient data insights to assist practitioners in strengthening policies on infrastructures, facilities, equipment, and product designs that meet the SDG Goal 3 of ensuring healthy lives and promoting well-being , and SDG 11 of making cities safe, resilient and sustainable. Only recently have ergonomics researchers begun critically examining the problems and solutions related to post-pandemic health issues including sprains and mobility-related injuries which disrupt work performance and efficiency. Current research suggests the potential to reach a wider sector of stakeholders including occupational rehabilitation services with high-tech facilities.

Conclusions

Malaysian practitioners must emphasise ergonomics as an applied branch of environmental science while adapting its approaches to align with the SDGs. Malaysia's attainment of developed nation status should consider SDG indices of healthcare and wellbeing, and to improve perceptions of local industrial and services sectors' commitment to ergonomics while satisfying sustainability goals of resource efficiency and environmental concerns.

Ergonomics form a valuable indicator of national wellbeing, but current standards that measure behavioural outcomes of occupational safety and health in the post-pandemic economic recovery period must be reviewed by the technical committees involved in policymaking. Improving public awareness enhances ergonomics design capacities to meet the nation's overall economic and social goals. This enables practitioners to create better environmental conditions in which ergonomics design can be adapted to fulfil users' needs, increase productivity, reduce, or lower risks to safety, while addressing material sustainability as end-goal solutions.

Recommendations

The following recommendations discuss how to create a chain of custody to strengthen current policies and guidelines, improve public awareness, and enhance understanding of sustainable ergonomics.

1. Five step approach for ergonomics design planning

A five-step approach is recommended to improve current ergonomics guidelines, with materials, strategies, and techniques that integrate human-centred design (HCD) principles, while considering affordability, economic, and environmental sustainability. Essentially, these steps must:

- Identify why ergonomics design planning is critical.
- Describe the issues, settings, and environment that affect occupational health and safety management for stakeholders.
- Assess and understand the scope of ergonomics design issues including low public awareness towards occupational risk factors and design affordability.
- Strategise ways to cope or resolve occupational risk problems which considers environmental and economic sustainability objectives.
- Recommend ways to change industrial perceptions with higher stakeholder participation.

2. Review ergonomics standards periodically

Periodic meetings among the technical committees involved in policymaking is recommended among standards practitioners, authorities, and relevant public agencies. Meetings are necessary to review and update current ergonomics standards implementation to address industry-specific OSH issues. Committees representing governmental, industrial stakeholders can help change public mindsets beyond conformance to local regulations.

To increase standards awareness, they must regularly publish findings on sustainable ergonomics design assessment standards, and how newer ergonomics design solutions incorporating smart technology can be sustainable, viable, and affordable while positively impacting the safety, wellbeing, and health of employees in Malaysian industrial, institutional, and service sectors in the post-pandemic recovery era.

3. Foster awareness with industrial-public sector collaborations

Sustainable ergonomics awareness needs to be promoted through encouraging stronger participation among stakeholders through more collaborative industrial and public sector programmes and initiatives organised by agencies such as Malaysia's Social Security organisation (PERKESO), a department under the Ministry of Human Resources Malaysia set up to implement the Employees' Social Security Act 1969 and other employee welfare regulations.

One eminent initiative where the benefits of ergonomics can be demonstrated is at PERKESO's Neuro-Robotics Rehabilitation Centre launched in 2014 in Melaka (pictured, right). Programmes can promote its facilities incorporating high-tech ergonomics design which enhance the quality of occupational rehabilitation services for PERKESO member employees recuperating from work-related accidents, injuries, or dealing with neurodegenerative health conditions.

About the author

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Flooding risk app will help save lives and allow for improved disaster management

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Summary

Flood victims and those people in zones prone to flooding need a better solution to overcome the effects of the devastation. A flood mitigation application provides a great avenue for both victims and rescue centres to communicate and take precautionary measures in a crisis to minimise the effects of the flood.

Introduction

Last year, the Emergency Event Database (EM-DAT) recorded 432 disasters it categorised as 'catastrophic', flooding accounted for the majority of these with 223 incidents (CRED, 2022). The numbers of disasters have soared compared to the average flood incidents of 163 from 2001 to 2020. India witnessed a series of devastating floods from June through September 2021, during the monsoon season, that resulted in 1,282 fatalities (CRED, 2022).

Severe flooding occurred in Henan, China, in July 2021, costing more than $16.5 billion USD, caused 352 fatalities, and affected a population of 14.5 million. At the same time, 260 people perished in Afghanistan's Nuristan floods. The second-most expensive disaster, The Central European floods, and associated landslides, in the same month, cost the German economy $40 billion USD (CRED, 2022). Raising awareness and taking precautionary actions on flooding are needed as an imperative public safety measure.

Key messages

- **Raise awareness of the effects of flood.**
- **Implementation of a one-stop flood mitigation application to minimize the effects of flood.**
- **Government should implement this application policy globally.**
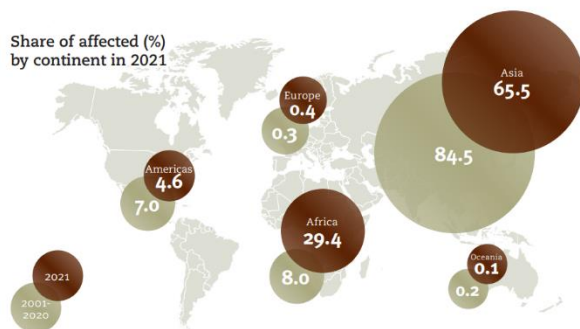

Figure 1: Human Impact from Natural Disasters (CRED, 2022)
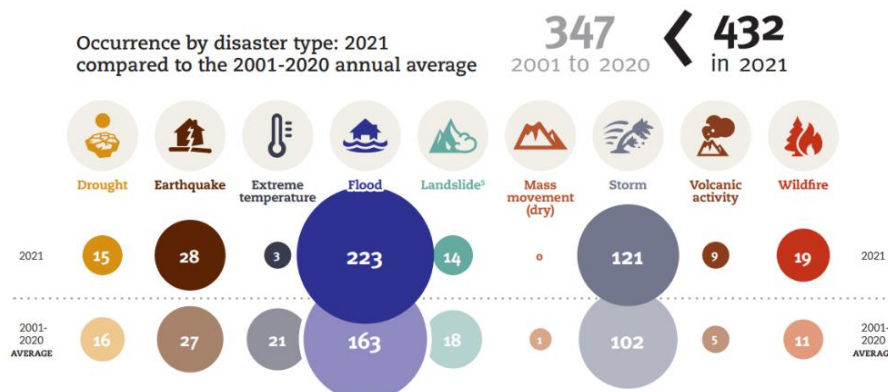
Figure 2: Occurrence by disaster type (CRED, 2022)

About the project

Figure 3: Flood app main screen
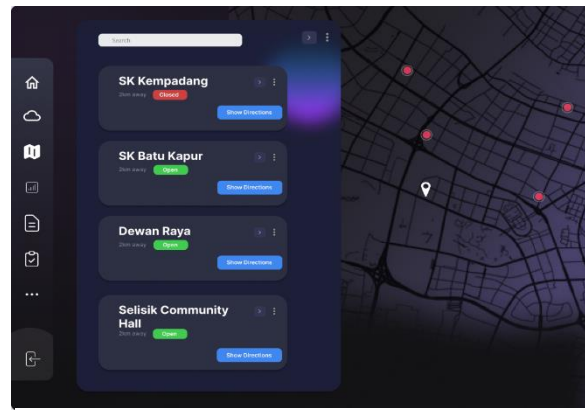
Figure 4: List of relief centres

This app will be an aid to flood mitigation giving all the information people need in one area. It will bridge the gap between flood mitigation awareness and swift mitigation procedures. The app provides an array of services for residents in flood-prone areas to prepare in advance in the case of disaster.

The aims of this project are:

1. To mitigate the flooding effects by producing a one-stop platform whereby relief centres and victims can communicate with one another during flooding.
2. This will save resources, such as manpower, time, food, drinks, and the app will include the evacuation centres allocated for victims during flooding.
3. Educating and raising awareness of the dangers to the public in flood-prone areas in a bid to minimise damage and the likelihood of fatalities caused by flooding.
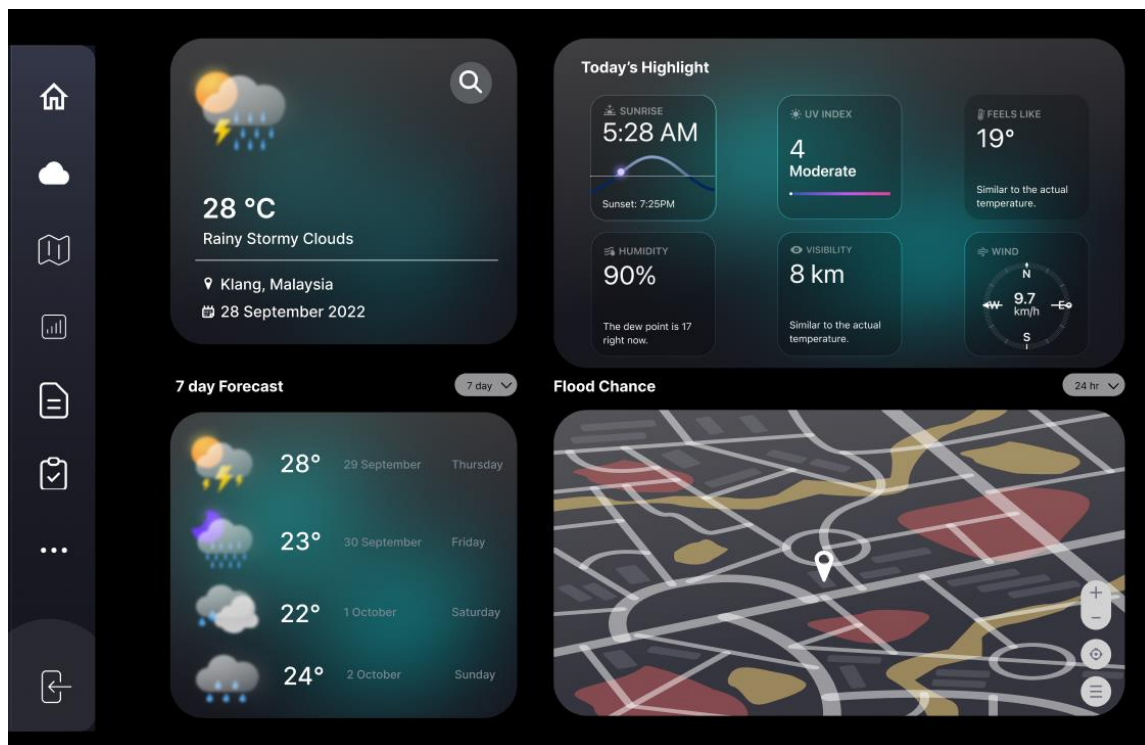
Figure 5: The weather forecast part of the app

The impending dangers will be explained by a weather forecast page to provide more insights for the residents on why the app has concluded that there is a high chance of flooding within their areas.

The app will also provide a list of relief centres that the public can go to at times when there is a risk of serious flooding in their area. Once a flood occurs within the person's location, the app will route them to their nearest relief centre, even if there is an electricity outage.
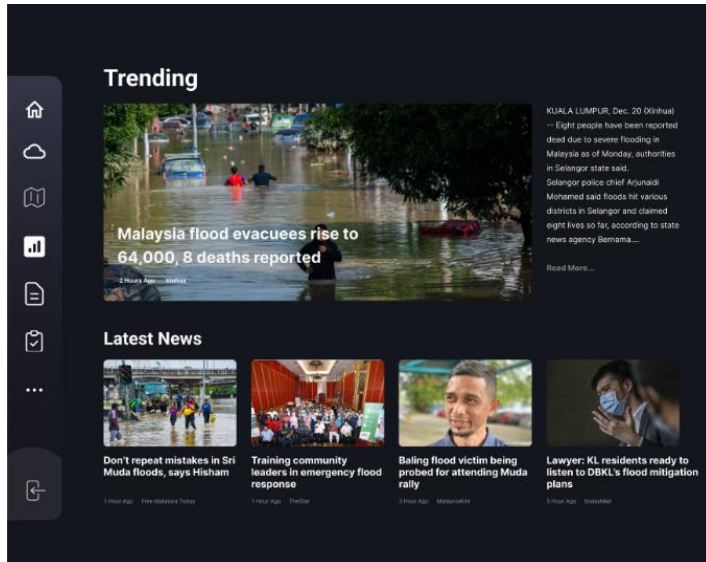
Figure 6: The news page of the app to keep people informed

Sometimes, people might not be able to carry all their important documents with them to somewhere safe. This app provides cloud storage for them to upload their important documents into the application.

To ensure that all people are aware of the current flood situation, a news page is provided to increase awareness. When a flood is predicted to occur, the application will display procedures, checklists, and guidelines for citizens to follow and prepare before flooding happens.

For the relief and response centre agents, they will be notified of the areas that will be flooded including its severity to ensure enough resources are prepared and allocated to assist victims. This should help to effectively mitigate flood impacts. When a region is starting to flood, the
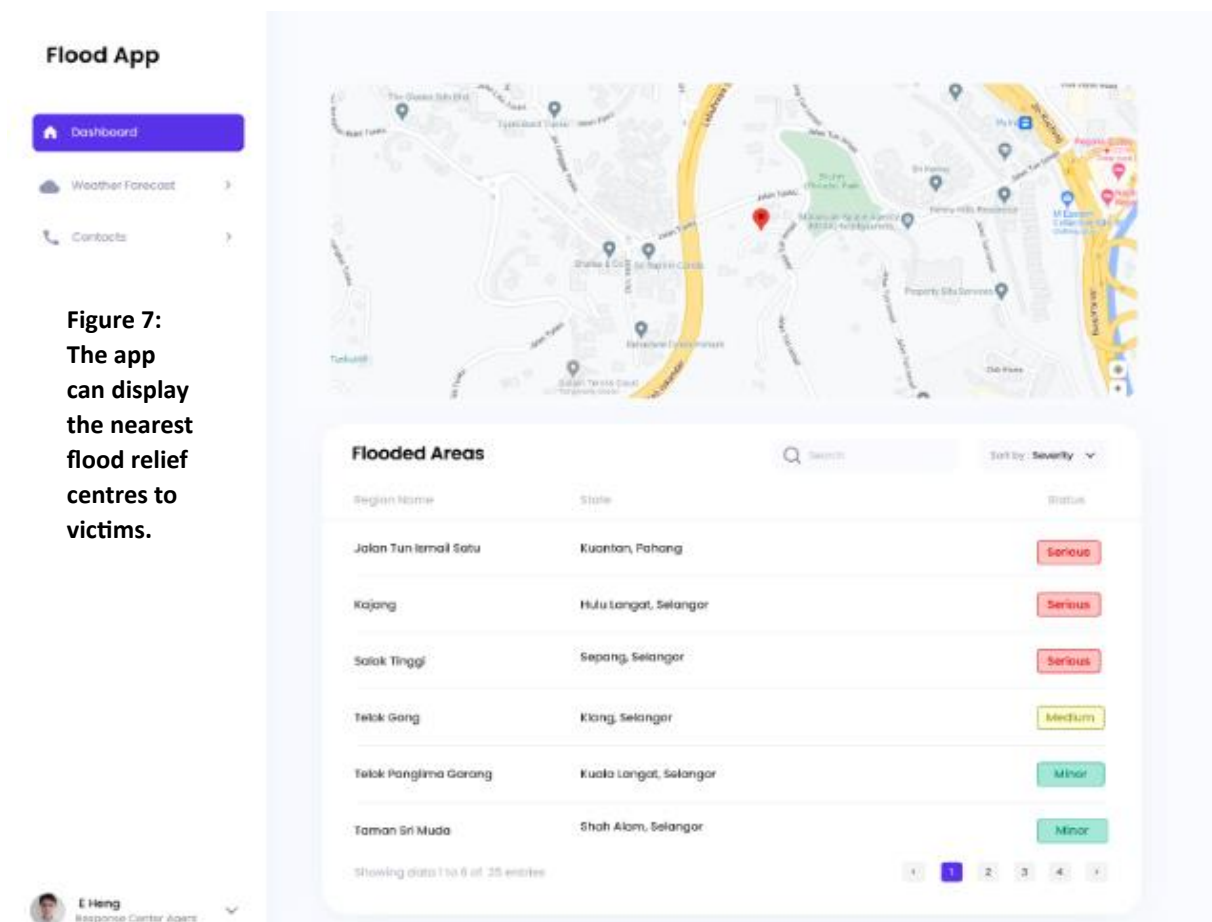
Figure 7: The app can display the nearest flood relief centres to victims.

response centre agents will be able to direct help to the areas that are most severely affected ensuring all resources are allocated adequately and efficiently to save the lives of as many people as possible in the devastated area.

Results, conclusions, and recommendations

This flood mitigation app has been shown to very useful in educating and raising awareness among the public on ways to prepare before flooding, and also the actions to be taken during flooding. It has the added benefit of improving the current flood management system of rescue centres with the time-saving allocation of resources for the victims. This should reduce the effects of flooding and number of flood fatalities. This user-friendly app will be free for users to download, register and use daily. Therefore, policy makers can implement this flood risk management and awareness app policy to the public at no cost, mitigating the effects of flooding for both the public and rescue centres.

Recommendation: Governments should implement this app policy globally

The participation of governments in this project is vital as they play a huge role in allocating resources during natural disasters. With the government considered as a stakeholder, all stakeholders are in one place and resources can be allocated wisely, and time can be reduced to save as many people as possible

About the authors

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Improving the outcomes for families affected by parental mental illness

Scott Yates and **Lina Gatsou**, De Montfort University Leicester, United Kingdom

Summary

Our work demonstrates the need and the potential for multi-agency frontline services, mental health services, and schools to work collaboratively with children, parents, and whole families to improve mental health outcomes.

Training based on our Think Family-Whole Family Programme can help services to identify families needing support; work with families to improve mental health literacy; intra-family communication and family relationships; and develop supportive environments that reduce stress and the burdens of their illness.

Key recommendations

- 1. Improve awareness of parental mental illness (PMI) in education, health, and social services.
- 2. Train frontline workers in collaborative whole-family work.
- 3. Ensure services support such whole-family work around PMI.
- 4. Improve resources and information for schools, parents, children and young people.

Introduction

Parental mental illness (PMI) is a signifiant but under-recognised public health issue in the UK and across the world. Approximately 68 per cent of women and 57 per cent of men with mental health problems are parents[1], and 23 per cent of children in the UK have a mother with a mental illness, with the incidence being higher in more deprived areas[2].

Most families where a parent has a mental illness cope quite well, but for a significant number, especially those facing other sources of stress, the illness can make family life more challenging and raise the risks of negative outcomes. Children of parents with PMI are overall more likely to develop mental health problems of their own, and to experience other emotional, social, and academic difficulties[3].

There is also a significant population of young carers who care for a parent with a mental illness. The demands of this caring role allied with the unpredictable progress of mental illness can bring additional burdens and uncertainty[4]. Unwell parents are also more likely to find parenting more difficult and to report difficulties in their relationships with their children[4].

Despite the significance of these issues, PMI is still not well understood, identified, or supported in frontline services that work with children, parents, and families[5]. There is an urgent need to improve practice in this area.

About the study

The Think Family-Whole Family Programme was initiated as a collaboration between De Montfort University and Leicestershire Partnership NHS Trust (LPT), with the input of world-leading external advisors, stakeholders, and service-users, to transform practice in frontline services and improve outcomes for families who had a parent with a mental illness.

Beginning with NHS funding in 2011, this programme set out to address two key gaps in knowledge and mental health service provision - the lack of research establishing the means by which PMI has a negative impact, and the lack of practice-focused research, reflected in the lack of family-focused interventions for working with PMI.

This initial phase saw the development of our research-based Think Family-Whole Family training intervention, comprising:

1. A programme of awareness-raising, education, and training for multi-agency professionals into the nature of PMI and its impacts on families.
2. An eight-session intervention protocol.
3. Research into how PMI affects families in contact with health and social care services, how current practice works with these families, what families need, and how practice can be improved.

This programme was refined based on emerging evidence and delivered to all Early Help Service workers and Support Families workers in the Leicester City and Leicestershire County local authorities. In 2018, we adapted it to train teachers and pastoral staff in schools to improve how they identify and respond to the needs of pupils with a parent with mental illness. To date, training has been delivered to more than 250 professionals who work with families, including staff at more than 70 schools. This gives the project a potential reach of 3,000 families and more than 24,000 school pupils. We also audited local mental health services to explore how PMI was recorded and assessed[6].

Findings from our research and evaluation were fed back to services to improve their practice and their impact on families' lives and were presented to strategy forums and meetings across LPT that led to changes in operational strategy and staff training. A Think Family steering group was constituted by LPT in June 2014 - a cross-departmental group to raise awareness of PMI and ensure support for families across the trust's services. Principles underpinning TFWF were incorporated into LPT's 2014 Families, Young People and Children Divisional Action Plan, and changes were implemented to embed PMI support across the trust's services.

TFWF principles were embedded in mandatory training for LPT's health visitors and school nurses from September 2013. This was expanded in summer 2014 to include multi-agency training for all staff. This allowed staff to carry out targeted visiting for families needing support around PMI. From 2019, our evidence was incorporated into mandatory safeguarding training for LPT's mental health services, GPs, consultants and registrars, and doctors. We collected quantitative data and qualitative testimonies from professionals and families to monitor the impacts of the programme and the needs for future development.

Results and conclusions

Prior to our intervention, services were not identifying or working with PMI consistently, and were not including all family members in their work. Most commonly, younger children were left out. Our results show that positive impacts on individual and whole-family well-being can be made where services work with whole families to promote understanding of mental health and mental illness, and foster communication and goal setting within the family. However, many frontline staff lacked confidence and skills to work with whole families and to engage with PMI, and services worked to narrow targets and were not configured to undertake work that includes whole families. Awareness-raising and training for both frontline staff and service managers was shown to enable changes in the focus of work and working practices to support effective work with families with PMI to improve their wellbeing

Recommendations

1. Improve awareness of PMI in education, health and social services

Improving services' awareness of PMI and their understanding of its impacts had positive effects on how well it was assessed and incorporated into their working practices (see graph below).

2. Train frontline workers in collaborative whole-family work

When professionals who work with those in families with PMI it facilitates collaborative and supportive whole-family work using the Think Family-Whole Family programme, both professionals and families themselves reported improvement in family relationships, well-being, and mental health. The evidence base for whole family psychoeducation and family therapy supports its wider implementation.

3. Ensure services support whole-family work around PMI

Services often work to specific targets that do not include family mental health, and pressures on client throughput can undermine engaged whole-family work, even where this would have positive benefits for families and knock-on impacts related to services' core targets

4. Improve resources and information for schools, parents and children & young people

Whilst there has been recent emphasis in schools on pupil's mental health, the impacts of PMI on their lives and their education is still not well-addressed. Schools can play an important role in the support of children and young people and their families and the provision of information and resources to enable a better understanding of PMI and improved help-seeking.

Assessment and support for PMI in mental health services audited pre- and post-training
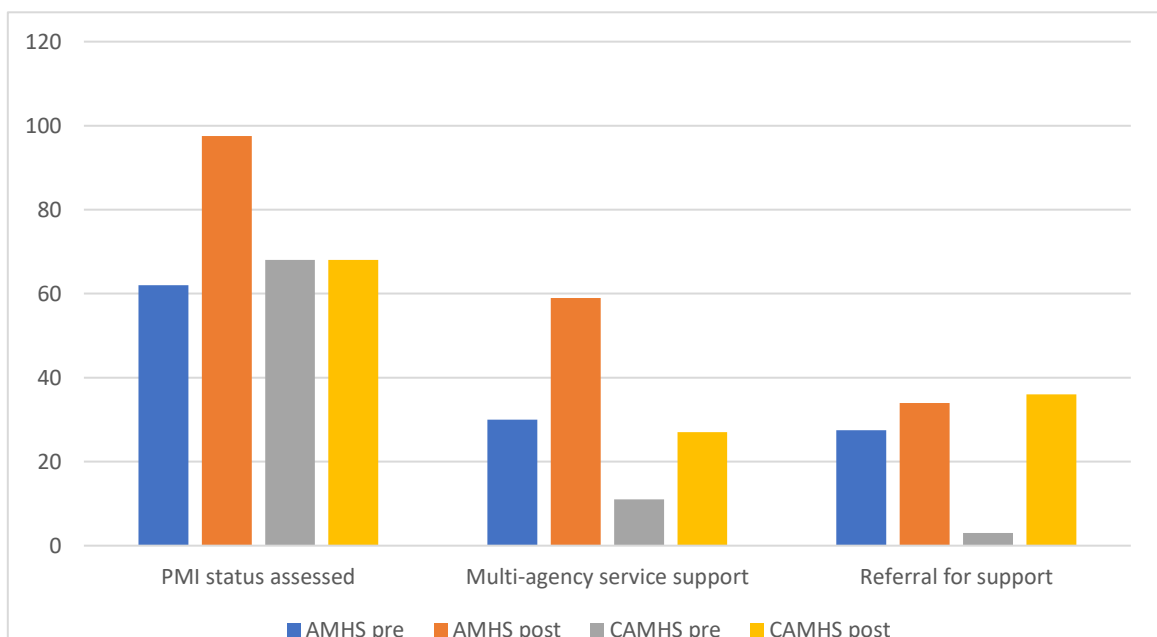
About the authors

Scott Yates is an Associate Professor in the Division of Social Work and Youth & Community Development. He has researched and written widely on health and illness, disability, and education and employment, especially as they affect young people and their families. His most recent research focus is on mental health and mental illness in families.

Lina Gatsou is Honorary Professor and Consultant Child and Adolescent Psychiatrist and Psychodynamic Psychotherapist for Children and Adolescents. Her special clinical interest is mood disorders, particularly child and adolescent depression, personality disorders, attachment disorders and safeguarding of children and families. Her academic interest is in developing interventions for prevention of mental illness and early intervention with children, young people, and families, especially in families with parental mental illness. She has written specialised CAMHS and safeguarding reviews, protocols and procedures, policy and strategy papers, clinical audits, and papers in peer reviewed journals.

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Rounded knives campaign would help save the lives of many around world

Leisa Nichols-Drew, De Montfort University Leicester, United Kingdom

Summary

Bladed weapons and sharp instruments are increasingly encountered in violent offences around the world, including street based and armed robberies, homicide, sexual assaults, and terrorism. Kitchen knives are the major contributor to this criminality, and also the cause of accidents within the domestic setting, often resulting in injuries and fatalities. This paper details a research study [1] that was undertaken using clothing garments, to investigate novel rounded knives in a stabbing motion, which concluded that no fabric damage occurred, compared to the significant damage caused by knives with pointed blades. These findings and recommendations will be of interest to international governments, law enforcement agencies, healthcare professionals, investigators of knife crime offences, crime-reduction units, charities, NGOs, knife manufacturers and practitioners, to share one mutual goal in advocating a safer alternative to conventional knife design.

Key messages

- **Promote the use of rounded knives as safer alternatives to hazardous pointed knives.**
- **Campaign governments to form legislation regarding the restriction of pointed knives.**
- **Engage with knife manufacturers and retailers to create and supply rounded knives.**

Introduction

Within England and Wales, there were 49,027 knife enabled offences in the year ending March 2022 [2], with more than 4,100 hospital admissions for assault by a sharp object. The UNODC 2019 Global Study on Homicide [3] reported sharp objects were responsible for more than 97,000 homicides worldwide, and more than 50 per cent of the total homicides in the following countries: Algeria, Azerbaijan, Bahrain, Bhutan, Cuba, Grenada, Guyana, Hungary, Kazakhstan, Morocco, Poland, Qatar, Singapore, Slovenia, Sri Lanka, and the United Republic of Tanzania. The UK Home Office Homicide Index recorded sharp instruments, including kitchen knives, as the most frequently used weapon for male and female homicides. [4] The United Nations is campaigning to end violence against women and girls, where statistics have shown the perpetrators responsible for more than 58 per cent of female homicides are known to the victim and the location is most likely the domestic setting. [5] Politicians, World Health Organisation, medical experts, the judiciary, clergy, and academics have collectively highlighted the issue of pointed knives, as being the primary factor in causing injuries and fatalities in stabbing incidents, whilst highlighting the necessity for preventative measures such as safer knife designs, increased educational intervention, and public policy change. [6, 7, 8, 9, 10, 11].

Research study

The aim of the research study was to investigate the comparison of conventional pointed knives with novel knives with different shaped tips. Four clothing garments were used - two upper (T-shirt, jumper) and two lower (jeans and faux leather skirt), which replicated typical exhibits submitted to the forensic laboratory and reflected the most targeted bodily areas in stabbing incidents (torso/trunk). More than 300 downward stabbing motions were conducted. Any resulting damage was photographed and measured for statistical analysis.

Results

The graph below shows the mean severance damage for each knife and each clothing garment. Both pointed knives: D (straight edged pointed) and E (serrated edged pointed) caused the greatest damage, followed by knives A and C. The only knife not to penetrate the garments was knife B (rounded tip) offering a safer alternative.

DAMAGE: Average damage length (mm) on clothing garments using knives with different shaped tips

The table, left, shows images of the damage from five knives on four clothing fabrics. The damage varies depending on the knife used. The most severe damage was produced by both pointed knives (D and E), resulting in pronounced openings in the garments. Knives A and C created small holes. Whereas knife B impacted the fabrics (this can be seen on the T-shirt and leather skirt), but the rounded tip blade failed to penetrate. The ability of a fabric to impede a stabbing action, could potentially offer protection in the event of a knife incident. By combining this information with the effect of knife tip shape, a 'hazard map' of knife and clothing combinations was constructed that ranges from very

limited (green) to very significant (red) damage. The rounded knife was rated as 'green', as none of the fabric surfaces were breached.

Conclusion and recommendations

A research study established a relationship between knife tip design and clothing damage resulting from the knife being used in a penetrating stabbing action. Conventional pointed tipped knives produced the greatest damage, whereas a novel knife with a rounded tip blade resulted in no significant damage to any of the garment fabrics. This suggests a clear alternative to pointed tip knife blades, offering an opportunity for crime reduction – a knife of culinary utility without the possibility of accidental injury, and with little or no value in violent crime.

Recommendation 1: Promote the use of rounded knives as safer alternatives to hazardous pointed knives

To educate communities with accessible age specific information regarding rounded knives as alternative culinary tools. Communicating research findings to the public in an open, transparent, and informative way.

Recommendation 2: Campaign governments to form legislation regarding the restriction of pointed knives

To encourage policymakers and stakeholders to create policies as a public healthcare and safety measure. Multi-agency involvement of health professionals, police, judiciary, charities; integrating expertise and influencing strategy.

Recommendation 3: Engage with knife manufacturers and retailers to create and supply rounded knives

To work in collaboration to share the goal of designing and providing safer alternatives to conventional pointed knives. Creating partnerships for changing blade tip design as proactive crime reduction and accident prevention opportunities.

About the author

Leisa Nichols-Drew is a Chartered Forensic Practitioner, National Teaching Fellow and an Associate Professor at De Montfort University Leicester. Leisa's expertise is in the forensic science laboratory evidential examination, recovery, and documentation of crime scene exhibits, from a range of knife crime offences. One of Leisa's subject specialisms is the analysis of clothing for severance damage or sharp force trauma, which can be used to identify the weapon or instrument responsible such as knives, screwdrivers, or scissors. Leisa's Churchill Fellowship has led to updates to UK police forces, and a submission to the House of Lords forensic science enquiry. This innovative research has been disseminated around the world, and was recognised with a collaboration award.

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Sustainability challenges for lower income community group projects in Malaysia

Cynthia Mala Paul Dorairaj, Asia Pacific University of Technology & Innovation, Kuala Lumpur, Malaysia

Summary

There is great concern for social community projects aimed at helping the lower income communities in Malaysia. With all the present economic challenges, organisations and countries have started to review their sustainability in their community projects and supervision approaches due to the lack of continuity or follow up.

Introduction

The problems faced by social community projects for the low-income earners in Malaysia are shown in the diagram below on the monthly income classification in Malaysia – 2,500 RM equates to just $547. Projects require huge funding to cater to the right target audience and a lot of time and effort is spend on making the projects successful. However, there is lack of continuity in the long term as most projects last for just three months. There is also a lack of commitment from the donors and the receivers.

Key recommendations

- **SDG 1 Maximise the utilities and resource available as source of sustainable income.**
- **SDG 2 and SDG 8 Creating small plantations by producing goods for their own consumption.**
- **SDG 3 Creating mental health awareness among the lower income areas.**
- **SDG 4 Donating recycling learning tools for the lower income public school and learning centres in rural areas and low-income living areas.**
- **SDG 17 Partnering with companies that have funds for Corporate Social Responsibility (CSR) and resources from NGOs.**

Income Classification by Household

Household Group		Median Income (RM)	Income Range (RM)
B40	B1	1,929	Less than 2,500
	B2	2,786	2,500 – 3,169
	B3	3,556	3,170 – 3,969
	B4	4,387	3,970 – 4,849
M40	M1	5,336	4,850 – 5,879
	M2	6,471	5,880 – 7,099
	M3	7,828	7,110 – 8,699
	M4	9,695	8,700 – 10,959
T20	T1	12,586	10,960 – 15,039
	T2	19,781	15,039 or more

Source: Household Income and Basic Amenities Survey Report 2019, Department of Statistics Malaysia

About the study

Recommendation 1: SDG 1 No Poverty

1 NO POVERTY

According to government statistics, the pandemic led to an increase in the share of Malaysian households living below the national poverty line to 8.4 per cent in 2020, following a record low of 5.6 per cent in 2019. Over the same period, income inequality increased slightly, continuing a recent trend after years of decline. Official statistics reported that the Gini index for total household income increased from 40.7 per cent in 2019 to 41.1 per cent in 2020.

For achieving and managing sustainability, there is an urgent requirement for skill, resource, knowledge, and organisational capability (Lund-Thomsen and Lindgreen, 2014).

Methods: Two projects have been extremely successful. In Kuala Lumpur, an HIV community, *pictured below*, were unable to find work due to their condition. In a collaboration with the Soroptimist International Club of Shah Alam, a non-governmental organisation (NGO), three goats - that amounted to RM600 – were donated for the group to rear. Over the years, this has multiplied to 300 goats that are used for milk and sold for meat. The community now has a source of income that is sustainable and the project has become a community activity. They have ample land and also manpower from the recovering HIV patients.

Another project, *also pictured below*, was at an orphanage and home for disabled children in Petaling Jaya, which caters for those aged between 12 to 16. The home had a baking room equipped with all the facilities and students from Asia Pacific University taught the children to bake and this has become their source of funding for the home during the festive season.

Recommendation 2: SDG 2 Zero Hunger and SDG 8 Decent Work and Economic Growth

2 ZERO HUNGER

8 DECENT WORK AND ECONOMIC GROWTH

The University of Bonn has developed a marginal abatement cost curve which shows that the G7 target of lifting 500 million people out of hunger by 2030 would require investment of US$ 11–14 billion per year. This could be achieved at the least cost through agricultural research and development efficiency, agricultural extension services, information and communications technology, agricultural information services, small-scale irrigation expansion in Africa, female literacy improvements, and scaling up existing social protections. To end hunger by 2030, investment of US$ 39–50 billion per year could lift 840–909 million people out of hunger. (Mullen.A, 2021)

Methods: The orphanage in Petaling Jaya had a lot of used land at the back of the house which was used for dumping rubbish. The students from Asia Pacific University

cleaned the area to allow for the planting of vegetables that can be used for their own consumption saving the home a lot on money on their food supply costs, with the extra produce sold to the nearest market and also a night market. A smaller area is being used to build a Aquaponic food production system for the home to have a constant supply of food. This is in a collaboration with the University Pertanian Malaysia as part of its research.

Recommendation 3: SDG 3 Good Health and Well-Being

Although the economy is on track for a stronger recovery, progress has not been experienced equally across Malaysian households. Findings from a recent survey showed that, in May 2022, nearly 60 per cent of households felt that they were not at all, or only partially able, to cover their basic monthly needs (Poverty and Equity Brief, 2022). This can be a form of mental stress which causes many to have mental breakdowns simply due to their lack of income to cover basic needs.

Methods: An NGO called Yayasan Health on World (YHOW) trained about 70 other NGOs in 2021 on Psychological First Aid to help low-income communities by motivating them in being financial independence. This initiative was by the Ministry of Health who gave grants for organisations with this type of expertise to run programmes for the community as a public service.

Recommendation 4: SDG 4 Quality Education

The growth in consumer electronics has also had an impact on the environment with the amount of electronic waste (e-waste) generated increasing year on year. This e-waste grew by around 21 per cent up to 2018. E-waste is a complex waste stream with many diverse materials from precious metals to plastics and presents us with many challenges as to how to manage, dispose, and recycle it.

Methods: Before the pandemic, the Soroptimist International Club of Shah Alam carried out a project by collecting used laptops from companies, which were disposing of their laptops and computers after five years but were still functionally. Around 40 laptops and 20 computers were collected over a period of three years and given to learning centres and schools in the low-income residential areas. To refurbish each computer and laptop the cost was RM80 and this cost was sponsored by the NGO.

Recommendation 5: SDG 17 Partnerships for Goals

Different types of organisations such as multi-national corporations, non-government organisations, and international governmental organization are faced with challenges to incorporate and work with partner organisations (De Lange *et al*., 2012).

Methods: A project with the indigenous community in Janda Baik was a collaboration with the HSBC Bank and Soroptimist International Club of Bangsar, who had funds for farming materials. The club had students who were able to help in the farming process and teach the children about financial literacy.

Recommendations

SDG 1: Maximise utilities and resources available as source of sustainable income

In any community service project undertaken, to evaluate the resources that are readily available and to fully utilise them, such as land and building space. This can eventually be a source of sustainable income in the long term.

SDG 2 and SDG 8: Creating small plantations to produce foods for their own consumption

Creating a plan to produce small plantations, which could be through vertical plantations or even Aquaponics, where the produce is used for its own consumption. If there is extra produce, this can be sold and will provide a sustainable income.

SDG 3: Creating mental health awareness among the lower income groups

Mental health is an issue for many, therefore, to collaborate with an NGO in creating a sound mindset for people makes projects sustainable in the long term and the project will be able to continue for some time.

SDG 4 Donating recycled learning tools for public schools and learning centres in lower income areas

By donating and recycling laptops and educational gadgets, this helps not only the children who are going to schools but also help the parents who are running a small business. The children are able to help set up social media for the families to run their business more effectively and sustainable.

SDG 17 Partnering with companies that have funds for Corporate Social Responsibility and using the resources from NGOs

By partnering with corporate and non-profit organisations that have funding, expertise, knowledge, and skill in making the project sustainable. However, resources such as land building and manpower, knowledge, and skills and expertise for the projects also need to come from the receiver. With the community help and funding from the organisation, the project will be sustainable, as shown in the graph below.

Developing a Sustainability Plan in Project Proposal (Eva Wieners, 2017)

About the author

Cynthia Mala Paul Dorairaj is a lecturer in the School of Business at the Asia Pacific University, Kuala Lumpur, and has been doing a lot of social work for the past 20 years with different learning centres and communities in creating a source of sustainable income towards the economic growth in Malaysia.

Acknowledgements

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Solar device demonstration will show how the sun can power clean energies of future

Anka T. Petkoska, **Fuad Khoshnaw**, and **Ilija Nasov**

Summary

The Photovoltaic-thermal (PVT) collector is a single device that produces clean energy in form of electricity and thermal energy. It has substantial advantages in performance over solar thermal or photovoltaic systems, separately.

Introduction

Fossil fuel energy is still the main source for covering energy demands that cause other environmental-economical-social issues. Many nations are adopting renewable energy sources (RES) as a replacement for fossil-based ones. A lot of ideas for devices and technologies that utilise RES were promoted in the last decades including solar energy as one attractive source. [1,2]. However, all the indications show that the global efforts are still not enough to combat global warming. Therefore, there is an urgent focus on actions to mitigate these emissions through switching to low-carbon and RES.

> **Key messages**
>
> - **Recommendation 1: Utiliation of renewable energy sources - solar energy as an indispensable source of clean energy.**
> - **Recommendation 2: Concept of PVT device – principles and potential for further improvement.**
> - **Recommendation 3: Experimental set up, measurements, data acquisition and results.**
> - **Recommendation 4: Promotion and dissemination activities.**
> - **Recommendation 5: Life cycle analysis case study of PVT.**

Solar energy is one of the best potential candidates to cope with energy crisis compared to others, due to low maintenance cost and the enormous supply of solar power coming for free from the sun. For example, only 60-90 minutes of sunlight striking the earth is enough to provide the entire planet's energy needs for one year. Solar energy, although abundant, represents only a tiny fraction of the world's current energy share, even though it has been one of the most accessible and affordable renewable energy technologies for the last few decades. Photovoltaics and solar thermal collectors are mature technologies that harness solar energy and could be further developed in terms of their efficiency and optimisation. [5]. There are a variety of devices that convert the solar energy into electrical or heat energy. The effectiveness of these devices is dependent on various factors, such as its geometry, photothermal to photovoltaic conversion, its position relative to sun rays, etc. [6]

The photovoltaic (PV) system consists of solar cells; they convert sunlight directly into electricity through the photoelectric effect, but the power output depends considerably on solar radiation, ambient temperature, wind speed, cell material, age, and stability of the PV. Solar radiation is converted into thermal energy in a solar system with the help of a working fluid; the performance of a solar thermal collector (ST) depends on design parameters and working fluids. Researchers have tested variety of fluids for this purpose, water and its mixtures, then nanofluids that significant increase the photothermal efficiency, for example. Despite the suitable properties of nanofluids, their dispersion stability is a key challenge for utilising these in solar collectors. [2,6]
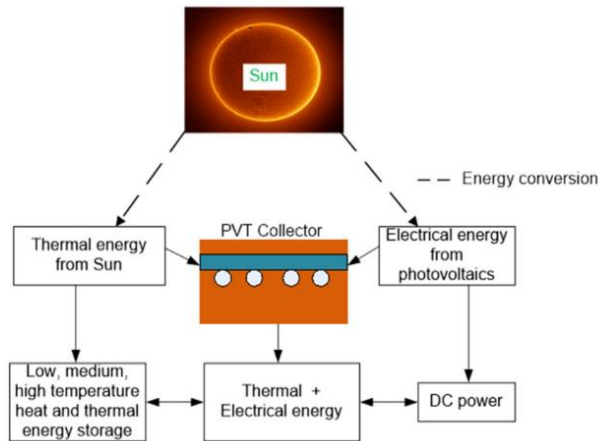
The photovoltaic thermal (PVT) collector consists of a typical solar PV module, integrated with a solar thermal (ST) collector (Figure 1, see left), which transfers the unused heat from the PV module to heat transfer fluid. The PVT system generates electricity using PV cells and thermal energy with ST adhered to PV module, simultaneously. PVT technology has been considered in many energy-system studies during the last four decades due to its ability to combine the advantages of photovoltaic and solar thermal collector technologies for electrical and thermal energy production. Photovoltaic efficiency is negatively affected by high temperatures, and hence, the PVT technology facilitates the cooling of PV cells for enhanced electrical efficiency. In addition, the extracted heat is used generally for low-temperature applications. The life-cycle and environmental analysis of PVT systems are usually examined through energy payback time and carbon dioxide emissions. Many studies reported better payback time for PVT over a separate PV and solar thermal collector. [5,7-13]

PVT is attractive from many points of view, e.g. for applications with limited space since it produces thermal and electrical energy at a reduced cost compared to a separate PV and thermal collector systems (PVT uses the same space and generated heat and electricity at the same time produced per the same area).

The study

The photovoltaic-thermal (PVT) collector is one of the technologies to produce clean energy which has been used due to their substantial advantages over solar thermal or photovoltaic systems, separately. Even though PVTs have been studied for a long time, their popularity is still not well-established in some industrial sectors. Applications of PVTs are in the relatively early stages and need a good deal of attention for large-scale applications. [2] This proposal aims to increase awareness of RES and their utilisation through demonstrating a prototype of PVT (~2 m^2 surface area) at the De Montfort University campus, Leicester. The same experience can be repeated at other campuses, in Dubai and Kazakhstan, to promote knowledge and research activities to the related programmes such as engineering, technical sciences, and sustainable energy. One device will be provided to DMU by Camel Solar-Skopje, from R. N. Macedonia.

SGDs: The benefits of the PVT system in meeting the UN
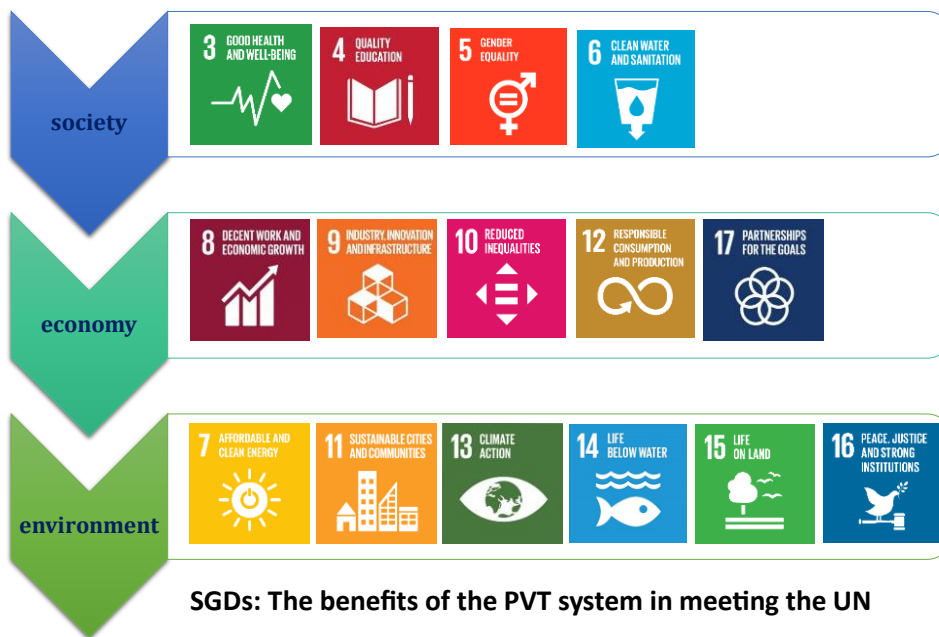
Results and conclusions

The project proposal deals with installation of the PVT device at DMU's Leicester campus. Students will have an opportunity to do practical analysis of the benefits of using free solar energy and transfer into electricity and thermal energy. The analysis will provide practical knowledge in addition to theoretical insights about a sustainable future. Students and their academic advisors will be directly included in on-site measurements and comparing data year-around in different seasons (e.g. summer-winter) and temperature variation (e.g. day-night). We believe that this hands-on experience and knowledge gained will contribute to an experienced young generation with an understanding of global trends in terms of sustainable community, better economic growth, dealing with climate changes, cleaner world (air, water, soil).

Plasma – the centre for plasma technologies – in Skopje (a company located in R.N. Macedonia) has agreed to give one PVT device to DMU, with the university taking the responsibility and the costs related to its transportation and installation.

The benefit for both sides encompasses extending the testing/evaluation of PVT collector in different climate regions (North Macedonia vs. UK) and collecting data for further comparisons. In addition, new studies could be performed that have not performed until now, such as a change of fluid type e.g. different mixture or experimenting with different nanofluids, then a combination with PCM (phase change materials, or combination with both nanofluids-PCM, etc). Moreover, focussing on a different applications of PVT collectors like desalination of water or to fit into net-zero energy buildings (NZEB) concept or other applications will be also considered. [15-22]

Recommendations

Utilisation of renewable energy - solar energy as an indispensable source of clean energy
Solar energy is one of the most used renewable sources between all unconventional energy sources. Suitable theoretical courses and dissemination materials will be delivered.

Concept of PVT device – principles and potential for further improvement
The PVT concept potential is already explained above. However, further improvements are possible. They are going to be performed at the origin place/facility but now it will be explained to the DMU campus as well.

Experimental set up, measurements, data acquisition, results
An experimental set-up will be established at the DMU Campus. Students and the academic staff will have the opportunity for close observations and of measuring the device's capability. At the same time, their creativity in improvement of the device in terms of characteristics or application could be established. Data acquisition and results of such observation will contribute to the hands-on experience beside the theoretical insights.

Promotion and dissemination activities
Through this work, there is a great opportunity to disseminate the PVT concept far from the place where it was manufactured. Preparation of part of the scientific work or thesis are all part of this activity. Further co-operation and installations of novel PVT devices could be possible following this example and later comparison for their efficiency, climate dependence, GHG reduction etc.

### Life cycle analysis – a theoretical insight for PVT case
Life cycle analysis (LCA) has not observed so far for the PVT. It is an opportunity for this study to continue to evaluate a few scenarios for PVT in terms of LCA, benefits for climate changes e.g. expressed through CO^2 emissions per kWh produced.

About the authors

Dr. Trajkovska Petkoska is a Full Professor at University St. Kliment Ohridski-Bitola, N. R. Macedonia. She has been involved in the development of a number of novel products, proprietary material formulations and cutting-edge technologies. She is the author and co-author of numerous peer-reviewed scientific articles, three books and eight book chapters. She has been granted two US patents and is co-inventor of several patents pending. Trajkovska holds a PhD from the University of Rochester, New York.

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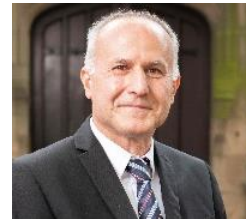
Dr. Ilija Nasov has more than 20 years experience in solar energy by conducting several R&D and innovative international projects. He collaborates with many institutes worldwide, and has leadership positions in many non-government associations and industries. He is a Doctor of technical science and Associate Professor at the solar energy department and was also Dean of Faculty for ecological resources, MIT University-Skopje. He is co-owner and President of the board of directors at the Camel Solar-company producing solar thermal collectors, and director and co-owner of the Center for Plasma technologies.

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Achieving the Net Zero 2050 commitment through green procurement by government

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Summary

Even though the Net Zero commitment target is still 27 years away, it requires the involvement of various key players and stakeholders to achieve long-term benefit in terms of sustainable economic growth. The idea of this brief is to look at how government green procurement guidelines in Malaysia can help organisations achieve a net zero economy and establish sustainable public procurement practices.

Key recommendations

- **Engaging a seamless transition by leaving no one behind.**
- **Strong reporting requirements and monitoring coordination.**
- **Establish a better capacity building.**
- **Provide more tools and incentives.**

Introduction

Public procurement is now no longer limited to purchasing the cheapest products or services. Alternatively, public procurement can be used to promote the Sustainable Development Goals (SDGs) framework, specifically focusing on the Target 12.7 – "to promote public procurement practices that are sustainable, in accordance with national policies and priorities". [1].

Malaysia is no exception with current active spending of at least RM616.8 million. Government green procurement (GGP) plays an important role in Malaysia's economic development [2]. Alongside this agenda, the Twelfth Malaysia Plan began to associate SDGs targets with the commitment of pursuing green growth and adopting sustainable consumption and production concepts [3].

We have only have one earth and only one country – Malaysia. In order to save our country, we need to reduce any environmental harm that has been caused at our own hands. However, a carbon-free planet takes a whole series of measures and cannot be done with one simple decision. Procurement is one of the entry level measures before engaging more in more efforts to achieve the Net Zero Commitment.

A carbon-neutral supply chain does not just happen — but it starts with procurement. The introduction of the Net Zero Commitment 2050 is nothing new. In pursuing a vision of becoming a low-carbon nation, Malaysia has set a long-term goal of being a carbon neutral country at the earliest in 2050 [3].

This effort includes collaboration in the main greenhouse gas (GHG) emitting sectors; namely energy, transport, industrial processes and product use, waste management, agriculture, forestry and land use. The ambitious commitment will further contribute to the SDGs Goals 7, 11, 12 and 13.
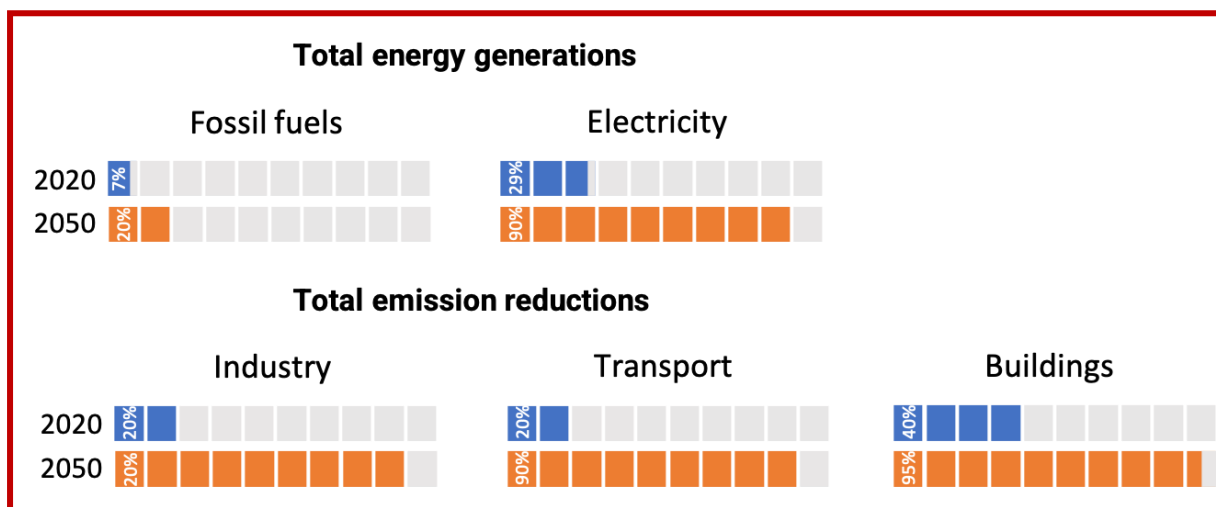
Government Green Procurement Guidelines

A well-designed national policy framework in Net Zero Commitment is necessary to facilitate the fundamental shift towards sustainable consumption and production patterns. Malaysia first published the government green procurement (GGP) guidelines in 2016 to encourage public organisations to incorporate environmental criteria in their procurement process [4]. As the global supply chain began to shift their product and service preferences towards sustainability and climate-aligned elements, Malaysia's organisations need to reconsider embedding a sustainability strategy to stay relevant in the industry.

GGP can be a strategic lever to achieve the Net Zero Commitment 2050 pledged in the Twelfth Malaysia Plan by managing the natural resources efficiently and, at the same time, enhancing the low-carbon initiatives in all industries [3]. With public procurement responsible for 15 per cent of global greenhouse gas emissions, it is critical that government procurement organisations determine

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Government initiatives to achieve Net Zero Commitment 2050

Introducing carbon pricing and carbon tax
To replace coal-fired power plants with cleaner power generation.

Initiating a new legal act on energy efficiency and conservation
To regulate energy consumption by high intensity consumers in the commercial and industrial sector.

Implementing a circular economy model
To reduce pollution, waste generation, and natural resources dependency.

Coordinating the Green City Action Plan
To develop environmentally-friendly mobility systems and comprehensive climate change mitigation.

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their emissions baseline, set targets, and define the product and service standards needed to reduce their contribution to global warming. At the same time, the cost over time of the net zero pledge will boost green economic growth with plenty of new job offerings and consequently contribute to a healthier society.

Through GGP, apart from the existing product group that can lead towards sustainability, identifying the main contributing sectors of GHG emissions is important, such as steel, cement and concrete production, heavy transport, electricity and the construction process. Besides that, it would also be a better solution to consider new product or model innovation solutions at the early stage of technological changes. Box 1, *see below*, illustrates the five main sectors that contributed to the GHG emissions in 2020 and their target by the year 2050 [5].

Total energy generations

	Fossil fuels	Electricity
2020	7%	29%
2050	20%	90%

Total emission reductions

	Industry	Transport	Buildings
2020	20%	20%	40%
2050	20%	90%	95%

Conclusions

To ensure that the market is ready to move towards Net Zero Commitment 2050, a significant transformation within the procuring organisations must take place and be aligned with other agencies. Considering the spending power of public procurement, a great extent of influence to combat global warming through public purchasing can be achieved across various sectors. Over time, the reasonable cost and benefits will not only reduce carbon emissions, but also enhance the green economy, offer more job openings and lead to a healthier community.

Recommendations

There are four recommendations proposed to be taken as part of achieving the Net Zero Commitment by Malaysia through the GGP framework:

1. Engaging in a seamless transition by leaving no-one behind

After five years of implementation, it is now time to work on the harmonisation of GGP's framework to facilitate the product group that can help the nation to achieve more low-carbon products amongst local manufacturers and suppliers. A better alignment across the nation through on-going engagement with all key players, industry movers and academia

2. Strong reporting requirements and monitoring coordination

A strong reporting format should also align together with the compulsory measure to easily demonstrate the actual implementation status by the participating organisations. The Government should develop a user-friendly reporting format that leverage on the existing global standards with common assessment tools and can be further modified according to different implementing industries or sectors.

3. Establish a better capacity building

Develop an inclusive training programmes which value skills of managing net zero in procurement. At the same time, increase the awareness campaigns on net zero procurement through the three Rs concept of reusability, repairability and recoverability.

4. Provide more tools and incentives

To scale up current implementation, the Government can offer the participating companies various tools and incentives, such as capacity building, financial aid or even additional tax exemption. By approaching a wider market, this effort will be able to create more industry coalitions for a low-carbon products and promoting decarbonisation - the "carrot and stick" approach.

About the author

Nur Faiza Ishak is a research associate at the Integrated Sustainability and Urban Creativity Research Centre, Asia Pacific University of Technology and Innovation, Kuala Lumpar, Malaysia. Her research interest includes work on the Sustainable Development Goals, public procurement and Government green procurement.

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'Overlooked' young people must be crucial actors in creation of peaceful communities

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Summary

Young people, school, family, and community engagement is critical to addressing the community challenge of youth conflict and violence in contexts of high marginalisation and vulnerability. Young people are crucial actors in this, yet their contributions towards peaceful communities in schools and beyond are often overlooked. Using an innovative approach to school-based work and community work, the central aims of this project were to explore how young people understand and enact peace as part of their everyday life, and to strengthen cohesion between young people and different stakeholders and communities in response to the community challenges of youth peace, violence, and conflict.

> ### Key recommendations
>
> - **Understanding and involving young people.**
> - **Moving from concepts to peace-Informed practice.**
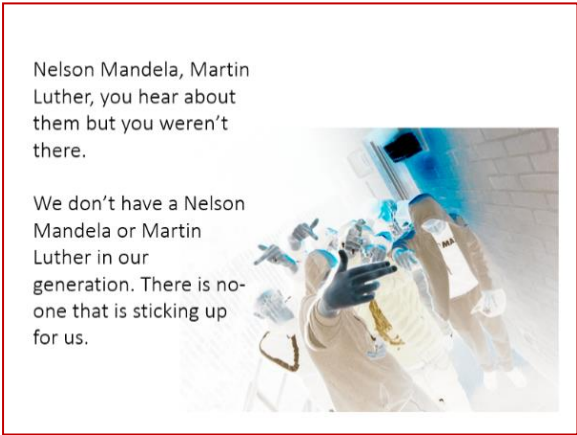> - **Prioritising research-informed practice.**

Introduction

School, home, and community are often not 'safe spaces' for many young people (YP) in England as they experience direct violence, marginalisation, and conflict (Ogunnusi, 2006). Evidence shows that "schools make ideal environments to challenge…harmful social and cultural norms...that tolerate violence towards others" (WHO 2019:2), this involves the type of "peace education [that] may shape any or every experience in school … while recognizing the many rich opportunities that formal schooling allows for informal learning" (Cremin & Bevington, 2017); and "that school and education-based approaches are effective in reducing youth violence" (Russell 2021:7). Yet, there is little research in England on how teachers, parents, and educational leaders outside school, can work with YP and the local community to collectively respond to issues of peace, conflict, and violence. Crucially, even less is known about how YP position themselves in relation to peace, and the ways they contribute to everyday peace in their lives and communities. Evidence suggests that engagement with YP is critical to address the community challenge of youth conflict and violence; and that participative methods can create opportunities for those who most experience violence (direct, structural, or cultural) to become an active part of the solution. (Ogunnusi, 2019, 2000, 2021)

About the study

By combining research and research-informed practice, the Young People Peace & Change project aimed to explore how YP in England understand peace in their everyday life, and what they do with this knowledge; and to encourage YP's solutions for peace in their communities. This work actively sought to foreground the voice of YP and apply new knowledge to existing collaboration practices for teaching and learning with YP, students, teachers, and practitioners in the community.

Data gathered longitudinally over two and a half years showed for the first time how YP in England understood peace as a tool of analysis for social change be this philosophical or practical; and what this means for their everyday life. Photovoice (PV) was used effectively with 21 YP, in five inner-city settings, to record and reflect their community's strengths and concerns and to promote critical dialogue and knowledge about important

> Nelson Mandela, Martin Luther, you hear about them but you weren't there.
>
> We don't have a Nelson Mandela or Martin Luther in our generation. There is no-one that is sticking up for us.

issues through group discussions of photographs (Wang and Burris 1997:369). YP clearly understood peace as representing more than the absence of violence and conflict, and they highlighted a disconnect between "lived" peace, and the significance of change and peace. Findings further demonstrated how YP developed tactics to shape and navigate peace in their everyday life, including school and the community influenced by ideas of equality, respect, and social justice; and what this meant for their relationships with themselves and others. YP also took action for peace, seeking a community response, based on their own concerns and aspirations; explicitly expressed as a gesture towards social change in their immediate environment that included a collective hope to disrupt the consciousness of their audiences by opening a dialogue about what is known, or assumed about peace (Ogunnusi, 2000: 192). This resulted in youth-led community engagement in different contexts of high marginalisation and vulnerability.

In summary, the project: (1) shed light on the ways YP understands peace in the continuum of structure and agency in the minutiae of everyday life, and what this means for the conceptualisations of peace in peace studies. (2) Evidenced how YP's knowledge of peace contributes to peace, and what YP do with what they know, which is rarely documented longitudinally. And, (3) methodologically, an original approach to PV influenced by Participatory Action Research, theoretically rooted in dialogue that seeks to problematise and act in the world, enabling genuine opportunities for participation - creating a safe space for self-introspection, dialogue with peers, and for action, engaging communities, and connecting with wider audiences, to "speak back" with the research. Additionally, YP reported having increased knowledge, self-confidence, and increased skills for group work, collaboration, decision-making, problem-solving, critical thinking, and critical analysis, such as making links between personal and political.

The study has shown great potential for replicability and local engagement with significantly marginalised or at-risk communities, whom themselves recognised trends by which they were ignored or misrepresented as youths. Working towards community-based change within schools and the broader community, the learning from the project continues to inform opportunities for YP and adults to actively share their ideas and solutions for peace, promoting knowledge transfer to develop the capacity of teachers, youth workers, and educational leaders beyond the school walls, for everyday learning and teaching practices. This work has also been shown to play an important role with YP at risk. (Ogunnusi 2020; 2021)

As one example, learning from the Young People Peace & Change project has contributed towards the MinusViolencePlusPeace and Positive Peace programs facilitated with Peacemakers (WMQPEP) in 14 schools since 2018. This work was originally developed in response to funding from the Home Office, and later from the West Midlands Police and Crime Commissioner, to work with young people and schools in response to youth violence in areas of high marginalisation in Birmingham. To conclude, research aimed at furthering social justice with marginalised communities, that aims to serve those communities, such as YP who are underrepresented, misrepresented, overlooked, vulnerable, or at risk of violence, can be a valuable tool in educational, youth, and peace work.

Results and conclusions

It is commonly understood that young people have a right (and a need) to learn peace, and to live peacefully (UNESCO, 2002); and that learning peace and finding ways to 'do' peace, can be beneficial for those involved. Yet, YP remain disproportionately vulnerable to violence, and the evidence suggests they feel disconnected from "lived" peace. Evidence for the Young People Peace & Change project suggests that through a learning process in the context of research YP have(re)worded and (re)known peace as part of their social existence, and so come to understand and enact peace more often. More specifically, the findings have illustrated how YP have given meaning to peace (through their own words, photography, group dialogue, and action), as something situated and contextualised in ways that are deeply experiential, placed, non-reductionist, visceral, observable, temporal, routine, culturally significant, set within the continuum of praxis in their everyday life. Generally, our knowledge of peace needs to be studied more, promoted more, and critically reframed.

It is vital that practitioners become "peace-informed" with young people in a way that is informal, and responsive and flexible; building on what the young people introduce at the time, as well as drawing from existing theory, methods and 'curriculum' (Ogunnusi, 2021). Such work can be supported by independent learning about peace theory that carries important messages about the normalisation of violence, transforming conflicts of different types, managing conflict non-violently, and "positive peace". Advancing peace-informed practice may also require identifying foundational knowledge, foundational skills, scaffolded by coaching and supervision, and collaboration and partnership working (Ogunnusi 2021). At an organisational level, being more peace-informed may involve reviewing mission and vision statements, organisational practices and code of ethics, reviewing organisational capacity (training, curricula, and practice), potential partners, networking and outreach strategies, and impact/evidence (Besseling *et al,* 2014).

The process and findings of research have been shown to be inextricably linked to educational practice; defying the idea that research is only for researchers and that it is too burdensome or complicated for educators. In keeping with a PAR approach, YP in the project have taken action for peace seeking a community response; and learning from the project has been used to develop a greater understanding of peace and conflict for YP, students, teachers, youth workers, and educational leaders. These examples of knowledge transfer can help those involved to be better equipped to engage positively in the community in schools and outside the school walls.

Recommendations

The six recommendations below are intended to help you reflect on your own position, and how the work you do might strengthen young people's knowledge and experience of peace. Each one can be responded to with carefully co-ordinated training and support activities.

Understanding and involving young people
1. Identify how you/your organisation understand young people and their behaviour with regards to peace, conflict and violence, including young people who might be marginalised or at risk of youth violence.
2. Critically assess if your practice informs or tests your existing knowledge about young people and peace, conflict and violence; and the extent to which this knowledge is co-created with young people.
3. Create regular opportunities to discover and discuss young people's lived experience of peace, conflict and violence, including how they contribute to everyday peace, and what helps them to manage violence and conflict.

Moving from concepts to practice
4. Research and define how your practice can be (more) "peace-informed", and what it would mean to be "peace-informed" at an organisational level.
5. Evaluate how you/your organisation understand some of the complexities of "genuinely" engaging young people, making contact and encouraging active participation, with a view to building involvement and responsibility to strengthen young people's peace.

Prioritising Research-Informed Practice
6. Develop research opportunities and research-informed practice to further understand how to thicken young people's agency and support them as social actors for peace in school and the community.

About the author

Michael Ogunnusi has award-winning expertise in Photovoice and successfully completed his doctorate in 2020 focused on how young people understand and take action for peace in everyday life. His interests include replicable methods for youth voice, action, and impact, and how participation strategies for how young people can become an integral part of organisational culture, programmes, and providing. An experienced and qualified youth and community worker, and social worker, Michael joined De Montfort University's Youth and Community Division in 2009. His background also includes civil rights work and police monitoring, research, and advocacy with children in care. Michael continues as an experienced youth worker and peace educator, with more than 20 years of experience.

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Municipal solid waste can supply fuel to bioenergy plants of urban Malaysia

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Summary

Municipal Solid Waste (MSW) is ubiquitous wherever human beings reside. If it is not managed well, it could prove hazardous to human health as well as to the environment. A comprehensive MSW management scheme would address these issues and could concurrently contribute to bioenergy production.

Key messages

- **Enforce key collection points.**
- **Enforce rigorous waste segregation.**
- **Incentivise supply of organic municipal solid waste to bioenergy plants.**
- **Avail prediction capabilities for accurate planning.**

Introduction

According to the World Bank (2022), Malaysia's urban population has been steadily increasing since 1960. Today, the population in the country's urbanised areas has increased to 78 per cent of the total. Integral to an increase in urbanisation has been an increase in MSW generation and an increase in electricity demand. Converting MSW into electrical energy would be a two-pronged, symbiotic approach that tackles both matters simultaneously while addressing SDG 11 Sustainable Cities and Communities and SDG 7 Affordable and Clean Energy.

About the study

MSW management has been a challenge in Malaysia as in many developing nations. The current preferred method of disposal is via landfills which throughout the country are mostly open dumping grounds. (Samsudin & Don, 2013). This practice is not sustainable and could pose health and environmental hazards. In Malaysia, solid waste management is governed by the National Solid Waste Management Policy (DPSPN, 2016) issued by the Prime Minister's Office. Six objectives have been laid out, and the second objective briefly touches on converting waste into energy (Strategy 8, Action Plan 28). In addition, the fifth objective calls for centralised data collection (Strategy 15, Action Plans 44, 45 and 46). These policies directly address the need, however, the expected outcomes are yet to be realised. Clearly, the gap lies in the implementation of government policies. Capitalising on strategies employed in other nations as well as studies conducted locally, some methods are proposed herein to realise the policy objectives. In addition, an improvement is also proposed in the spirit of continual improvement.

To ensure success downstream, the effort must be kicked-off correctly. In this case, the first step is collection which when coupled with segregation makes the practice generally more efficient. Kubota, Horita and Tasaki (2020) reported on the use of waste banks in Indonesia. In the study, this practice mainly benefitted

recyclers. However, if more sub-steps of the process are monetised, it would be an added motivation for all stakeholders. Local communities should be empowered in running the schemes to encourage a stronger buy-in. The segregated organic wastes could be used for local bioenergy plants, if these are available in-situ.

In 2019, Zulkifli *et al* implemented a successful pilot project of converting MSW into methane gas using anaerobic digestion (AD), citing this to be the most promising technology to meet this objective. This prototype could be suitably developed and scaled up to cater to local needs.

For localities without in-situ bioenergy power plants, biomass could be pelletised and transported to the nearest plants. This exercise could be spurred on by attractive benefits such as tax exemptions, toll-free delivery and higher rates for long-term sustained commitments. Data collection at every level should not be neglected. In "What a Waste 2.0" (2018), Korea was singled out as having used information management to reduce waste. A similar centralised platform could be set up which acts as a database for logging relevant information, a centre for regulatory information, geo-locations of waste banks and bioenergy power plants. The statistics gathered, read in conjunction with population growth, change in lifestyle and other socio-economic factors, could be used for projecting future availability of biomass for effective planning.

Results and conclusions

The rising trend of urbanisation would require rethinking of essential practices like MSW management. Deliberate micromanagement at grassroots level may be required at the onset until a sense of ownership is developed amongst stakeholders. Eventually, a self-regulating ecosystem could emerge.

Recommendations

Identify strategic MSW collection points

Select key sites for MSW collection based on relative location from main contributors like townships. Simultaneously satisfying human health requirements and minimising environmental impact. The MSW should be modelled after waste banks are established, as described above

Incentivise waste collection and segregation

Monetise every level of waste collection and segregation. Extract organic waste for bioenergy production in-situ or off-site.

Facilitate organic waste supply to bioenergy plants

Boost supply of MSW organic wastes to bioenergy plants employing attractive benefits like tax exemptions, toll-free delivery, and higher rates for long term sustained commitments.

Forecast future supplies to enable continuity

Formulate appropriate algorithms to predict rate of availability of fuel for bioenergy plants for effective planning and management. This forecasting should include consideration for population growth, change in lifestyle and other relevant socio-economic factors.

About the author

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Addressing pollution and climate change within urban transport in Southeast Asia

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Summary

This policy brief presents innovations in urban transport that could decrease pollution levels and contribute to climate change actions. The research focuses on solutions implemented in Malaysia and assesses the potential for replication and adaption in Indonesia, one of the largest greenhouse emitters in the ASEAN (Association of Southeast Asian Nations) region (Government of Indonesia, 2021a). Indonesia aims to reduce greenhouse gas emissions (GHG) by 29 per cent voluntarily, or 41 per cent with international support.[1] There is potential for Indonesia to reduce GHG emissions with measures such as investments in public transport and low-emission transport technologies. This policy paper aims to present key recommendations to achieve these objectives based on the lessons learned in Malaysia.

> ### Key messages
>
> - **Increase public transport provision in the urban area.**
> - **Develop travel on demand method e.g. public transport planning, park-and-ride hubs.**
> - **Increase infrastructure development with links to technology and apps.**
> - **Create an integrated ticketing system.**
> - **Expand infrastructure and develop policy to accelerate the shift to electric vehicles and buses.**
> - **Increase fiscal incentives to boost the usage of low-carbon fuels in the transport sector (for example, phase out subsidies to coal-based fuels).**
> - **Increase international co-operation oriented to ease access to low emission transport technologies.**

Introduction

Climate change has clear implications, with hydrological patterns changing due to GHG emissions (Li *et al*, 2022) and resulting in widespread destruction, financial losses, and a hazard to human life (Chang *et al*, 2020; Li *et al*, 2022) which cost more than $1.75 trillion (Smith and Arndt, 2020). It is estimated that climate change-related disruptions in Asia will cost more than a quarter (26.5 per cent) of the region's Gross Domestic Product (GDP) by 2050 (Higginbotham, 2021) and transport is part of the contributing factors (OCDE, 2022).

The study

This research presents innovations in urban transport to address the problem of pollution and climate change. The primary focus is on transportation planning and operational strategies in Malaysia. Subsequently, the authors present the potential implementation of these solutions in Indonesia, as one of Southeast Asia's most significant contributors to climate change. The first part of this policy brief presents potential improvements in Indonesia's policy framework and the contribution of transport to pollution. The second part focuses on understanding the potential for improvement in Malaysia's transportation and planning operation strategies.

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[1] This is part of the Paris agreement ratified by Indonesian through Law No. 16 Year 2016

In ASEAN, climate change is likely to impact water availability, health and nutrition, disaster risk management, and urban development, particularly in coastal zones, with implications for poverty and inequality. By 2030, Indonesia is expected to endure temperature increases of about 0.8 degrees celsius (BAPPENAS,2018) with frequent rainfall El Niño/La Niña events expected. These disturbances in the weather could contribute to a loss of up to 20 per cent of GDP (BAPPENAS, 2018).

Pollution Key Indicators: Evolution Indonesia 2000-2019
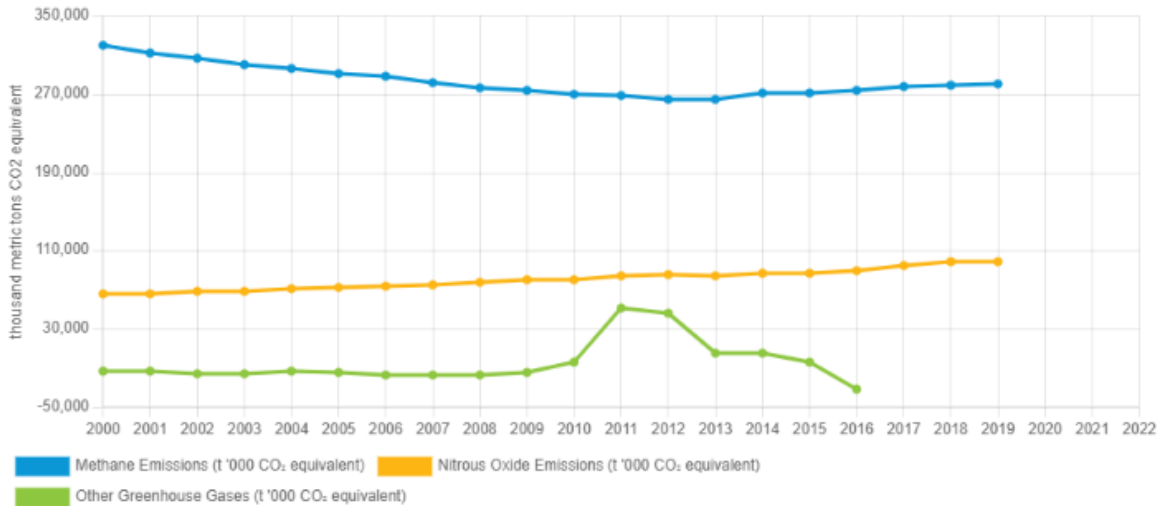
Source: ADB (Asian Development Bank, Key Indicators Database 2022).

The graph above shows current emissions are well above projections. To achieve its targets, Indonesia may need to amend its policy framework to incentivise the transformations required in the energy and transport sectors. The energy sector, which transportation is dependent upon, was the second largest emitting sector in Indonesia, contributing to 34 per cent of total emissions in 2019 and is projected to turn into the largest emitter by 2030, if no decarbonisation efforts are implemented (OECD, 2022, Solaymani,2019). Transportation is regarded as one of the fastest-growing sources of GHG emissions worldwide (Grazi and van den Bergh, 2008).

Kuala Lumpur and its pedestrian 'unfriendly' walkways

The regulatory review process was strengthened to ensure consistency, and these policies have made fossil fuels more financially attractive than less emission-intensive energy. This issue could be redressed by raising fuel taxes (or phasing out the subsidies) and developing support measures for adopting electric vehicles. Fiscal

and non-fiscal incentives should also be considered. This includes the development (and financing) of infrastructure. In the case of electric cars, charging stations, special lanes to avoid traffic, and tax exemptions.

Apart from that, understanding the commuter's needs is crucial because Malaysian citizens, especially those living in the city centre, have been too dependent on private transport due to high dissatisfaction with most transport design provisions (Sham *et al,* 2020). The research also showed that 90 per cent of the current public transport commuters would shift to private transport if they were given a choice to ride in a private vehicle. As reported in a previous study, walking can reduce carbon emissions and improve green mobility (Sham *et al*, 2022). Moreover, delighted passengers indicated a higher perception of safety while travelling and tend to repeat the usage of public transport if given a choice.

In May 2022, data was collected among urban citizens living in the city centre of Kuala Lumpur, Malaysia, using a stated preference survey. They were selected within the active working age who live and work in the city centre and commute to work using public transport.

 Walking activities among pedestrians and users of public transportation have been disturbed by poor accessibility and an unpleasant walking environment (Walton *et al*,2010). There have been complaints from pedestrians of how unfriendly local pedestrian walkways are, expressing dissatisfaction, and suggesting improvements for sidewalks along Klang Valley. If the problem is not solved, their level of satisfaction while riding on public transport would be affected, and this will be reflected in a reduction in the ridership of the public transport that leads to higher carbon releases if private vehicles are used.

Results, conclusions, and recommendations

Below are the study recommendations…

- National energy policies need to be integrated into national climate change policies.
- Engage a good public transport provision and infrastructure in an identified urban area.
- Engage in a proper demand travel by having ample park-and-ride centres.
- Operate an electric bus service in a selected urban area.
- Increase the usage of Integrated ticketing in the public transport payment system.
- Policy measures to encourage the usage of electric motorcycles are required.

These recommendations will result in a sustainable transport practice that reduces the carbon released that indirectly affects climate change.

Enhance the public transport provision, infrastructure, and operation

This can be done through a strategy of push factors towards the usage of public transport over private transport. Among the methods used is to focus on the transport service characteristics and provision in the urban area for people to commute.

Engage with the integrated ticketing

With integrated ticketing, no printing is required, and this creates attraction for public transport usage. In the long run, this will indirectly reduce carbon emissions

Implement a travel on demand approach with park-and-ride hubs

This will create a centre of attraction when the public could be attracted to use the public transport as compared to their private transport.

About the authors

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