WHOLE SCHOOL APPROACH TO LEARN AND EDUCATE PLASTIC POLLUTION IN GALLE CITY, SRI LANKA

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1. Introduction

Plastic pollution represents one of the most pressing environmental issues facing the planet today. This is largely due to the increasing mass production of single-use plastics (SUPs) including packaging materials and other items that are quickly outpacing the world's ability to respond. According to the United Nations Environment Programme (UNEP), the equivalent of one garbage truck of plastic waste is dumped into our ocean every minute [1].

Moreover, out of 9.2 billion tonnes of plastic produced globally between 1950-2017, as much as seven billion tonnes of plastics (76%) have become waste which have ended up in landfills. Alarmingly, only 9 percent of all plastics ever made have been recycled [2]. Poorly disposed plastic waste not only can negatively impact habitat and biodiversity - effectively reducing ecosystem's resilience to climate change - but also directly affect the societal well-being of millions of people who depend on environmental resources for food and livelihoods [3]. Much like other developing countries, Sri Lanka is also experiencing tremendous challenges with managing rapidly growing plastic waste, widely attributed to a lack of capacity for proper municipal waste management, unsustainable production and consumption, changing consumer patterns and ineffective disposal. Recent studies suggest that Sri Lanka generated as high as 938 metric tonnes of plastic waste per day (MT/D) in 2020. Of this total, 300 MT/D was collected by local authorities (LAs), with a large majority of plastic waste (262 MT/D) are openly and illegally dumped. In addition, only 38 MT/D of this plastic had been recovered for recycling. At present, uncollected waste is estimated to account for 638 MT/D, of which about 140 MT/D is self-disposed and 419 MT/D openly and illegally burnt in individual premises, respectively. Other findings indicate that upwards of 70 MT/D is disposed into the surrounding environment while 8 MT/D is leaked directly into surrounding water bodies [4]. To address plastic

pollution in a more holistic and integrated manner, the Ministry of Environment (MOE), Sri Lanka has developed the National Action Plan on Plastic Waste Management for the years 2021-2030 (NAPPWM, 2021-2030). The NAPPWM was developed by way of multi-stakeholder consultations, including between government, business, and civil society actors, and calls for proposed actions on plastic waste management based on circular economy and 3R (Reduce, Reuse and Recycle) principles [5]. Further, the action plan addresses the full lifecycle of plastic waste including the stages of export/import, processing, consumption, collection, recovery, recycling and final disposal. Against this background, it will become increasingly important for Sri Lanka to implement the NAPPWM in line with other international commitments for achieving the goals of the 2030 Agenda for Sustainable Development Goals (SDGs), especially Goal 12 (Responsible Consumption and Production), and Goal 14 (Life Below Water). In so doing, the action plan also serves as a framework for guiding Sri Lanka on the delivery of other regional and global agreements, including the Regional Marine Litter Action Plan for South Asia (2019), a Roadmap for Sustainable Waste Management and Resource Circulation in South Asia (2019-2030), Ha Noi 3R Declaration – Sustainable 3R Goals for Asia and the Pacific (2013-2023), Basel Convention Plastic Waste Amendments (BC-14/12), as well as the recent resolution on plastic waste adopted at the United Nations Environment Assembly (UNEA 5/14) in 2022 [6].

Nevertheless, effective implementation of the NAPPWM will require a social, cultural and economic shift in addition to the promotion of technical and scientific innovations to address and ultimately prevent plastic pollution. Doing so will necessitate a shift in lifestyle choices and consumption patterns, as well as changes individual actions and behaviors to achieve a society that makes use of fewer plastic products. At the global level, the concept of Education for Sustainable Development (ESD) emerged from a need for education systems to better address growing sustainability challenges. Following the experience of the UN Decade on ESD (2005-2014) and the Global Action Programme on ESD (2015-2019), the 206th UNESCO Executive Board adopted a new framework for ESD which is called the Global Action Programme (the GAP) aiming at reorienting and strengthening education and learning to contribute to the transformation of society by way of efforts to achieve sustainable development goals. The GAP identified five Priority Action Areas, including: 1) Advancing policy; 2) Transforming learning and training environments; 3) Building capacities of educators and trainers; 4) Empowering and mobilizing youth; and 5) Accelerating sustainable solutions at the local level to enable strategic focus and foster stakeholder commitment [7]. Historically, Sri Lanka has made a significant improvement to its formal education sector which has contributed enormously to the country's improved literacy rate, gender parity, higher school enrolment rate at both primary and secondary levels and greater school retention rate within the South Asian region [8]. Sri Lanka's latest National Education Policy Framework (2020 to 2030) emphasises the need for further efforts to incorporate SDG 4 on education into national policies, plans, curriculum modernization, and evaluation systems. It also proposes areas for enhancing formal education curricula on science, mathematics, technology, and ICT helping to enhance skills and competencies for aimed at helping students meet the demands of local and international labor markets.

In much the same way, new teaching and learning methods, including skills development approaches such as critical thinking, creativity, problem-solving, emotional intelligence, empathy, respect, understanding of environmental and sustainable development issues have been also introduced with a view towards strengthening active learning and preparing students to address emerging sustainability issues. For example, in order to encourage students to undertake practical actions for conserving and protecting the environment at schools, the National Environmental Pioneer Programme was launched as far back as 1984 by the Central Environmental Authority (CEA) in Sri Lanka's Ministry of Environment with sponsorship from the Ministry of Education, Sri Lanka.

Despite these achievements, practical application of international and national policies, curricula, learning and practices for promoting ESD have yet to become mainstreamed in Sri Lankan schools. As such, this paper seeks to present the experience of the model education project implemented by the IGES Centre Collaborating with UNEP on Environmental Technologies (CCET), the Ministry of Environment, Sri Lanka, the Secretariat of the Basel, Rotterdam and Stockholm Conventions (BRS Secretariat) and HELP-O, a local non-governmental organization (NGO) in Galle City. This model education project is being implemented as part of an umbrella project entitled "Marine litter and microplastics: promoting the environmentally sound management of plastic waste and achieving the prevention and minimization of the generation of plastic waste" (BRS-Norad-1), which is being

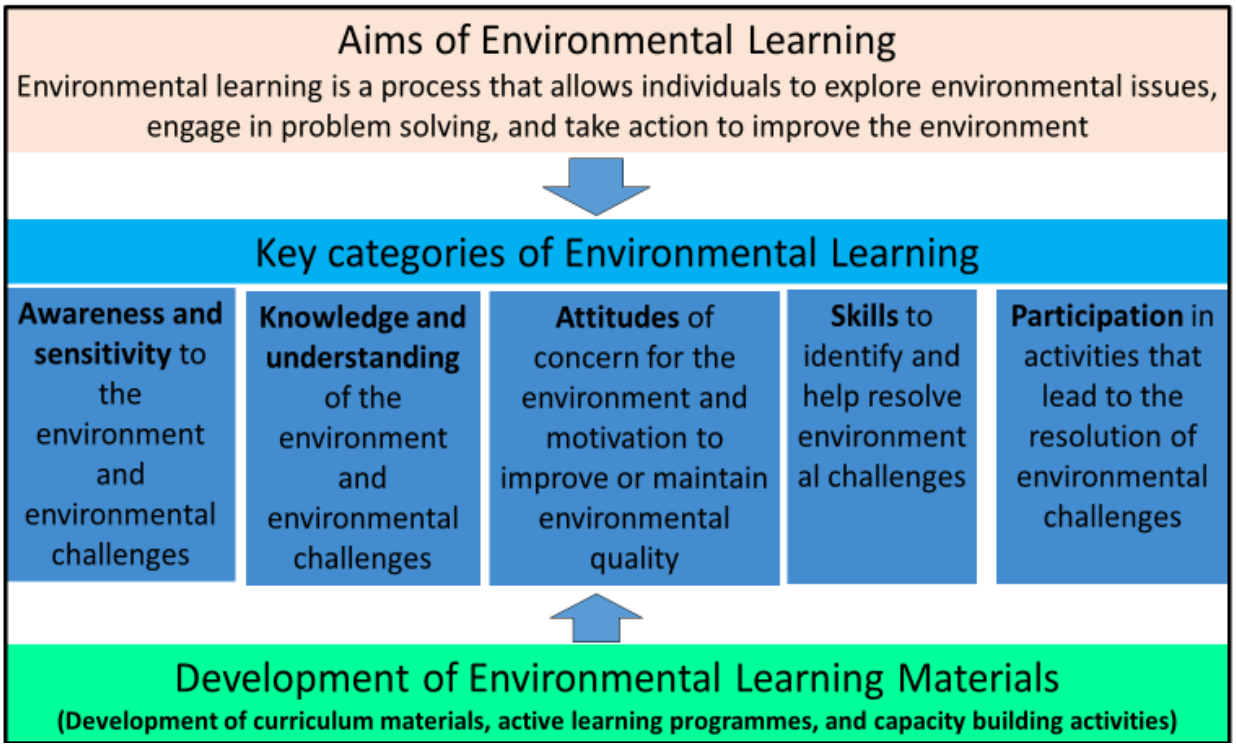

Figure 1: Aims of Environmental Learning [9]

implemented in Sri Lanka and Ghana, and also features global activities. The BRS-Norad-1 project is financed by the Norwegian Agency for Development Cooperation (Norad) with additional funding provided by the Government of the Netherlands. In Sri Lanka, the project is jointly implemented by the Ministry of Environment, Sri Lanka, IGES and the BRS Secretariat. The model education project is closely engaging with three pilot schools in Galle City, working both to expand teaching and learning opportunities around action-based education, as well as providing options for students and teachers to get involved in plastic waste management and related sustainability initiatives. The ultimate goal of the project is to enhance educational curricula and learning methods to support teachers and students with the development of skills, knowledge, and behavior changes for reducing, and ultimately preventing plastic pollution in schools and local communities across Sri Lanka (Fig 1).

This paper consists of four sections. After this introduction, Section 2 briefly introduces concepts associated with the Whole School Approach (WSA), which provides an analytical framework for conducting environmental education and learning towards achieving sustainable plastic waste management in Galle City. Next, Section 3 discusses how WSA has been implemented in 3 pilot schools in Galle City, noting partnerships with key stakeholders, specific measures adopted and the key results achieved. Section 4 concludes by summarising insights and recommendations for establishing an effective environmental learning programme in schools based on lessons learned.

2. Whole School Approach (WSA)

A Whole School Approach (WSA) provides answers to the above questions and a framework for re-orienting and re-designing education in view of emerging and increasingly complex global sustainability challenges. It recognises the active role of entire school community (principle or head master, teaching and non-teaching staff, students, parents and communities) in tackling sustainability issues within educational systems [10]. According to UNESCO, WSA therefore involves addressing the needs of student, teachers, staff and the wider community, not only focusing on curriculum planning but across the whole school and learning environment, pursue collaborative action in schools, and more widely within their communities [11]. Doing so can help to improve student learning, behaviour and overall wellbeing while also fostering the supportive conditions for nurturing these traits over the longer term. Historically, WSA is a concept that emerged late in the 20th century growing out of related but distinct fields such as Education for Health and wellbeing, (Global) Citizenship Education and, Education for Sustainable Development (ESD). In this regard, WSA aims to advance a more holistic and integrated view of sustainability, highlighting how environmental issues intersect with multiple social and political agendas [12].

Figure 2: The Whole School Approach Flower Model with its 6 Key Components [13]

Though we can find different models of WSA embraced in international education policy initiatives and related research, all recognise common elements for anchoring holistic, systemic and integrated approaches in educational settings to influence learning outcomes. WSA also serves as a basis for guiding schools on ways to embed ESD principles into classroom strategies, with particular attention to vision, curriculum, pedagogy and learning, institutional practices and didactics, as well as school management. Lastly, WSA also supports education professionals to reflect on their own learning needs and collaborate with other stakeholders through community connections (Fig 2). In sum, WSA can be used for all levels of education, extending from primary levels through to secondary and university stages.

3. Implementation of Whole School Approach (WSA) in three Model Schools in Galle City

This section summarises key activities and discusses the learning process applied towards mainstreaming WSA in three model schools with a view to educate about plastic issues in Galle City, Sri Lanka. Pilot schools (Table 1) were selected in consultation with the Education Department of Southern Province representing a cross-section of three different types of educational institutions: boys, girls and coeducation schools. Efforts were made to co-design the new environmental learning programme and associated education materials on plastic pollution by conducting a series of participatory workshops across the city in close collaboration with relevant stakeholder groups represented by respective Expert Committees. Key results are presented in more detail below with a view towards encouraging education professionals to reflect on their own learning needs and seek collaborations with wider stakeholders at the regional level. It is important to note that many of the lessons provided below can be tailored to all levels of education, from primary schools to universities and beyond.

Table 1: A summary of model schools in Galle City

Description	Vidyaloka College	Sacred Heart Convent	Dangedara Jayawardhana College
Type of school	Boy's school	Girl's school	Mixed school
Year of establishment	1941	1896	1951
No of students	2,371	2,513	625
No of teachers	125	110	41
No of grades	Grade 1-13	Grade 1-13	Grade 1-13
Language	Sinhala/ English	Sinhala/ English	Sinhala
Administration	National school	Provincial school	Provincial school

(a) Vision, Ethos, Leadership & Coordination

To address the plastic pollution in the schools and society in a collective manner, all model schools must have a strong vision to become Zero Plastic Waste Schools. Pilot schools under the project had banned bringing single-use plastic (SUP) products, such as polythene bags, food and candy wrappers, and PET bottles, onto their premises. This included also setting guidelines for school canteens to reduce SUPs and integrating these into respective school policies and charters (Fig 3).

Figure 3: A School Charter of Vidyaloka College

A strong commitment and leadership of the head teacher (Principle) is a prime determinant for plastic reduction actions including on securing support for coordination and changes in the school administration system. Further, representative teachers and student leaders (i.e. Prefects, Environmental Committees, and Student Parliament Members) organise environmental learning activities with the environmental clubs. Although school actions aimed at managing plastics are enacted in a top-down manner under the leadership of head administrators, they are communicated with parents by way of regular meetings.

(b) Curriculum, Pedagogy and Learning

Sustainability issues such as plastic pollution are complex and as such demand integrated and interdisciplinary solutions. That said, a number of emerging sustainability topics have yet to be introduced into school curricula, including both with regard to disciplinary (regular subjects) and interdisciplinary subjects. Against this background, the project developed a Teacher Resource Book and complementary Student Workbook detailing opportunities to realise a plastic waste-free future. These materials seek to provide teachers and students with a contextualised curriculum that promotes critical thinking and engagement on cross-cutting sustainability challenges (Fig 4).

Figure 4: Teacher Resource Book

In order to integrate local knowledge and broaden participation, a series of consultative meetings were organised with educational experts, teachers and students throughout the drafting process. The knowledge products are currently in the process of being integrated into the national and teaching methods across Sri Lanka. New curricula have also been developed with a view to provide alternative forms of pedagogy and environmental learning on plastic pollution. This includes both classroom and outdoor education-based activities, such as a field studies on plastic waste, brand audits, observation of plastic waste leakages and hotspots in the neighbourhoods as well as participation in beach

cleanups and citizen science initiatives. Students are further encouraged to survey coastal and river environments by conducting digital observations and microplastic analysis. Similarly, in order to further strengthen learning through observation, students have been invited to tour affiliated recycling factories and take note of their operations.

These activities, among other, help in advocating more sustainable lifestyle choices and options for the wider school community to reduce plastic waste. To this end, several intermural art competitions have been organised to raise awareness and promote more responsible behaviors.

(c) Institutional Practices

Based on these experiences, sustainable learning and practices for reducing plastic pollution should be initiated within the classrooms and progressively scaled up both within the school system and across communities. While the model schools are still working to institutionalise new curricula into their regular education programmes, all of them have introduced a number of different strategies, including (but not limited to) source separation of waste, setting up recycling bins to store plastic waste, a plastic-free-cafeteria, plastic-free-classrooms and upcycling (Fig 5).

Figure 5: Discussions of plastic-free-classrooms

Similar to many other schools in Sri Lanka, participating schools also feature environmental clubs which organise regular learning, knowledge and experience-sharing activities. All of these strategies have contributed towards achieving the school's overall goal of zero plastic waste schools.

(d) Community Connections

Schools are part and parcel of the local community and as such have no shortage of valuable insights for guiding teaching and learning. However, many of these resources are not readily available at present. In order to foster a healthy milieu that invites and supports sustainability, it is critical for schools to pursue collaborative relationships with parents, local residents, businesses (waste collection staff, local farmers, repair and recycling shops, hotels, etc.), community and cultural centers (libraries and museums etc.), as well as informal learning places, other government institutions, civil society organisations, special interest and advocacy groups, and local governments.

Figure 6: Beach Cleanup on World Environmental Day 2022

In this context, in order to enhance synergies and promote mutual learning on plastic pollution and understand its negative environmental impacts, model schools organised a series of community projects (i.e. awareness walks, art, and craft exhibitions, reporting their research outcomes through educational videos) as well as different cleanup activities in partnership with a range of stakeholders involved in the project (Fig 6). These activities helped students enrich their understanding on key issues related to environment and society, as well as their individual and civic responsibilities. At the same time, community partners were provided an opportunity to offer their insights while also benefitting from the students' attention, cooperation and creativity through various research projects. Likewise, by making use of the local community as a living lab or an outdoor classroom, students are able to become more deeply rooted in their surroundings and further cultivate a sense of place and connectedness.

(e) Capacity building

Capacity building and the professional development of teachers on emerging sustainable development issues and trends is of critical importance. Doing so involves introducing new teaching methods and knowledge strategies, including the design of active learning curricula, brokering relationships both within the school and with outside partners in the community, and mediating a range of disciplinary perspectives and approaches. While Sri Lanka does not presently offer standardised training programmes that instruct on alternative forms of assessment (particularly those that focus on socio-emotional and embodied forms of learning), teachers have the opportunity to enhance their skills and competencies for sustainable development by way of networking and engaging with their co-workers (Fig 7). Potential brainstorming questions include What do teachers have to learn from one another on sustainability? Which colleagues are interested in identifying solutions? and What knowledge and skills are needed both at the individual level or required as a team?

WSA seeks to enable a transition in educational systems towards more integrated, existential, and relational forms of teaching and learning. Facilitating this shift requires the participation of the all staff— in addition to teachers, relevant personnel also include those managing the school canteen, maintenance workers responsible for looking after the buildings and school grounds, school nurses and others, all of whom must have the skills to support such learning and contribute to the ethos the school aspires to realise. Depending on the type of work and responsibilities of respective staff members, there will be differences in what these competencies entail. For example, learning to think and act sustainably does not only require a broad knowledge of sustainability issues. It also involves proficiencies such as network building, systems thinking and developing new didactical skills.

Figure 7: Networking and peer-learning events

4. Lessons Learned

Below are a few insights gained from implementing WSA in the pilot program:

Inclusive planning and decision-making:

Both inclusive planning and engagement with students, teachers, parents and community members—recognising them as valued voices-- is vital for effective planning and implementation of WSA, particularly in relation to emerging sustainable development challenges such as plastic pollution. School administration should work towards strengthening their institutional capabilities including by building relationships with businesses, community organizations and parents, who, in turn, may opt to volunteer and support relevant school programmes. Moreover, additional efforts are needed to introduce curriculum reforms and school policy changes for carrying out WSA. This can include making use of existing processes such as or school development committees, hosting as regular consultations, or holding periodic focus group discussions. It is further evident that in order for these reforms to be fully realised, schools require inspirational leadership, as well as financial and organisational support from the head-teacher (principal), school administration and faculty.

Transforming teaching tools and curricula:

WSA involves guiding a transformation from teaching-centered to learning-centered education. One important entry point for modifying classroom teaching strategies and thinking approaches for student engagement involves linking existing curricula with local issues, which in turn can lead to action projects integrating a different form of learning (inquiry-based, action-oriented, investigative, etc.). This helps in extending learning and practices, developing hands-on skills, providing life/work experiences, and more. In addition, development and application of alternative forms of monitoring and reporting, research and evaluation, such as action-oriented research projects that bridge school commitments and regional and national curriculum requirements, remain essential in many cases. Similarly, national curricula can also be designed with consideration of local issues/resource requirements for implementing effective learning activities while also providing space for innovation in pedagogy and learning methods.

Leadership, Commitment and Capacity building:

Also, transitioning to WSA necessitates introducing new knowledge, learning and practice techniques which can be hard and time-consuming exercise for teachers and school staff. Supporting personnel in this endeavour represents one critical factor for staff empowerment and motivation. Moreover, the unpredictability of a project-based environment may be unsettling and physically draining for educators unaccustomed to such teaching methods. Providing tailored assistance ranging from mentoring sessions, extra planning time, and opportunities for professional development is therefore also essential. Working in partnership with other similar schools promoting peer-to-peer inter-school learning between students, teachers and school leaders represents another key factor for successfully implementing WSA. Lastly, an institutional framework that enables longer-term partnerships between a range of different-stakeholder groups at the local and regional levels can both guide WSA as well as deepen and broaden its impact.

Creating an enabling policy-environment and pursuing inter-ministerial partnerships:

Creating an enabling policy environment, including through the promotion of inter-ministerial partnerships are critical for mainstreaming WSA and replicating lessons learned from pilot activities at national and regional levels. In this context, both the Ministry of Education and the Ministry of Environment should seek to collaborate with other education and non-educational institutions to foster a supportive policy-environment for sustainable schools, curriculum reforms while also encouraging multiple forms of learning and teaching.

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