In Search of Indigenous Framework on Climate Change Education in the Vanuatu Education System.

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Abstract: Climate change has become the focus of attention in many countries of the world. Education is seen as a pivotal tool not only in bringing climate change issues to the fore of regional and international debates, but also in raising awareness about climate change in schools. In Vanuatu, Climate Change Education (CCE) has been included in the Vanuatu Education System including relevant policies and curriculum documents. This paper reports on the preliminary findings emanated from a qualitative case study recently carried out in Vanuatu. The purpose of the study was to find out if current official curriculum documents promote climate change concepts congruent to local settings, for example, the indigenous knowledge system, to promote sustainable development. Data was collected via interviews of key education and climate change officers; as well as by reviewing relevant educational documents, including educational policies and curriculum. Data collected was analysed through the content analytical tool. The preliminary findings show that the promotion of local climate knowledge in the curriculum is less emphasized. These findings will be articulated in the presentation. The paper then speculates on the best possible indigenous knowledge framework on climate change beyond the curriculum to promote climate change education and to ensure sustainable development for the Pacific people.

Keywords: Climate Change Education (CCE); Vanuatu National curriculum; Indigenous knowledge; Sustainable development

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Annette THEOPHILE is a senior lecturer at the School of Education, National University of Vanuatu. She is originally from Vanuatu and has been working in the field of education for over 20 years. Her background is in environmental science and science education and she has a strong interest in climate change education. She is passionate about helping students and teachers understand environmental issues and how they affect our communities. Annette trains future teachers who will go on to teach environmental science in both junior and senior secondary schools in Vanuatu. She believes in making education relevant to local contexts and helping young people become more aware of their environment.

1. INTRODUCTION

1.1 Background to the Study

Vanuatu, an archipelago of 83 islands, is rich in cultural diversity and indigenous knowledge. The Indigenous Knowledge (IK) remains highly valued and actively practiced by the people [Republic of Vanuatu] [Mercer et. al. 2010]. Vanuatu is also among the most vulnerable countries in the Pacific region exposed to impacts of climate change, including rising sea levels, extreme weather, and ecosystem degradation [Intergovernmental Panel on Climate Change].

Given the context, it is important that climate change responses, particularly through the formal education reflects and builds upon the experiences and Indigenous Knowledge Systems (IKS) of the local communities.

1.2 Statement of the Problem

The Vanuatu curriculum has integrated climate change content and Disaster Risk Reduction (DRR) into its science, geography and social science subjects and offers these to Kindergarten (K) to Year 13. Although IK is acknowledged for its role in sustainable environmental management and disaster preparedness [Nakashima et. al.] this knowledge is often left out of school curricula, which are mostly based on western scientific views [McCarter et. al. 2014]

1.3 Purpose of research

This research study investigates the extent to which IK, especially traditional early warning systems (TEWS), is represented in Vanuatu's Climate Change Education (CCE) framework. It also explores how an IK framework can be more effectively integrated into policy and classroom practices to support climate resilience and sustainable development. The research is guided by the following questions:

1. *How well is IK, particularly TEWS, integrated in the Vanuatu's CCE framework?*
2. *To what extent do curriculum and policy documents reflect local ecological and cultural contexts?*
3. *How can an IK framework contribute to climate resilience and sustainable development?*

2. LITERATURE REVIEW

IKS are understood as a body of knowledge, practices, and beliefs developed by Indigenous communities through long-term interaction with their environment. This knowledge is passed down orally through stories, rituals, and hands-on experiences, and is often holistic and deeply connected to nature [Sillitoe]. Researchers explain that, in the context of climate change, IKS includes early warning signs like cloud patterns, animal behaviour, and seasonal changes that help communities prepare for environmental hazards [Dei]. Similarly, traditional knowledge (TK) is defined as local knowledge held by Indigenous and local people, based on experience, adapted over time, and passed on through generations [McCarter et. al. 2011] A recent Pacific study [Berkes] highlights how IK and TK support community resilience in the face of climate-related challenges, particularly in island nations. In Vanuatu, research show that both IK and TK play key roles in local adaptation strategies, and the two terms are often used interchangeably [Koya et. al]. In this search, I will also use the terms IK and TK interchangeably, as both refer to local systems of understanding and responding to environmental changes.

The integration of IKS into formal education offers several benefits. It increases cultural relevance and student engagement [Koya et. al.] strengthens community-based resilience to climate risks [McCarter et. al.] and contributes to decolonizing education by acknowledging Indigenous epistemologies as valid and valuable [Warrick et. al.]. Furthermore, the IKS supports sustainability by promoting traditional practices of land stewardship and intergenerationa7 knowledge transfer [Nakashima et. al.].

However, the incorporation of IK into education systems faces several challenges. Formal curricula often marginalize IKS in Favor of Western scientific approaches [Mercer et. al.] and the oral nature of IK complicates its documentation and assessment in classroom settings [Battiste] Epistemological tensions between holistic Indigenous worldviews and the compartmentalized structure of formal education further limit effective integration [Nunn 2023]. Additionally, while policy frameworks may acknowledge the value of IKS, educators are often not provided with adequate training or resources to implement it effectively [da Silva et. al.].

This research is framed within the IK Systems (**IKS**) theory, which recognizes the value of community-based, place-specific knowledge passed down through lived experience, environmental observation, oral traditions, and spiritual beliefs [Nakashima et. al.] [Matapo]. The theory challenges the dominance of western epistemologies and calls for a pluralistic curriculum that validates indigenous perspectives alongside scientific knowledge.

Using IKS theory as a foundation, this research critically examines the curriculum and policy documents in Vanuatu to assess whether and how IK is acknowledged, and how it is being applied in the classroom. The study also explores the perspectives of curriculum developers, educators, and climate professionals to understand

the opportunities and constraints in embedding IK into formal education.

To situate this research within the broader academic context, previous studies [Granderson] have explored similar questions using thematic approaches. One study investigated the role of TK in climate change adaptation by examining community-based resilience, the integration of IKS, and policy relevance [Ministry of Education and Training]. Another one explored local risk perception, TEWS, and education strategies for climate preparedness [Rarai et. al.]. Building on these works, the present study adopts a thematic framework that reflects both global insights and the specific realities of Vanuatu. Accordingly, findings will be analysed under three key themes: 1) Recognition of IK in national policies; 2) Incorporation of IK in curriculum development and implementation phases;3) Opportunities for enhancing cultural resilience through education.

3. METHODOLOGY

This study employed a qualitative, exploratory approach grounded in a constructivist–interpretivist paradigm. This paradigm supports relational and contextual understanding, aligning well with Indigenous epistemologies and knowledge-sharing practices [Nunn et. al.].

Participants were selected using purposive sampling to ensure expertise in classroom teaching, curriculum development, climate change adaptation, and IKS.
The study involved the following individuals:

1. Four (4) curriculum coordinators – one (1) for primary and three (3) for junior and senior secondary levels.
2. Four (4) teachers – one from semi urban senior school, 1 from rural junior secondary school and 2 from urban senior secondary school.
3. One (1) officer from the Education in Emergency (EiE) program under the Vanuatu Ministry of Education and Training (MoET)
4. One (1) senior officer from the Van-KIRAP project under the Vanuatu Ministry of Climate Change

Two primary methods were used to collect data from the participants:

Document Analysis:
Key national policy and curriculum documents were reviewed, including the Vanuatu National Sustainable Development Plan (VNSDP 2030), the Vanuatu Climate Change and Disaster Risk Reduction (CCDRR) Policy 2016–2030, VAN-KIRAP Traditional Knowledge Strategy (2019–2024) Disaster Risk Reduction and Education in Emergency (DRR&EIE) policies, the Vanuatu National Curriculum Statement (VNCS) and subject syllabi for earth science, geography and junior Science. These documents were examined using Bowen's qualitative content analysis method [Jones et. al.] to assess the presence or absence of IKS content, with a particular focus on TEWS.

Semi-Structured Interviews:
The interviews explored participants' perceptions, experiences, and practices concerning the integration of IKS—particularly TEWS—into formal education. Interviews were audio-recorded with consent, transcribed verbatim, and analysed using an inductive approach to allow key ideas to emerge naturally [Bowen] followed by a deductive phase where responses were organised according to the study's main themes. Recurring ideas were identified and grouped using a thematic analysis process [Braun et. al.].

4. RESULTS AND DISCUSSION

Document analysis shows that while national policies strongly recognize the importance of IK, this recognition is not yet fully reflected in the formal school curriculum. The VNSDP 2016–2030 document states that IK is vital for sustainable development, cultural identity and environmental resilience, hence calls for its preservation and integration across education and national planning.

Similarly, the Vanuatu Climate Change and Disaster Risk Reduction Policy (2016–2030) goes a step further by actively promoting the use of TK especially TEWS alongside scientific methods in community-based climate adaptation and disaster preparedness initiatives. At the education sector, IK is supported by the VNCS through its integration into curricula and articulation of its value under the theme "culture and values".

Complementing these formal efforts by the education sector, stakeholder-driven frameworks such as the VAN-KIRAP Traditional Knowledge Strategy (2019–2024) adopt a more proactive approach by promoting the use of traditional climate indicators and TEWS in informal education, community awareness programs, and local climate services [Nowell et. al.]. Under this strategy, such tools as the Vanuatu National TK indicators Booklet and Climate Watch have been created to record validate share that community traditional forecasting signs. These efforts emphasize the role of TK in enhancing resilience at the grassroots level, particularly outside the formal school setting. Although the DRR and EIE framework encourages a more community-based and participatory approach to working with schools and community leaders to integrate TK into school readiness plans [VAN-KIRAP], official curricula remain vague on concrete steps to integrate TEWS into classroom learning, particularly in science-related subjects.

This mismatch between active initiatives and curriculum content highlights a persistent gap between recognition of IK at policy level and IK implementation at classroom level, despite promising efforts at the school-community interface through DRR programs.

At the level of curriculum development, coordinators confirmed that climate change and DRR issues appear in the senior school syllabi—mainly in earth science, geography, agriculture, and junior science topics, they are presented from a scientific perspective, with little or no reference to IK, especially TEWS. One coordinator noted that at the time of syllabi development, climate change and DRR were not pressing issues; hence there was little research to support the inclusion of IK. This explains why policy documents have recognized it forcefully but place very weak emphasis on TEWS-related IK in curriculum content. However, coordinators also mentioned that although TEWS is not explicitly stated in the syllabi it happens that teachers are verbally encouraged during curriculum workshops to bring TK into classroom activities where possible.

This shows a clear contrast between what happens at the national level and what is actually happening in the curriculum. While national policies support the integration of TK and scientific knowledge, there are no clear directives for curriculum developers, nor are there supporting resources or assessment tools. As a result, the current curriculum provides little guidance for teachers on how to incorporate IK-particularly TEWS or cultural practices into their subjects.

At the school level, teachers said that one reason IK, especially TEWS is not used in their teaching is because it is not included in the syllabus. As one teacher said, *"We don't teach it because it's not mentioned in the syllabus."* They also explained that their busy timetable makes it hard to add extra content, and that TEWS is usually only taught or make known during special events like "Cultural Week."

Teachers also mentioned that they lack enough knowledge about traditional practices and that their initial training did not prepare them to integrate TEWS into their related science lessons. As one explained, *"We don't know enough about traditional knowledge, and during our training we weren't taught how to include it in lessons."* These comments show that even though national policies support the use of IK, it is still missing from classroom teaching because of limited curriculum content, lack of resources, and insufficient teacher training.
The teachers expressed that they do not have adequate information regarding traditional practices and that their pre-service training did not equip them with the skills to integrate IK into their related science subjects. As one teacher said "we don't know enough about traditional knowledge, and during our training we weren't taught how to include it in lessons.

Despite these challenges, some positive opportunities were noted for better integrating TEWS into climate change and DRR content. Resources such as the school-Based Disaster Risk Reduction (SBDRR) handbook encourage learners to discuss local coping methods from the elders. Such activities also promote a more hands-on, experiential approach to learning.

The Van-KIRAP Traditional Knowledge Indicators Booklet is another useful tool. It records local weather signs and provides practical examples that can help teachers bring TEWS into climate and disaster lessons, especially in subjects like Earth Science and Geography.

5. CONCLUSION AND RECOMMENDATIONS

In conclusion, this study highlighted the gap between national policy support for IK, particularly TEWS and its practical integration into the formal education system in Vanuatu. While policies such as Vanuatu National Sustainable Development Plan (VNSDP 2016–2030), the Vanuatu Climate Change and Disaster Risk Reduction Policy (2016–2030), and the DRR & EiE Framework emphasize the importance of IK and TEWS in building community resilience to climate change and disasters, this vision is not adequately reflected in the implementation phases, that is, in the national curriculum and classroom practices. Though the VNCS encourages the inclusion of traditional knowledge in broad terms, Earth Science and Geography syllabi do not explicitly mention TEWS in their learning outcomes or how IK should be integrated. Such ambiguity leaves teachers with little direction on how to translate the policy intention into classroom practice.

Findings from the study also reveal that IK and TEWS are rarely included in the regular teaching in a classroom, except during School Cultural Week or Meteorology Department outreach days. Despite these challenges, there is significant potential for improvement. The study therefore recommends the following:

1. Incorporate IK and TEWS into teacher training programs with a focus on practical strategies for integration into science and geography lessons
2. Develop culturally relevant teaching and learning resources, drawing from resources like the Van-KIRAP Vanuatu National TK early indicators [VAN-KIRAP] and the school-Based DRR Handbook [Vanuatu Meteorology & Geo-Hazards Department]
3. Foster stronger partnerships between schools and local communities, involving TK holders in curriculum planning and delivery.
4. Revise the national curriculum to include IKS, especially TEWS, and provide clear guidelines for their implementation across subjects.

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