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Course Paper

Lessons from Bakawan: Picture Books as a Tool to Combat Climate Change

The impacts of climate change are already undeniable and unrelenting for today's adults, let alone the generations set to follow them and incur a greater degree of climate danger along the way. According to a summative report released by the Intergovernmental Panel on Climate Change, "Global mean sea level has risen faster since 1900 than over any preceding century in at least the last 3000 years." By the year 2100, climate experts expect sea level to have risen 0.5 to 1.0 meters, with increases of up to 2 meters possible if the stability of ice sheets in Antarctica declines to predicted levels. "It is virtually certain," states the IPCC, "that the global upper ocean (0–700 m) has warmed since the 1970s and extremely likely that human influence is the main driver." Ocean levels are not a one-off issue, either. The acidification and rising temperature of waterways factor into the myriad ways climate change is shifting the natural world. Rising global temperatures, increasing vulnerability to drought, and growing frequency of natural disasters are just a few more consequences of wasteful human consumption over centuries. These facts make it irresponsible to ignore: our planet is at risk of ecosystemic collapse. Despite the vastness of these issues, the IPCC report does offer a possible (though narrowing) pathway out: preventing the average global temperature rise from reaching 1.5 degrees Celsius. If there is hope-be it

¹ Intergovernmental Panel on Climate Change. 2021. "Climate Change 2021: The Physical Science Basis, Summary for Policy Makers." https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM_final.pdf.

though small—how are we to capitalize on it? Chief among climate concerns is the future of today's children who, according to the Washington Post, will face three times the number of climate disasters as their grandparents did.² As children develop in an age of environmental anxiety, how are they to interpret this overwhelming reality? The following research will focus on children's literature as a tool for educating youth about climate change and equipping them with tools for action. In this context, "storybooks," "children's books," and "picture books" all denote short books with an emphasis on illustrations and simple language, which are targeted to children around ages 2-10. This paper will utilize two Filipino children's books with environmental themes to uncover how authors might best cultivate an eco-minded generation with the willpower and knowledge to combat humanity's most pressing crisis. Given the "extremely high risk" of climate disaster that children in the Philippines face³, environmental storybooks from this region arise as a vital—though often overlooked—pathway for delivering climate truths. This research considers the capabilities of children's literature, as well as how its industry (from local to conglomerate publishers) and content or themes contribute to childhood attitudes toward climate change. Then, using Bakawan (Yu Untalan et al., 2009) as a guide, the following investigation will address the unique benefits and drawbacks of Filipino children's literature, as well as recommendations on how to apply these lessons to other youth populations toward the goal of a safer climate future.

In 2021, UNICEF published its first "Children's Climate Risk Index," defined as a "comprehensive analysis of climate risk from a child's perspective."³ In this stratification, which

² Kaplan, Sarah. 2021. "Climate change to bring today's kids 3 times the disasters, Science study finds." *The Washington Post*, September 26, 2021.

https://www.washingtonpost.com/climate-environment/2021/09/26/change-disasters-kids-science -study/.

³ *The Climate Crisis Is a Child's Rights Crisis: Introducing the Child's Climate Risk Index.* Report. United Nations Children's Fund (UNICEF). Summary ed. 2021.

evaluates risk based on "environmental shocks" like cyclones, heatwaves, and floods, the Philippines ranks number one. In a foreword from organization Fridays for Future, the report asserts, "Children bear the greatest burden of climate change. Not only are they more vulnerable than adults to the extreme weather, toxic hazards and diseases it causes, but the planet is becoming a more dangerous place to live." Though the report is comprehensive in nature and addresses a variety of climate effects, some data stand out as particularly relevant to the Filipino population. According to UNICEF's data, "1 in 10 children globally" are currently "highly exposed to coastal flooding" with sea level rise. "Nearly 1 in 6 children globally" are "highly exposed to cyclones," which are predicted to increase not only in frequency but in intensity, too. With shifting patterns, cyclones are likely to rise to levels 4 and 5, which constitute "major" hurricane designations on the Saffir-Simpson Hurricane Wind Scale. These values indicate "catastrophic damage" caused by winds of at least 130 mph and joined by power outages lasting "weeks to months."⁴ In a map depicting "Overlapping Climate and Environmental Hazards, Shocks and Stresses," the Philippines archipelago is shaded red and orange for the number of hazards; "Extremely High (greater than or equal to 5)" and "High (4)", respectively. The report also includes the perspective of Mitzi, a young girl from the Philippines. Mitzi notes the difficulties of organizing for climate action amid the COVID-19 pandemic, explaining, "The Philippines' lockdown has made campaigning and organizing challenging. That's the thing about activism—it's not just about the powerful massive strikes... It's not just about going out on the streets and yelling out chants." While Mitzi represents an older youth population than that which is primarily targeted by children's books, her sentiment helps shed light on the reality that climate activism is not only mass mobilizations and media events. Rather, it can take place in

⁴ "Saffir-Simpson Hurricane Wind Scale." n.d. National Hurricane Center. Accessed December 2, 2021. https://www.nhc.noaa.gov/aboutsshws.php.

any setting, at any time. This makes storybooks prime material for informing children about environmental stewardship early on, without the requirement that they travel even to school. Co-signers including activist Greta Thunberg remind readers: "We must... find solutions to build resilience and help those already in trouble. The crisis is happening now."

Indicating youth interest in these causes, one study conducted among 18 preschoolers in Pennsylvania revealed the receptiveness of young children toward environmental concepts. The study, completed by Witt and Kimple in 2007, sought to teach children about "metamorphosis, plant growth, recycling, and littering" through "a series of lessons and activities"⁵. Witt and Kimple found that environmental science is one of the most ideal subjects to teach children. because "it is practical and multifaceted. This helps hold the young child's attention." Some preschool children are what the study leaders define as "perception-bound learners," meaning they cannot fully process abstract ideas. Rather, they rely on "outside, obvious characteristics" such as color, shape, and other obvious cues to inform their understanding of the world around them. More recent research, however, suggests that this age group is actually capable of "domain-specific" learning, wherein they recognize non-verbal communication to facilitate understanding. For these reasons, stories are one of two "developmentally appropriate method[s]" for getting a message across to preschool children (the other being hands-on learning)³. After the study concluded, more participants correctly answered questions on the process of metamorphosis, steps in plant growth cycles, and methods for recycling than did at the beginning. This shows a growth in foundational, environmental knowledge through use of child-friendly methods which, as Witt and Kimper make clear, is likely to "stay with them as they move into older childhood, adolescence, and adulthood."

⁵ Susan D. Witt and Katherine P. Kimple, "'How Does Your Garden Grow?' Teaching Preschool Children about the Environment," *Early Child Development and Care* 178, no. 1 (December 14, 2008): |PAGE|, accessed December 1, 2021, doi:10.1080/03004430600601156)

Knowledge of environmental processes and problems is an ideal prerequisite for eco-friendly behavior, but actionable change is necessary. As such, directly observable changes in behavior are ideal. In a study that investigated picture books as a method of teaching environmental concepts to Taiwanese preschoolers, "children's environmental concepts had increased greatly" after eight weeks of storybook curriculum⁶. Initially, teachers noticed wasteful behaviors in their students, like using only small portions of paper before throwing them away, or leaving faucets running while washing their hands between activities. To combat these behaviors, the study implemented eight different story books that promoted eco-friendly habits and attitudes. In response to one theme on "Rubbish Problem and Recycling," preschool students understood how to properly dispose of garbage. Additionally, they grasped the concept of energy conservation, demonstrating knowledge of how they should "use less water, electricity, and paper." Participant parents were asked to observe their child's behaviors over the course of the study, answering a questionnaire about them at the outset and ending of the timeline. The results from the study are reproduced in Table 1.

Table 1	. The	results	of p	oarents '	questio	nnaires.
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Questions	Pre-test (%)	Post-test (%)
1. Does your child turn off home appliances when they are not using them?	22	78
2. Does your child open the fridge less often to save electricity?	12	77

⁶ Hsiao, Ching-Yuan, and Pei-Yu Shih. "Exploring the Effectiveness of Picture Books for Teaching Young Children the Concepts of Environmental Protection." *International Research in Geographical and Environmental Education* 25, no. 1 (2015): 36-49. Accessed November 25, 2021. doi:10.1080/10382046.2015.1106203.

3.	Does your child often watch TV?	98	51
4.	Does your child mention any ways of saving water?	7	76
	(For example, rainwater could be kept for watering flowers or flushing the toilet.)		
5.	Does your child use recycled materials to make drawings or do other arts and crafts?	11	89
6.	Does your child take a cotton handkerchief to school?	3	66
7.	Does your child do recycling?	18	92
8.	Does your child take his/her own bag when going shopping?	13	69

Percentage of "Yes" responses to questions regarding preschooler eco-friendly habits before and after storybook curriculum. (*Source*: Hsiao, Ching-Yuan, and Pei-Yu Shih.³)

The influence of environmentally-themed children's books proved quantitatively beneficial. For instance, there was a 78% increase in the number of respondents who answered "Yes" to the question of whether their child uses recycled materials for arts and crafts. In a similar manner, the percentage of children who demonstrated awareness of water conservation methods increased by a vast 71%. The study demonstrated the ability of picture books to curb detrimental behaviors as well as to encourage eco-friendly ones. When asked whether their child watches television often, parent responses indicated a 47% decrease in this energy-intensive activity.

It would be an over-assertion to claim that all children's environmental literature is sufficient enough to promote on-the-ground environmental activism. It is also unlikely that young readers will retain the same exact levels of interest in the environment in the years after

exposure to these narratives. Monhardt and Monhardt⁷ found that 6th grade students (most aged 11-12) relied "more on their feelings than their knowledge of science procedures in assessing the issue of endangered species." In that study, sixth graders read *There's an Owl in the Shower* by Jean Craighead George. Before reading the book, students responded to a survey on whether they valued people's rights or animal's rights over the other. Initially, 41% of students favored people's rights, while 44% favored animal rights; 15% were undecided. Immediately after reading the book, these survey values shifted to 19%, 69%, and 12%, respectively. This increase in empathy toward animals can be interpreted as an environmentalist mentality.

When respondents were tested four months later about a similar environmental scenario that was unrelated to *There's an Owl in the Shower*, however, their responses were nearer to the original survey values. According to Monhardt and Monhardt, "Students of all ages need to develop attitudes of care and responsibility for living things and the environment, but as students reach the upper elementary and middle school level," storybooks alone often fall short of the goal of maintaining eco-friendly opinion over time. They continue, "Environmental topics are common ones in the elementary school, but there is a danger that rather than developing critical thinking skills in students, we turn them into advocates for a particular point-of-view based not on the principles of science but solely on emotions." In essence, Monhardt and Monhardt argue for a more robust curriculum, grounded more in scientific evidence than personal opinion, when books are used as a teaching resource in the classroom. While this is a valid concern, there are a few aspects of the study that limit its direct applicability to this particular investigation of Filipino environmental story books. For one, 6th grade is slightly older than the target audience

⁷ Monhardt, Rebecca, and Leigh Monhardt. 2000. "Children's literature and environmental issues: Heart over mind?" *Reading Horizons: A Journal of Literacy and Language Arts* 40, no. 3 (February): 1-11.

https://scholarworks.wmich.edu/cgi/viewcontent.cgi?article=1218&context=reading_horizons.

for most picture books. By the ages of 11 and 12, most students will have developed critical thinking skills enough to branch out from the perception-bound and domain-specific learning styles fit for toddlers. Lower-elementary students would also benefit less from precise data, as they have not yet gained the skills to interpret it. Additionally, the research compiled herein does not focus solely on classroom-led books; rather, it recognizes the value and accessibility of at-home reading. Other findings in this research paper support the idea that emotional learning is, in fact, a valuable skill for fostering environmental literacy in young children.

In the 2015 "How to Save the World and Other Lessons from Children's Environmental Literature," Echterling raises the complaint that children's literature over-simplifies environmental issues, presenting them as solvable on a personal, rather than organizational, level. "[M]ost contemporary children's environmental picture books and easy readers published in the United States focus overwhelmingly on individual environmentalist acts and lifestyle changes, overlook the connections between environmental degradation and systemic social problems such as class disparities, and ultimately over-simplify environmental justice. The article advocates for more children's books that incorporate themes of environmental justice. The U.S.-based Environmental Protection Agency defines environmental justice as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies."⁹ In the political climate of the contemporary United States, as Echterling clarifies, "children's texts that resign environmental action almost completely to

⁸ Echterling, Clare. 2016. "How to Save the World and Other Lessons from Children's Environmental Literature." *Children's Literature in Education* 47, no. December 2016 (August): 283-299. https://doi.org/10.1007/s10583-016-9290-6.

⁹ Environmental Protection Agency. 2021. "Learn About Environmental Justice | US EPA." Environmental Protection Agency.

https://www.epa.gov/environmentaljustice/learn-about-environmental-justice.

individual choices and behaviors" like recycling "and disassociate environmental crises from their larger constitutive contexts do little to prepare young people for the socio-environmental challenges we face now and in the future." Books that introduce readers to the complex systems that govern environmental policy are ideal, Echterling explains. Those that depict children as "political subjects" with the "right and ability to act meaningfully in the public sphere" and with "the intellectual capabilities" to digest "the connections between environmental degradation and systemic social problems are more actionable.⁴

The idea that children's books be more intersectional is not by any means a narrowly-held belief. Philip Nel of Kansas State University, who advocates for "Radical Children's Literature Now!", addresses the value of non-stereotypical themes in children's stories.¹⁰ Nel defines radical children's literature as that which busts the myth of the "white, middle-class, all-American norm." Themes range from social justice to environmental stewardship, often existing at the intersection of both. Nel also includes the qualification that radical children's literature "suggests that it is impossible and unethical to shut children off from the world outside U.S. borders." Further research into how children's literature addresses the growing crisis of environmental refugees, which space constraints prevent from including in this paper, would be extremely valuable.¹¹ These considerations—intersectionality, radical themes, and lasting impressions—will be taken into account in the following exploration of *Bakawan* (Yu Untalan et al., 2009). To begin that analysis, a brief synopsis of attitudes toward climate change in the Philippines is necessary before expanding into the implications of these opinions.

 ¹⁰ Nel, Philip. 2011. "Radical Children's Literature Now!" *Children's Literature Association Quarterly* 36, no. 4 (January): 445-473. DOI:10.1353/chq.2011.0040.
¹¹ "Climate change and disaster displacement." n.d. UNHCR. Accessed December 2, 2021.

https://www.unhcr.org/en-us/climate-change-and-disasters.html.

Though the Philippines face some of the greatest and most immediate climate threats in the world, public concern about climate change is relatively low, due primarily to rudimentary understanding of global warming without a more complete understanding of the climate problem. In 2015, Prudente et al. carried out a descriptive correlational study that investigated attitudes about climate change in 3 different populations: "300 grade school children, 300 high school students, and 157 adult community members."¹² Participants hailed from 3 major community types in the Philippines: rural, urban, and coastal communities. The study relied on a 21-item climate change Concept Test to measure "conceptions" of climate change. Here, "conception" refers to the level of understanding. If a participant exhibits a firm grasp of a concept related to the climate, such as greenhouse gas emissions, they would be considered to have a high "concept" of greenhouse gases. On the other hand, if they displayed only a basic understanding of greenhouse effect science, or none at all, a lower conception value would reflect that. The results of these findings are tabulated in Figure 1. Interestingly, Rural and Urban Elementary Pupils showed a greater concept of the Greenhouse Effect than adults in the same community types. This may indicate differences in curriculums over time, but that correlation should be further investigated in a future study.

To measure perceived attitudes toward climate change, a 24-item Climate Change Attitude Inventory was used. The results of the study found that regional differences contributed to respondents' professed level of concern about particular climate change impacts.

¹² Maricar S. Prudente, Socorro E. Aguja, and C. Anito Jovito, "Exploring Climate Change Conceptions and Attitudes: Drawing Implications for a Framework on Environmental Literacy," *Advanced Science Letters* 21, no. 7 (2015): |2413|, accessed November 15, 2021, doi:10.1166/asl.2015.6294)

Figure 1. Filipino Conception of Climate Change by Community Type and Age Group

types of communities.					
	Community				
Community Type	Elementary Pupils (n=330)	y HighSchool Students (n=308)	Adult Community Members (n=121)		
Greenhouse	<i>Effect</i> (num	ber of Items $= 9$)		
Rural	2.35 (1.50)) 2.70 (1.55)	2.23 (1.53)		
Urban	3.08 (1.26)) 2.19 (1.39)	2.52 (1.32)		
Coastal	2.06 (1.23)	4.32 (1.65)	3.15 (1.20)		
Global Warmi	i ng (number	of Items $= 6$)			
Rural	1.38	2.48 (1.59)	1.70 (1.26)		
Urban	1.96	2.50 (1.27)	1.53 (1.30)		
Coastal	2.15	2.81 (0.92)	1.78 (1.21)		
<i>Climate Change</i> (number of Items = 6)					
Rural	1.12	1.81 1.6	57		
Kulal	(0.94)	(1.125) (1.	35)		
I∃rhan	1.43	2.10 0.7	5		
Orban	(1.04)	(1.15) (0.1	90)		
Coastal	1.31	3.93 1.6	51		
	(1.02)	(1.64) (1.	16)		
Note. standard deviations in parentheses					

Table 1: Mean conception scores on Climate Change Concept Test among community members from three types of communities.

(*Source*: Prudente, et al.⁹)

These findings point to the importance of local stories to inform residents of the Philippines about the environmental issues directly affecting their communities. For instance, as Prudente at al. covers, the expected increase in typhoons will have a greater impact on coastal Philippines communities: "storm surges are projected to affect about 14% of the total population and 42% of the coastal population."⁹. And, as the article states, "In rural communities, climate-related impacts are expected to reduce agricultural productivity." While the study elucidates the localized impacts of climate change, it also, unfortunately, shows high levels of ignorance toward these impacts. This combination of ignorance and apathy, unfortunately, results in "low sense of

responsibility to provide solutions, [low] optimism for a positive result, and [low] commitment

to reduce the impact of climate change."¹³

Figure 2. Filipino	Concern About	Climate Chang	ge by Con	imunity Type	and Age	Group
			, ,	~ ~ 1	0	

of communities	•			
	Community Members			
Community	Elementary	High	Adult	
Туре	Pupils	School	Community	
Concern				
Rural	2.58 (0.65)	2.96	2.83 (0.39)	
Urban	2.63 (0.63)	2.95	2.65 (0.58)	
Coastal	2.56 (0.57)	2.87	2.46 (0.55)	
Optimism			<u> </u>	
Rural	2.18	2.58 (0.73)	2.53 (0.75)	
Urban	2.41	2.84 (0.67)	2.30 (0.72)	
Coastal	2.27	2.82 (0.79)	2.29 (0.51)	
Responsibility				
Rural	2.11	2.65 (0.83)	2.35 (0.62)	
Urban	2.25	2.80 (0.66)	2.30 (0.56)	
Coastal	2.15	2.59 (0.57)	2.17 (0.52)	
Commitment				
Rural	2.25	2.53 (0.64)	2.50 (0.64)	
Urban	2.50	2.80 (0.63)	2.28 (0.64)	
Coastal	2.37	2.67 (0.56)	2.41 (0.71)	

Table 3. Mean attitude ratings toward climate change among community members from three types of communities.

Note. N = 759, standard deviations in parentheses; Scale: 1=strongly disagree, 2=disagree, 3=agree, 4=strongly agree

(*Source*: Prudente et al.)

¹³Maricar S. Prudente, Socorro E. Aguja, and C. Anito Jovito, "Exploring Climate Change Conceptions and Attitudes: Drawing Implications for a Framework on Environmental Literacy," *Advanced Science Letters* 21, no. 7 (2015): |2416|, accessed November 15, 2021, doi:10.1166/asl.2015.6294)

To improve concern and concept scores in the age range of Elementary Pupils (who will eventually grow to make up the High School and Adult populations of the Philippines), the child-friendly picture book is a candidate. Already working toward this goal, Filipino children's book authors have stepped in.

The Philippine-based publishing house, Adarna Book Services Incorporated, offers audiences *Bakawan*, a picture book about environmental choices in light of anthropogenic (human-caused) climate degradation.¹⁴ According to the company's website, "Adarna House... began in 1980, when it was founded to respond to the need of Filipino children to develop their minds through enjoyable learning opportunities and memorable literary experiences." Adarna House employs "Filipino writers, illustrators, and researchers" to produce local children's media that "feature Filipino values, culture, history, and experiences."¹⁴ This is unique among the children's literature industry landscape. As Penn State professor of language and literacy, Dan Hade, explains, one issue with the children's book industry is that "nearly 80 percent of children's books are published by only eight companies."¹⁵ Ownership of publishing houses is trending toward conglomeration by giants like Disney and Viacom. Hade continues, "this consolidation of power can be harmful to the development of children, as fewer voices are heard." Local stories that incorporate regional ecosystems might not otherwise be published by giants, so independent authors are crucial. Additionally, *Bakawan* is originally in Tagalog, one of the major languages of the Philippines. Native language literature benefits children's literacy in other languages too, setting them up for better success in the classroom and, in turn, a better

^{14 &}quot;About Us - Adarna House." n.d. Adarna House. Accessed November 30, 2021. https://adarna.com.ph/pages/about-us.

¹⁵ Trotter, April. "Story Power! The Impact of Children's Literature." Penn State University. April 09, 2007. Accessed November 30, 2021.

https://www.psu.edu/news/research/story/story-power-impact-childrens-literature/.

opportunity to learn about climate change.¹⁶ To make appeals for climate action more appealing and resonant to children, picture books should therefore incorporate more localized content and, when applicable, language. This recommendation would promote independent publishers and, as a result, the diversification (and radicalization) of children's literature.

Bakawan, written by Catherine Yu Untalan and published in 2009, is the story of a coastal mangrove and its animal inhabitants as they are inundated with increasing amounts of pollution. A "bakawan" is a tree native to the Philippines that is used for dyes, boat construction, charcoal, and other material derivatives. These trees are commonly found in coastal mangroves at the edges of water bodies. At the synapse of their roots and the waterway's edge, bakawan are home to a diversity of marine life. Beyond acting as host to these species, bakawan mangroves play a significant role in sheltering the Philippines from severe storms that approach the archipelago. In November of 2013, when Typhoon Haiyan struck the Philippines, bakawan mangroves suffered great damage. As the impacts of climate change worsen, the damage of bakawan serves as a reminder. In coastal regions, especially, plantations of Rhizophora (a monospecific type of bakawan) are being evaluated as a form of typhoon protection.¹⁷ As Prudente et al.'s research indicated, concerns about climate change vary by region of the Philippines. By centering *Bakawan* on a recognizable species of tree native to the Philippines, author Yu Untalan personalizes the story and makes an appeal for heightened concern.

At the outset of the story *Bakawan* (in English translation from original Tagalog), "Animals lead peaceful lives in Bakawan. Their resources are bountiful and their habitat is safe."

¹⁶ Hancock, Dawson R. 2009. "The Effects of Native Language Books on the Pre-Literacy Skill Development of Language Minority Kindergartners." *Journal of Research in Childhood Education* 17, no. 1 (November): 62-68. https://doi.org/10.1080/02568540209594999.

¹⁷ Villamayor, Betty May R., Rene N. Rollon, Maricar S. Samson, Giannina Marie G. Albana, and Jurgenne H. Primavera. 2016. "Impact of Haiyan on

Philippine mangroves: Implications to the fate of the widespread monospecific Rhizophora plantations against strong typhoons." Ocean & Coastal Management 132 (November): 1-14. https://doi.org/10.1016/j.ocecoaman.2016.07.011.

Main character Tagak, a native bird, flies around the ecosystem and collects what he perceives as interesting objects. Over time, however, Tagak realizes these items are damaging. Plastic bottles, oil, and fishing nets are illustrated crowding the mangrove. The animals—which include native species such as the Danggit fish—at first wonder what to do with the waste that has collected around them. "What if we submerged them underwater?" they ask, "What if we bring them to the farthest corner of the forest?" The animals' queries mimic the naivete of children who don't understand the complexities of waste disposal and sources of pollution. In the end, the animals learn how to separate their trash and recycling at a waste center. This aspect of the book would, as Echterling criticizes, enable a passive and simplified, rather than involved and systemic, explanation of anthropogenic climate change.

Figure 3. Animals at the Bakawan mangrove consider how to dispose of trash.



(Source: Push to Read Project¹⁸)

¹⁸ Push to Read Project. 2020. "Bakawan (English Version)." YouTube. https://www.youtube.com/watch?v=ibVQ88SOROs.

The localization of *Bakawan*, though, seems to heighten its impact. In a study that calls for child-sensitive adaptations to climate change in the Philippines, researcher Berse states, "Most children linked climate change to high-profile disasters, such as massive flooding. Some children, however, linked climate change to slow and less dramatic impacts on their everyday lives, such as a decline in fish and the resulting economic loss for the community."¹⁹ While *Bakawan* lacks a structural explanation of the oil or fishing industries, it does offer Filipino children familiar characters and setting. For children in coastal communities , plastic-polluted waters may be a familiar sight, and native species may also encourage readers to resonate with the story.

Bakawan is just one example that demonstrates the benefits and drawbacks of contemporary environmental children's literature styles. An oversimplification of issues stunts children's abilities to process the complex aspects of climate change necessary to overcoming its impacts, for one. Additionally, an over-reliance on individual eco-friendly actions limits the opportunity for children to engage in questions of how they might affect change outside their own homes, schools, and communities. *Bakawan* teaches authors, however, that utilizing local imagery and themes can make a story resonate more with a child. If independent publishers are given more spotlight, there is opportunity for native language children's literature to grow. As the magnifying effects of climate change bear their teeth at upcoming generations, children at the highest risk of harm—like those in the Philippines—deserve access to complex storylines that prioritize civic engagement and regional content. Authors of children's literature would be wise to take these lessons into account across the globe, so as to promote a necessary generation of environmental conservators.

¹⁹ Berse, K. 2017. "Climate change from the lens of Malolos children: Perception, impact, and adaptation." *Disaster Prevention and Management: An International Journal* 26 (2). https://naaee.org/eepro/research/library/climate-change-lens-malolos-children.

References

- "About Us Adarna House." n.d. Adarna House. Accessed November 30, 2021. https://adarna.com.ph/pages/about-us.
- Berse, K. 2017. "Climate change from the lens of Malolos children: Perception, impact, and adaptation." *Disaster Prevention and Management: An International Journal* 26 (2). https://naaee.org/eepro/research/library/climate-change-lens-malolos-children.
- "Climate change and disaster displacement." n.d. UNHCR. Accessed December 2, 2021. https://www.unhcr.org/en-us/climate-change-and-disasters.html.
- Echterling, Clare. 2016. "How to Save the World and Other lessons from Children's Environmental Literature." *Children's Literature in Education* 47, no. December 2016 (August): 283-299. <u>https://doi.org/10.1007/s10583-016-9290-6</u>.
- Edwards, Ben, Matthew Gray, and Judith Borja. "The Influence of Natural Disasters on Violence, Mental Health, Food Insecurity, and Stunting in the Philippines: Findings from a Nationally Representative Cohort." *SSM - Population Health* 15 (May 14, 2021): 1-7. Accessed November 29, 2021. doi:10.1016/j.ssmph.2021.100825.
- Environmental Protection Agency. 2021. "Learn About Environmental Justice | US EPA." Environmental Protection Agency.

https://www.epa.gov/environmentaljustice/learn-about-environmental-justice.

Henson, Bob. "Key Takeaways from the New IPCC Report " Yale Climate Connections." Yale Climate Connections. August 09, 2021. Accessed November 30, 2021. https://yaleclimateconnections.org/2021/08/key-takeaways-from-the-new-ipcc-report/. Hsiao, Ching-Yuan, and Pei-Yu Shih. "Exploring the Effectiveness of Picture Books for Teaching Young Children the Concepts of Environmental Protection." *International Research in Geographical and Environmental Education* 25, no. 1 (2015): 36-49. Accessed November 25, 2021. doi:10.1080/10382046.2015.1106203.

Flores, Maverick. 2018. "Mabi David, author of 'Paano Kumain ng Kulay?'" Greenpeace. <u>https://www.greenpeace.org/philippines/story/836/mabi-david-author-of-paano-kumain-ng-kulay/</u>.

- Hancock, Dawson R. 2009. "The Effects of Native Language Books on the Pre-Literacy Skill Development of Language Minority Kindergartners." *Journal of Research in Childhood Education* 17, no. 1 (November): 62-68. <u>https://doi.org/10.1080/02568540209594999</u>.
- Intergovernmental Panel on Climate Change. 2021. "Climate Change 2021: The Physical Science Basis, Summary for Policy Makers."

https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM_final.pdf.

- Kaplan, Sarah. 2021. "Climate change to bring today's kids 3 times the disasters, Science study finds." *The Washington Post*, September 26, 2021. <u>https://www.washingtonpost.com/climate-environment/2021/09/26/change-disasters-kids</u> -science-study/.
- Monhardt, Rebecca, and Leigh Monhardt. 2000. "Children's literature and environmental issues: Heart over mind?" *Reading Horizons: A Journal of Literacy and Language Arts* 40, no. 3 (February): 1-11.

https://scholarworks.wmich.edu/cgi/viewcontent.cgi?article=1218&context=reading_hori zons. Nel, Philip. 2011. "Radical Children's Literature Now!" *Children's Literature Association Quarterly* 36, no. 4 (January): 445-473. DOI:10.1353/chq.2011.0040.

- Lee, Katharine, Nathalia Gjersoe, Saffron O'Neill, and Julie Barnett. "Youth Perceptions of Climate Change: A Narrative Synthesis." WIREs Climate Change 11, no. 3 (2020). Accessed October 2, 2021. doi:10.1002/wcc.641.
- Prudente, Maricar S., Socorro E. Aguja, and C. Anito Jovito. "Exploring Climate Change Conceptions and Attitudes: Drawing Implications for a Framework on Environmental Literacy." *Advanced Science Letters* 21, no. 7 (2015): 2413-418. Accessed November 15, 2021. doi:10.1166/asl.2015.6294.
- Push to Read Project. 2020. "Bakawan (English Version)." YouTube. <u>https://www.youtube.com/watch?v=ibVQ88SOROs</u>.
- Push to Read Project. 2020. "Bakawan (Filipino Version)." YouTube. https://www.youtube.com/watch?v=eAVwwBNEvR0.
- "Saffir-Simpson Hurricane Wind Scale." n.d. National Hurricane Center. Accessed December 2, 2021. <u>https://www.nhc.noaa.gov/aboutsshws.php</u>.
- The Climate Crisis Is a Child's Rights Crisis: Introducing the Child's Climate Risk Index. Report. United Nations Children's Fund (UNICEF). Summary ed. 2021.
- Trotter, April. "Story Power! The Impact of Children's Literature." Penn State University. April 09, 2007. Accessed November 30, 2021.

https://www.psu.edu/news/research/story/story-power-impact-childrens-literature/.

Villamayor, Betty May R., Rene N. Rollon, Maricar S. Samson, Giannina Marie G. Albana, and Jurgenne H. Primavera. 2016. "Impact of Haiyan on Philippine mangroves: Implications to the fate of the widespread monospecific Rhizophora plantations against strong typhoons." Ocean & Coastal Management 132 (November): 1-14. https://doi.org/10.1016/j.ocecoaman.2016.07.011.

Witt, Susan D., and Katherine P. Kimple. "'How Does Your Garden Grow?' Teaching Preschool Children about the Environment." *Early Child Development and Care* 178, no. 1 (December 14, 2008): 41-48. Accessed December 1, 2021. doi:10.1080/03004430600601156.