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SCHOOL OF LIVING TRADITIONS ON AETA MAGBUKON INDIGENOUS KNOWLEDGE: PROMOTING INDIGENOUS FOOD PLANTS FOR FOOD SECURITY

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ABSTRACT

This study focused on promoting indigenous food plants (IFPs) for food security through a School of Living Traditions (SLT) on the indigenous knowledge (IK) of the Aeta Magbukon. The study used the qualitative ethnographic research method as it employed focus group discussions, which were participated by 30 Aeta Magbukon people aged 11-18 years and 7 Cultural Masters aged 55-69 for the duration of the 3 SLTs and 1 radio program. The participants' interest and the sincerity of the Cultural Masters were considerably noted to ensure the data's credibility. The study documented 35 species of IFPs and 15 traditional cooking methods taught by the Cultural Masters of the Aeta Magbukon, ensuring the transmission of indigenous skills and techniques. SLTs are a decent strategy to preserve IK because they uphold the nation's historical and cultural heritage. Moreover, SLTs help preserves and assimilate traditional culture and its various artistic expressions as a thriving component of national culture. Government institutions other than the National Commission for Culture and the Arts must also take responsibility in disseminating the value of IFPs in achieving food security and create policies and ordinances to protect forests where IFPs are sourced. Furthermore, the study highlighted the lack of existing investigation on the nutritional value and health benefits of IFPs.

Keywords: Aeta Magbukon; indigenous food plants (IFPs); School of Living Traditions (SLT); indigenous knowledge (IK); food security

1. INTRODUCTION

The United Nations Educational Scientific and Cultural Organization (UNESCO) states that there are two methods to preserve the culture of a tribe. One is recording cultural practices in tangible form and archiving them, and the other involves preserving cultural heritage by ensuring that it will be transmitted to the next generations. The School of Living Traditions (SLT) programs are the response of the National Commission for Culture and the Arts (NCCA) to the second method. SLTs help transfers indigenous knowledge (IK) to young people within the same ethnolinguistic community. These programs also encourage cultural

specialists to continue their work and train young people to replace them in the future. Furthermore, SLTs allow cultural specialists, particularly those with skills and knowledge on traditional art and other IK, to teach a group of interested young people responsible for passing it on to future students (NCCA, 2019).

According to UNESCO (2017), IK refers to the understandings, skills, and philosophies developed by societies with extensive histories of interaction with their natural environments. This distinctive way of knowledge management is essential to the world's cultural diversity, providing a foundation for appropriate and sustainable development. However, IK is often taken for granted, discriminated against, or brushed aside as insignificant (Cariño, 2009). However, for the indigenous peoples (IPs) who practice this knowledge daily, it is a way of life. Cariño describes IK as a viable and sustainable resource for future generations, particularly in sustaining food security for IPs. According to the Food and Agriculture Organization of the United Nations (FAO, 2009), millions of traditional farmers and indigenous communities within a wide range of ecosystems worldwide use IK for food and livelihood security.

The Ayta Magbukon are an indigenous tribe living in the Bataan Natural Park (Calderon et al., 2015). As stated by the National Commission on Indigenous Peoples (NCIP), the Aeta Magbukon have lived on the Bataan Peninsula since time immemorial and have kept a large portion of their ancestral land and live in harmony with the lowland population that surrounds them. Although the development of the province provided new opportunities for the people, but it also altered some aspects of the indigenous Aeta Magbukon culture (NCIP, 2020). The first settlers arrived in Biaan Mariveles, Bataan, in the middle of this town's mountainous ranges. Through the years, as the tribe's population became denser, they settled in the following places across Bataan: (1) Dangcol, City of Balanga; (2) Kinaragan, Limay; (3) Kanawan, Morong; (4) Pita, Bayan-bayanan, in Orion: (5) Pag-asa, Orani (6) Ulingan, Matalangaw, and Magduhat, all in Bagac; (7) Sitio Luoban in Samal; and (8) Bangkal in Abucay (David, 2013). At present, the Aeta Magbukon continues to assimilate with modern life (Aeta Tribes Foundation, 2017). In this scenario, there is a risk of the tribe's IK disappearing as its younger generation further neglects their IK over modern lifestyles. Preserving the tribe's IK will prove to be more advantageous in the long term because they are not always economically capable of purchasing food in the market. In Cariño's (2009) paper, the author appreciated the growing contributions of IK and the use of indigenous food plants (IFPs) for food security. Moreover, IK is valuable not only to indigenous peoples (IPs) but to society in general.

IFPs are edible plants native to a region or country and considered "indigenous" because they naturally grow in specific areas (Shava, 2000). According to Berkelaar (2011), IFPs are usually a significant part of the local diet for the following reasons. (1) IFPs tend to be very healthy, often more nutritious than common plant produce. (2) Indigenous crops are well-adapted to the regions they originate from. They are typically free from pests and diseases and can grow in severe conditions. (3) The diversity behind edible IFPs also contributes to food security. Therefore, preserving IK on IFPs for food security through SLT programs is one of the most notable actions a government can do to help mitigate food inadequacy among IPs.

Promoting food security and the consumption of IFPs through an SLT is a welcome approach because it focuses on the IK of the Aeta Magbukon. Nonetheless, the extent of the knowledge and practice of the Aeta Magbukon participants on their IFPs is diminishing, even as some claim to be knowledgeable of the details. Root crops such as ube (forest yam; Dioscorea alata) and lima-lima (Schefflera odorata Blanco) are among those the participants mainly know about. They also know edible leaves such as pingol bato (Begonia nigritarum Steud), pakong ula (Athyrium esculentum), and binucao (Garcinia binucao [Blanco] Choisy). Unfortunately, a majority of the Aeta Magbukon participants do not know and consume their IFPs anymore because of economic activity and the encroachment of the non-Aeta populace on their ancestral lands. Moreover, the Aeta's traditional livelihood, IFPs, and way of life are threatened (Balila et al., 2013), posing a significant danger to the awareness of the Aeta Magbukon on their IK.

The study titled "School of Living Traditions on Aeta Magbukon Indigenous Knowledge: Promoting Indigenous Food Plants for Food Security" is part of a series of SLT programs, which are all funded by the NCCA.

(1) "Ayta Magbukon School of Living Traditions: Preparatory Phase" under Resolution No. SCCTA-CNCC-2009-15, with fifty thousand pesos (PHP 50,000.00) chargeable to the program's funds on the Conservation of Cultural Heritage / Preservation and Protection of the Cultural Treasures of Cultural Communities, with a memorandum of agreement (MOA) that ran from January to July 2009;

(2) "Bataan Ayta Magbukon Radio Program: Sa Kabukilan" under Resolution No. 2009-311, with two hundred thousand pesos (PHP 200.000.00) chargeable to the Promotion of Culture and the Arts-Media, Culture and Values Enhancement Projects, with an MOA that ran from April to October 2010;

(3) "Bangkal, Abucay, Bataan SLT on Traditional Songs, Dances, Indigenous Knowledge of Ayta Phase 1" under Resolution No. 2012-140, with one hundred eighty-four thousand five hundred pesos (PHP 184,500.00) chargeable to the Program of Conservation of Cultural Heritage, with an MOA that ran from January to July 2012; and

(4) "Bangkal, Abucay, Bataan School of Living Traditions on Aeta Indigenous Knowledge Phase 2" under Resolution No. 2014-009, with two hundred thousand pesos (PHP 200,000.00) chargeable to the Program on Conservation of Cultural Heritage / Preservation and Protection of Cultural Treasures of Cultural Communities (Intangible Heritage), with an MOA that ran from November 2014 to September 2015.

After each SLT program was funded by the NCCA, the entire initiative continued as an extension activity when it was turned over to the Bataan Peninsula State University (BPSU) from January 2016 to the present. However, the program activities were suspended because of COVID-19 but will continue after the pandemic.

As expressed by FAO, "food security exists when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (FAO World Food Summit, 1996; Pérez-Escamilla, 2017; Msuya et al., 2010). In particular, food security for the Aeta Magbukon is being able to eat three times a day.

The State of the World Series of FAO, International Fund for Agricultural Development, United Nations Children's Fund, World Food Programme, and World Health Organization (2019) declared that more than 820 million people in the world are still hungry today, underscoring the immense challenge of achieving the Zero Hunger target of the United Nations (UN) by 2030. The report further stated that about two billion people in the world experience moderate to severe food insecurity. Indigenous groups across the world account for 370–500 million individuals in more than 90 countries (UNESCO, 2019). They constitute 5% of the world's general population and 15% of the world's poor population (International Labour Organization, 2019). In the Philippines, poverty, food insecurity, and malnutrition remain critical issues (Angeles-Agdeppa, 2009), which are especially observed among indigenous groups. A report by the Social Weather Stations (SWS) revealed that Filipino families facing "involuntary" hunger escalated to a projected 10% in the second quarter of 2019. This is roughly equivalent to 2.5 million individuals—higher than the 2.3 million or 9.5% last March 2019 (Sunstar, 2019). The number of IPs vulnerable to food insecurity is roughly 10%–20% of the Philippines' total population of 102.9 million (International Work Group for Indigenous Affairs, 2019).

Furthermore, Cassio (2020) specified that during the emergence of the coronavirus pandemic (COVID-19), 900 million people worldwide lacked access to sufficient food, making the present challenge to achieve food security incredibly serious. Moreover, within this population that lacked sufficient food, at least 155 million people suffer from severe food deficiencies, further aggravated by the pandemic.

The Global Report on Food Crises (GRFC, 2020) offered timely data on acute hunger problems by region and country. According to the report, the COVID-19 pandemic may worsen the unfavorable conditions experienced by populations with acute or critical food security. A statement made by FAO (2020) stressed that COVID-19 is significantly affecting the food security and nutrition of different populations, including increasingly vulnerable IPs who are already facing inequalities, discrimination, marginalization, lack of recognition, and invisibility. Moreover, these vulnerabilities make IPs more at risk of the negative effects of the pandemic on their health and socioeconomic status.

Yon Fernández de Larrinoa, Head of the FAO Indigenous Peoples Unit, insists that IPs' right to food directly depends on whether their livelihood, food systems, and traditional knowledge are recognized and respected. Myrna Cunningham, Chair of the Fund for the Development of the Indigenous Peoples of Latin America and the Caribbean (FILAC), further supported this by saying that preserving indigenous peoples' food systems is critical to building resilience and food security (FAO, 2020).

FAO's vision and belief for the indigenous people to overcome food insecurity, especially during the COVID-19 pandemic, are in line with the underlying aspirations of SLTs, as managed by the NCCA across the Philippines. This program strives to preserve IK for posterity and attain food security by preserving IK on IFPs.

With the recent report of FAO and GRFC about food insecurity and hunger worldwide, many researchers, government institutions, NGOs, and private organizations have realized IFPs' potential for food security and hunger alleviation. The enormous potential of native or indigenous crops worldwide for food security is evidenced by several published articles (Ohiokpehai, 2003; Food and Agriculture Organization of the United Nations Centre for Indigenous Peoples' Nutrition and Environment, 2013; Cordeiro, 2013; Mbhenyane et al., 2013; Africa Research Online, 2015; Cidro et al., 2015; Pichop et al., 2016; Van Der Merwe et al., 2016). Furthermore, the significant role of IK in enhancing food security is further supported by several studies from different parts of the world (Shava, 2005; Agea et al., 2008; Termote et al., 2010; Tshering et al., 2014; Kamwendo and Kamwendo, 2014; Hanazaki et al., 2018; Janke, 2018; Mhache, 2018; Cámara-Leret et. al., 2019; Díaz-José et al., 2019; Punchay et al., 2020) and in the Philippines (Alegado and De Guzman, 2014; Orticio, 2007; Sibol ng Agham at Teknolohiya, 2009; Neyra, 2009; Antonio et al., 2010; Ong and Kim, 2017; Bernadas and Peralta, 2017).

The SLT program plays a significant role for both basic and higher education because the absence of indigenous education will cause the indigenous youth to grow apart from their cultures. Education is the key to self-determination (United Nations, 2003), and teaching cultural heritage to students will immediately guide them to appreciating their culture as well as that of others (Battista, 2019). Furthermore, the Philippine government has taken significant steps of including indigenous education in curricula for basic education (Department of Education (DepEd), 2011; DepEd, 2015; DepEd, 2016; DepEd, 2017) and higher education (Commission on Higher Education, 2019).

Meanwhile, the SLT program will be useful for an international agency such as UNESCO, which can replicate the initiative in other countries. Likewise, the NCCA can tap more communities to adopt the program, especially in areas where IFPs grow.

2. OBJECTIVES OF THE STUDY

This study focuses on promoting IFPs for food security through an SLT for the Aeta Magbukon. The tribe's IK will be preserved through the transmission of indigenous skills and techniques from the Cultural Masters to the group's younger members. In particular, the study will highlight the tribe's IK on IFPs, including the traditional way of cooking IFPs. It also seeks to encourage the tribe, especially its younger members, to consume IFPs for food security, particularly during the COVID-19 pandemic. Study participants are expected to become more knowledgeable on IFPs to the extent where knowledge is effectively transferred to the next generation.

3. METHODOLOGY

The qualitative ethnography method of research was used for this study. Focus group discussions (FGDs) were conducted using an audio recorder, camera, and field notes. According to Creswell (2003), the study uses a method "in which the researcher studies an intact cultural group in a natural setting over a prolonged period by collecting, primarily, observational data." Moreover, Creswell's method involves other activities such as gaining access to the site, establishing rapport and building trust, immersion, participant observations, interviews, and FGDs.

The researcher acquired data from the Cultural Masters of their knowledge and understanding about IFPs and their preparation process. For the program, group discussions and interviews were conducted as the primary data-gathering tools of acquiring knowledge and skills about IFPs and how to cook them. All the data collected went through triangulation and member checking (Creswell and Miller, 2000) to ensure that all information given by the Cultural Masters was correct. The data was then presented to all the Cultural Masters for the second time along with selected members of the Council of Elders and the Tribal Council to discuss any possible revisions. When everyone agreed on the presented data, the researcher carefully transcribed the material to make the final copy. It was again presented to the group for further validation. The data was then made into a learning module, and it was used by the Cultural Masters when imparting IK about IFPs.

Before starting the SLT program, the researcher coordinated with the NCIP and the NCCA because the two agencies are under the Office of the President and directly work for the welfare of IPs.

Selecting the Cultural Masters and Students of the SLT

The selection of the Cultural Masters was based on their knowledge of indigenous skills and cultural traditions. Moreover, the recommendations of the Tribal Council, Council of Elders, and Tribal Chieftains were also a significant factor in determining the right persons. Among the selected Cultural Masters is the Tribal Chieftain of Bangkal, and currently, she serves as a Provincial Board Member in Bataan, Philippines, under NCIP Administrative Order No. 1 Series of 1998 (NCIP, 1998). Another Cultural Master is a permanent employee at NCIP Bataan and a former Secretary of the Northern Community of the NCCA. She was awarded by the NCCA for her contributions to the SLT programs. The remaining five Cultural Masters are all from the Council of Elders and duly recognized by the Aeta Tribe as bearers of cultural knowledge. They were responsible for teaching their craft to a group of learners.

Based on the NCCA guidelines, the students of the SLT are limited only to young people from the same ethnolinguistic community. They were selected based on their willingness to learn the craft and with permission from their parents. The number of students per SLT was based on the approved budget of the NCCA and set to 30 students per program, which was divided into the Preparatory Phase, Phase 1, Phase 2, and the Aeta Magbukon Radio Program.

Duration of the SLT Programs

The "Magbukon School of Living Traditions: Preparatory Phase" lasted from January to July 2012. Meanwhile, the "Bataan Ayta Magbukon Radio Program: Sa Kabukilan" lasted from April to October 2010. The "Bangkal, Abucay, Bataan SLT on Traditional Songs, Dances, Indigenous Knowledge of Ayta Phase 1" lasted from January to July 2012, while the "Bangkal, Abucay, Bataan School of Living Traditions on Aeta Indigenous Knowledge Phase 2" lasted from November 2014 to September 2015. In total, the three SLTs and one radio program lasted for two and a half years. The initiative was further extended starting January 2016, when it was conducted as an extension activity of the researcher under BPSU. The program is ongoing but temporarily suspended because of COVID-19.

Ethical Considerations

The current study required the strict observance of research ethics (National Committees for Research Ethics in Norway, 2006). First, the researcher secured the necessary permission and free, prior, and informed consent (FPIC) from the NCIP Balanga Chapter. Aside from the permission granted by the NCIP, the researcher also asked for consent from the Tribal Council, Council of Elders, Tribal Chieftains, and the parents of the SLT students. After securing formal approval, the researcher had to convince the members of the tribe of the study's importance and projected benefits.

During the data collection and triangulation, the group discussions were conducted within an encouraging environment both conducive and free from any stressors that can harm the physical and psychological well-being of the Cultural Masters, selected members of the Council of Elders, and the Tribal Council. The interviews and group discussions were sensitive to the personal acceptance of the participants. Moreover, the level of dedication of the Cultural Masters, selected members of the Council of Elders, and the Tribal Council was measured through their full consent before the interview. The researchers informed the participants beforehand of the program's purpose and its relevance to the community to avoid possible deception and ambiguity about the interview and group discussions' objectives.

Additionally, the interview and group discussions acknowledged the significance of effective communication, as certain obstacles, such as language, could contribute to conflicts of interest and misunderstandings. Thus, the researcher asked the group of the most suitable language that can be used aside from Magbukon, which is their dialect. All participants spoke Tagalog, and both parties agreed that it be used for all communications.

Documentation of activities, including taking pictures and videos, is highly important, as it is part of the study's cultural conservation efforts. Therefore, all photographs and videos collected throughout the program were submitted and approved by the group to be used by the researcher and the NCCA based on the program's objective.

4. RESULTS AND DISCUSSION

The program is in line with the Sustainable Development Goals (SDGs) implemented by all UN Member States since 2015, which provides a shared blueprint for peace and prosperity for both people and the planet. The SGDs consist of 17 goals that serve as urgent calls to action for all countries, regardless of whether they are developed or developing nations (UN-DESA, 2020). This study focuses on the second goal, which is to end hunger, achieve food security, improve nutrition, and promote sustainable agriculture.

Many studies about IPs consistently reveal their vulnerability to household food insecurity (Huet et al., 2012; Temple and Russel, 2018; Ogundiran, 2019; Torres-Vitolas et al., 2019; Law et al., 2018; Skinner et al., 2016; Lemke and Delormier, 2017; Lugo-Morin, 2020; Lecompte et al., n.d.). Knowledge on how to attain food security is essential to IPs, specifically to the Aeta Magbukon, who often experience financial poverty as well as live and depend on natural resources from the forest, which are continuously being encroached by the non-Aeta population.

SLT student 1:

"Hindi naman kami mayaman, at kadalasan nauubusan kami ng pagkain. Gusto namin matutunan ang mga ituturo ng aming mga Apo para kung nauubusan kami ng pagkain, alam na namin ang aming gagawin."

(We are not rich, and we often run out of food. We want to learn what our elders wish to teach us so that when we run out of food, we'd know what to do.)

SLT student 2:

"Maraming halaman ang puwedeng pagkain sa gubat. Gusto namin matutunan para maituro rin namin sa aming mga kapatid."

(There are many edible plants in the forest. We want to know more about these plants so that we can teach them to our brothers and sisters as well.)

The program was conducted before the COVID-19 pandemic. Before the outbreak, food insecurity was already on the rise among various populations, especially with IPs, as stated by various FAO and GFRC reports. This pandemic is an additional threat to food security. Therefore, the Cultural Masters believe that SLTs will show how necessary IK is in preserving IFPs and mitigating food insecurity among IPs during a pandemic.

Cultural Masters:

"Naniniwala kami na ang ganitong uri ng programa ay napakahalaga para sa pagpapanatili ng aming kaalaman tungkol sa mga pagkaing halaman na sa kagubatan lamang matatagpuan. Ang mga halamang ito ay isa sa mga pinagkukunan namin ng pagkain, lalong-lalo na kung mahirap ang buhay."

(We believe that this kind of program is useful for maintaining our knowledge on food plants that can only be found in the forest. These plants are our food sources, especially when life is hard.)

Apo Vicky (Cultural Master and NCCA Awardee):

"Napakahalagang maituro ito sa aming mga kabataan upang may pumalit sa amin sa susunod na henerasyon. Sa aming pananaw, unti-unti nang naglalaho ang ganitong kaalaman dahil na rin sa mas pinipili na ng nakararami ang pagbili na lamang ng mga pagkain sa palengke. Pero ang mga katutubo ay hindi naman palaging may pera. Ano ang gagawin ng isang katutubo kung wala na siyang makain? Pupunta siya sa gubat, at doon, napakaraming pagkaing makukuha at libre pa. Ito ang kaalamang dapat naming maituro at maipaunawa sa aming mga kabataan."

(We should teach this to our young people so that someone can take our place in the next generation. In our opinion, this knowledge is slowly disappearing because most of us prefer to buy food in the market. But indigenous people don't always have the money. What else can we do if we don't have anything to eat? IPs would go to the forest. There's plenty of food available there, and they're all free. This kind of knowledge is what we need to teach to our young people.)

The photo below captures the Cultural Masters and the students of the SLT, taken during the closing ceremony of Bangkal, Abucay, Bataan School of Living Traditions on Aeta Indigenous Knowledge Phase 2.

Figure 1: The Aeta Magbukon Cultural Masters and the Participants

The researcher and the Cultural Masters were able to document 35 species of IFPs. A majority of the IFPs are located at Barangay Bangkal in Abucay, Bataan, Philippines, which shows that Bangkal is still rich in natural food sources from the forest. However, this is not the case in other Aeta Magbukon communities in which the Cultural Masters agree that some IFPs are being depleted by illegal logging (Sapnu, 2011; Punongbayan, 2011; Gonzaga, 2012; Siytangco, 2018; Lasco, 2013), slash-and-burn agriculture, and illegal harvesting.

Apo Kardo (Cultural Master):

"Sana lang matigil na ang mga pagpuputol ng puno sa aming ancestral domain. Nakakatakot isipin na ito ay maubos dahil sa mga bawal na gawain. Paano na ang mga katutubo na dito umaasa ng kanilang ikinabubuhay?"

(I just hope that we can stop the cutting down of trees in our ancestral domain. It's alarming to think that it will be depleted because of illegal activities. What will happen to the IPs who depend on the mountain for their livelihood?)

SLT student 3:

"Sa aming mga katutubo, ang kagubatan ang bumubuhay sa amin. Dito kumukuha sila ama ng aming ikinabubuhay kaya napakahalaga nito sa amin."

(The forest sustains our livelihood as IPs. This is where our dad gets his livelihood, so it's essential to us.)

Table 1 shows the list of identified IFPs used by the Aeta Magbukon, and it also indicates the botanical and family name classification of the plant and its edible parts.

Table 1: Identified Indigenous Plants Used as Food by the Aeta Magbukon

Official Common Name	Botanical Name	Family Name	Edible Part
1. Aluloy	*Gonostegia hirta*	Urticaceae	Fruits
2. Alupag	*Euphoria didyma* Blanco	Sapindaceae	Fruits
3. Anonang	*Cordia dichotoma* Forst. f.	Boraginaceae	Fruits
4. Ayumit	*Ficus minahassae (Teijsm. & Vriese)* Miq.	Moraceae	Fruits
5. Antipolo	*Artocarpus blancoi*	Moraceae	Young fruits
6. Babayan	*Alleanthus luzonicus var. glaber (Warb.) Merr*	Moraceae	Leaves, young fruits
7. Bignay	*Atidesma bunius*	Euphorbiaceae	Fruits
8. Binucao	*Garcinia binucao* (Blanco) Choisy	Clusiaceae	Leaves
9. Bunga	*Adonidia merilli* (Becc.) Becc.	Palmaceae	Fruit
10. Bulak Manok	*Ageratum conyzoides* Linn	Asteraceae	Leaves
11. Buloy	*Dioscorea divaricata Blco*	Dioscoreaceae	Matured roots
12. Bitongol	*Flacoutia ukam* Zollinger et Moritz	Flacourtiaceae	Fruits
13. Dampali/Taraumpalit	*Sesuvium portulacastrum*	Aizoaceae	Leaves
14. Datiles	*Muntigia carabola*	Flacourtiaceae	Fruits
15. Ditaan	*Daemonorps mollis*	Palmaceae	Shoots and fruits
16. Himbabao	*Broussonetia luzonica* (Blanco) F. Vill	Moraceae	Leaves and flowers
17. Kalot	*Dioscorea hispida*	Dioscoreaceae	Matured roots
18. Kamagong	*Diospyros philippensis*	Ebenaceae	Fruits
19. Limuran	*Calamus ornatus*	Palmaceae	Shoots
20. Luyang dilaw	*Curcuma domestica*	Zingerberaceae	Roots
21. Lubi-lubi	*Solanum nigrum* Linn.	Solanaceae	Ripe fruits
22. Lima-lima	*Schefflera odorata* Blanco	Araliaceae	Roots
23. Mala-uban	*Calamus microcarpa* Becc.	Palmaceae	Shoots
24. Matang-ulang	*Phyllanthus rhanoidez* Retz	Euphorbiaceae	Fruits
25. Pakong ula	*Athyrium esculentum*	Aspidiaceae	Young shoots
26. Pahutan	*Mangifera altissima* Blanco	Anacardiaceae	Fruits
27. Palasan	*Calamus maximus*	Palmaceae	Shoots
28. Pingol-bato	*Begonia nigritarum* Steud,	Begoniaceae	Leaves
29. Siling-labuyo	*Capsicum frutescens* Linn.	Solanaceae	Fruits and leaves
30. Takipan	*Caryota rumphiana* Ledd. Ex Martius	Palmaceae	Shoots
31. Tanglad	*Cymbopogon citrates* (DC.) Stapf.	Poaceae	Leaves
32. Tibig	*Ficus nota (Blanco) Merr.*	Moraceae	Fruits and leaves
33. Tugi	*Diocorea esculenta* (Lour) Burkill	Dioscoreaceae	Roots
34. Tukod-langit	*Helminthotachys zeylanica*	Ophioglossaceae	Young leaves
35. Ube	*Dioscorea alata*	Dioscoreaceae	Matured roots

The Cultural Masters taught the participants how to traditionally cook IFPs. Under this topic, a majority of the ingredients included binucao, takipan, malauban, palasan, and limuran—all of which can only be found in the mountains. Other IFPs can be found near and around the community. The quality of the community's root crops, such as ube and lima-lima, are comparable to kamoteng baging (sweet potato) and kamoteng kahoy (cassava) because of their delicious taste.

Some IFPs, such as antipolo, bitungol, takipan, palasan, malauban, kamagong, and binucao, are widely used by the IPs as construction material and for furniture-making. Meanwhile, tanglad can be used as vegetative barriers to reduce soil erosion (Poudel et al., 2000; Dass et al., 2010; Mwango et al., 2014). Bignay, datiles, bitungol, and alupag are commonly used for agroforestry. These practices are IK that should be seriously considered as sustainable methods for mitigating climate change. Furthermore, the root crops tugi, ube, and lima-lima are excellent alternatives to rice.

The Cultural Masters also explained the other uses of these IFPs. Some have medicinal properties, such as alupag, anonang, kalot, lima-lima, bignay, tanglad (Tantengco et al., 2018; Lanting and Palaypayon, 2002), tibig (Tantengco et al., 2018; Stuart, 2018; Lanting and Palaypayon, 2002), malauban, palasan, limuran

(Technical Report, 2004; Yu, 2007), ayumit (Amoah, n.d.), and pingul-bato. The use of IFPs for medicinal purposes is common among indigenous tribes worldwide (Native Voices, 2019; Arnason et al., 1981; Mbhenyane, 2017). Meanwhile, some IFPs, such as kalot (Lisdiana and Yuliani, 2015; Sari et al., 2020; Banaag et al., 1997) and siling labuyo (Trizelia et al., 2017; Saxena et al., 2014), can be used as biopesticides.

Table 2 shows the list of Indigenous Food Plants thought to have medicinal properties. The table enumerated the name of the IFP, the plant part to be used, how it would be administered, and the disease or ailment to be treated.

Table 2: List of IFPs Recorded to Have Medicinal Values for the Aeta Magbukon

IFP's Name	Plant Part Used	Administration	Disease/Ailment to be Treated
1. Alupag	Leaves, stem	Drinkable decoction; body wash	Pregnancy-related complications
2. Tibig	Leaves	Apply leaves to the forehead and heated leaves to the stomach	Fever, headaches, and stomachaches
3. Anonang	Leaves, fruit, seeds, bark	Drinkable decoction or peel extract; apply scraped peel on wounds	Wounds, infections, and fever
4. Malauban	Roots	Drinkable decoction	Stomachaches
5. Palasan	Roots	Drinkable decoction	Stomachaches
6. Kalot	Roots	Apply on the affected body part	Dog bites and rabies
7. Ayumit	Leaves, bark	Drinkable decoction	Rheumatism and stringent tissue
8. Lima-lima	Leaves, roots	Drinkable decoction	Spasms and stomachaches
9. Limuran	Raw cabbage	Drinkable water from the raw cabbage	Stomachaches and diarrhea
10. Bignay	Fruits, leaves, bark	Drinkable decoction	Arthritis and low blood pressure
11. Pingul-bato	Leaves	Apply heated leaves on the affected area	White spots, pimples
12. Tanglad	Leaves, roots	Drinkable decoction	Pregnancy-related complications, headaches, low blood pressure, and colds

Apo Cornelio (Cultural Master):

"*Malaking pakinabang sa amin ang mga halaman na 'yan dahil bukod sa pagkain ay ginagamit din namin itong gamot sa mga sakit na aming nararamdaman, lalo na kung wala kaming pambili ng modernong gamot."*

(These plants are very useful to us because, in addition to being food, we also use them as medicine, especially if we don't have enough money to buy modern medicine.)

SLT student 4:

"'Pag masakit ang ulo ko, pinapainom ako ni ina ng sabaw ng nilagang dahon ng tibig. Ayun, nawawala ang sakit ng ulo ko."

(My mother would boil tibig leaves for me to drink when I get headaches, and it does the trick.)

Table 3 shows the 15 traditional dishes that use IFPs, as recorded and taught by the Cultural Masters. Some IFPs are fruits that can be eaten raw, such as bignay, bitungol, alupag, datiles, and tibig. Tibig fruits are tasteless and usually eaten with sugar, and their leaves can be eaten as vegetables. Antipolo's young fruit can be cooked as a vegetable, and the leaves of tukod langit (young leaves) and dampalit can be eaten as a salad.

Table 3: Different Traditional Dishes of the Aeta Magbukon Using IFPs

Name of Dish	Name of Plants and Parts Used
1. Bulanglang na babayan	Babayan leaves/flower
2. Inlagang tugi at ubi	Tugi and ubi
3. Hipong ulang	Binucao leaves
4. Ilung (salad)	Dampalit leaves
5. Imbuu ang gagang	Pingol-bato leaves, pakong ula, and freshwater crab
6. Imbuu lima- lima	Lima-lima roots (matured)
7. Imbuu hira	Binucao leaves cooked with any meat
8. Inlaga in aluloy	Aluloy fruit (fresh and green)
9. Inluto in gata	Antipolo fruits (young)
10. Nilurok	Takipan, limuran, palasan, and ditaan shoots
11. Inlaga in tibig, tukod langit, at pakong ula	Tibig, tukod langit, and pakong ula
12. Patbu	Rice, buho culm, and hagikik leaves
13. Patugong	Rice and buho culm
14. Tinanglarang suso	Tanglag/lemongrass
15. Tinuktuk	Takipan, malauban, limuran and ditaan shoots

The traditional dishes are usually cooked in Bataan Natural Park, where the Aeta Magbukon would source their natural ingredients. Bataan National Park is a protected area of the Philippines located in the mountainous interior of the Bataan Province in the Central Luzon Region. The park straddles the northern half of the Bataan Peninsula near its border at the Subic Bay Freeport Zone in Zambales. It was first established in 1945 under Proclamation No. 24, having an initial area of 31,000 hectares and portions reaching Subic, Zambales. The park area was reduced in 1987 to 23,688 hectares (58,530 acres) and is now wholly located in the Bataan Province. Today, the park encompasses the Bataan towns and cities of Hermosa, Orani, Samal, Abucay, Balanga, Bagac, and Morong (Official Gazette, 1945).

Figure 2 depicts the Cultural Master and students from the School of Living Traditions during one of the sessions on traditional dishes prepared with Indigenous food plants.

Figure 2: Traditional Dishes Made with Indigenous Food Plants are Taught to School of Living Traditions Students by Cultural Masters and Tribal Chieftains.

Under the Cultural Masters' guidance, participants forage as many traditional ingredients as they can, such as binucao, pakong ula, ayumit, and matang ulang. They also collected pingul bato for the imbuu hira, and bayngal leaves for the plate. SLT participants consider the nilurok dish with limuran, palasan, and ditaan, as well as the patbu and imbuu dishes with different indigenous root crops, including ube, tugi, and lima-lima, as their favorite delicacies.

Figure 3 illustrates two Aeta Magbukon SLT students with collected pingul-bato (a) and bayngal leaves (b) used as plates while eating in the forest.

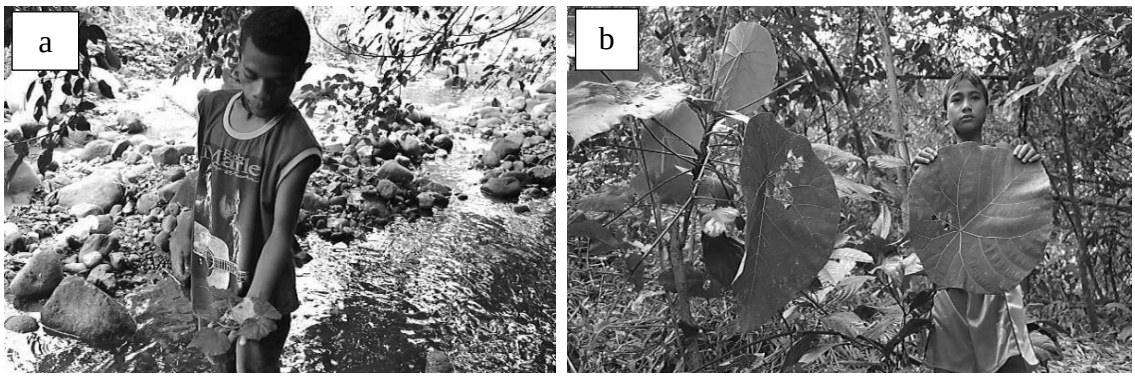

Figure 3: (a) A Participant Shows the Pingul-Bato He Collected. (b) Another Participant shows the Bayngal Leaves the Aeta Magbukon Use as Plates When Eating in The Forest

Sample Recipe of Aeta Magbukon Traditional Dishes Using IFPs

Tinuktuk

Ingredients

Limuran shoots
Ditaan shoots
Malauban shoots
Takipan shoots

Steps

1. Newly gathered shoots of limuran, malauban, takipan, and ditaan were cleaned. Their spines and leaf sheaths were removed until one layer of the leaf sheath is left to protect the shoot tissue from being exposed to the fire.
2. An opening in the center from both ends of the shoot is created using a bolo.
3. The shoots are directly placed on a fire for a few minutes.
4. The shoots are left to cool. Afterward, the burned layers of the shoot are removed.
5. The tip of each shoot is separated from the basal portion.
6. The basal portion of the shoots is sliced into smaller pieces measuring about 2–3 inches.
7. The soft tip is mixed with the basal portion of the shoot, and it is ready to serve.
8. The shoot can be dipped in salt or anchovies to taste.

The SLTs provided a venue for the Cultural Masters to appropriately teach and demonstrate their knowledge to the younger generation. Cultural Masters presented to the Aeta Magbukon students all the IFPs listed in Table 1 together with knowledge on how to collect IFPs in the forest, what part of the plants can be consumed, and how each plant is cooked. Furthermore, the learning modules on IFPs are part of the Terminal Reports submitted to the NCCA for documentation and archiving. A copy of each report was given to the Aeta Magbukon tribe, and the researcher was able to apply the ISBN for two of the printed reports, one audio recording, and one video recording.

(1) Ayta Magbukon School of Living Traditions: Preparatory Phase with ISBN 978-971-9956-33-4;
(2) Bataan Ayta Magbukon Radio Program: Sa Kabukilan with ISBN 978-971-9956-39-6 (Audio); and
(3) Bangkal, Abucay, Bataan SLT on Traditional Songs, Dances, Indigenous Knowledge of Ayta Phase 1 with ISBN 978-971-9956-31-0 for the printed report and ISBN 978-9956-38-9 for the video documentation.

Participants collected IFPs to plant them in a nursery in the village where the Aeta Magbukon live (Figure 4). The space was intended for the Aeta Magbukon children excluded from the study. Through the nursery, the children will be able to identify IFPs, understand their use, and be further motivated to protect them. Having been introduced to IFPs in the village and with the help of the SLT students and Cultural Masters, children can easily identify and collect the plants when foraging in the mountains.

Figure 4: Participants from Aeta Magbukon Learn about Indigenous Food Plants in the Nursery.

The idea of establishing an IFP nursery came from the Cultural Masters and elders. It aims to provide the Aeta youths interested in learning about IFPs with a reference that is more easily accessed than the mountainous terrain.

Apo Ruben (Culturala Master):

"*Mahalagang makilala na nila ang mga halaman na ito, dito pa lang sa barrio. Kadalasan kasi, hindi nila ito madaling makita sa gubat. Gusto rin naming makita ito ng ibang hindi katutubo para maiwasan ang hindi sinasadya o sinasadyang pagputol nito sa gubat."*

(It's vital that they learn about these plants here in the barrio. Often, they have a hard time identifying these in the forest. We also want nonindigenous people to see this nursery to keep them from accidentally or intentionally cutting IFPs in the forest.)

The researcher also observed several nonparticipants joining the teaching sessions conducted by the Cultural Masters. Such students were just as interested, if not more, in learning about IFPs and traditional cooking. These nonparticipants picked up the skills presented through the SLTs and were incidentally included in the extension part of the program.

An activity included in the SLT programs is for the students to demonstrate what they have learned about their culture to nonindigenous people (Figure 5). These demonstrations were held at the BPSU Abucay Campus. Surprisingly, the audience liked the dishes that the SLT students cooked using IFPs, confirming David's (2011) conclusions about the social acceptability of the Aeta Magbukon IFPs as alternative food sources. In particular, the demonstrations proved that, based on the different attributes of color, flavor, aroma, and texture, the 10 IFPs presented in David's study were all acceptable. Furthermore, the 10 IFPs included in the research were the same IFPs that the SLT students cooked during the demonstration.

Figure 5: During the Demonstration, the Cultural Masters and Students from the School of Living Traditions Were Joined by Several Non-Aetas Who Were Interested in Learning about Indigenous Food Plants.

Audience members about IFP dishes:

"Masarap din po, at parang wala naming pinag kaiba sa ibang gulay. Nagustuhan namin ang mga niluto nila, lalo na 'yung putahe ng apat na klase ng rattan. 'Di namin akalain na puwede rin pala siyang pagkain bukod sa ginagawa itong furniture."

(It is also delicious and tastes no different than other vegetables. We appreciate what they cooked, especially the dishes made from the four rattan varieties. We didn't expect it to be used as food, not just for making furniture.)

Some of the identified IFPs already have recorded nutrient values, as evidenced by the work of several researchers and agencies (Kalita et al., 2014; Centre for Indigenous Peoples' Nutrition and Environment, 2020; Islary et al., 2017; Estacio et al., 2020; Assous et al., 2013). However, this data was not included in the analysis done on the information provided by the Cultural Masters and elders. Likewise, IFPs' effectiveness as a medicinal remedy was not included in this study. These will be integrated into subsequent studies and programs about the culture of the Aeta Magbukon.

6. CONCLUSION AND RECOMMENDATION

The IK of the Aeta Magbukon, the focus of this study, is their knowledge of IFPs and their uses. Although most of the younger generation lack knowledge about IFPs, the Cultural Masters and elders believe that many

Aetas will remain eager to learn about their environment and all the plant species therein because it is already in their very nature and existence.

The Aeta Magbukon Cultural Masters and elders believe that they eat to survive and will take whatever is available in their surroundings. According to them, this mentality enables them to survive during difficult times. The knowledge and consumption of IFPs is part of the Aeta's way of life, and to them, these practices symbolize satiation and salvation.

The future dietary needs of the Aeta Magbukon are determined by their population growth and poverty. Continued association with nonindigenous people nurtures a sense of belongingness to nonindigenous cultural practices, including acquiring or purchasing foods readily available in the market. Nonetheless, the IP's knowledge of IFPs allows them to adapt to unfavorable economic situations, where they are unable to purchase food from the market.

Moreover, the consumption of IFPs should be encouraged among IPs to feed their growing population, as this is a part of their IK that is being neglected. This will have a considerable impact on alleviating food insecurity and hunger and preserving cultural heritage. The NCCA has provided immense help in launching SLTs. As a result, various IPs in the Philippines have the opportunity to revive their IK, especially their expertise in the IFPs.

Intrusions on ancestral land by non-Aeta Magbukon groups still continue at present. Therefore, the local government should promulgate policies and ordinances to protect IFPs and include the conservation and protection initiatives that allow the habitats of endemic and rare plant species to thrive. Moreover, the exploitation of the natural resources used by IPs can be prevented through comprehensive information and educational campaigns that underscore the potential and worth of these natural resources. Enhancing cultural management practices for increased productivity should also be considered. Finally, the important role of IFPs in environmental protection is worth highlighting through educational activities.

Further investigation on the nutritional value and health benefits of IFPs is also recommended. The academe and research and development institutions should undertake analyses on the nutritional components of IFPs and innovate new recipes using them. Ultimately, the findings of the study should be disseminated through publications and extension workers.

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REFERENCES

Aeta Tribes Foundation. (2017). *The Aeta Tribes.* [Online URL: https://www.aetatribes.org/] accessed on November 13, 2020.

Africa Research Online. (2015). *Africa Indigenous Crops and Food Security.* [Online URL: https://africaresearchonline.wordpress.com/2015/06/16/africa-indigenous-crops-and-foodsecurity/] accessed on November 3, 2019.

Agea, J., Lugangwa E., Obua, J. and Kambugu R. (2008). Role of indigenous knowledge in enhancing household food security: a case study of Muukungwe, Masaka District, Central Uganda*. Indilinga: African Journal of Indigenous Knowledge Systems* 7(1): 64-71. [Online URL: https://www.ajol.info/index.php/indilinga/ article/view/26394] accessed on November 4, 2019.

Alegado, A. and De Guzman, R. (2014). Indigenous Food Crops of the Aetas Tribe in the Philippines and their Traditional Methods of Food Preparation*.* In *Promotion of Underutilized Indigenous Food Resources for Food Security and Nutrition in Asia and the Pacific*, edited by P. Durst and N. Bayasgalanbat, pp. 160-167. Bangkok: Rap Publication. [Online URL: https://www.fao.org/3/i3685e/i3685e.pdf] accessed on November 4, 2019.

Amoah, D. O. (n.d.). *A Review on the Medicinal Plant, Ficus Minahassae (Hagimit) Linn. (Moraceae).* [Online URL: https://www.academia.edu/27921140/A_REVIEW_ON_THE_MEDICINAL_PLANT_FICUS_MINAHASSAE_HAGIMIT_LINN_MORACEAE] accessed on March 31, 2021.

Angeles-Agdeppa, I. (2009). Food and nutrition security and poverty alleviation in the Philippines. *Asia Pacific Journal of Clinical Nutrition* 11(1). S335-S340 [Online URL: https://doi.org/10.1046/j.1440-6047.11.s13.1_11_s1.x] accessed on October 13, 2019.

Antonio, M., Utrera, R., Agustin, E., Jamias, D., Badar, A. and Pascua, M. (2010). Indigenous food plants (IFPs) for increased food sufficiency in Ilocos Norte, Philippines. *Policy Brief Series* 2010(3): 1-2.

Arnason, T., Hebda R. J. and Johns T. (1981). Use of plants for food and medicine by native peoples of eastern Canada. *Canadian Journal of Botany* 59(11): 2189-2325.

Assous, M., El-Waseif, M. and Gado, G. (2013). Production and evaluation of nontraditional products from lemon grass. *Egypt Journal of Agricultural Research* 91(1): 271-283.

Balila, V., Mc Henry J., Riva M., Mark P. and Banal D. (2013). Indigenous Aeta Magbukún self-identity, social political structures, and self-determination at the local level in the Philippines. *Journal of Anthropology* 2013:1-6.

Banaag, A., Honda, H. and Shono, T. (1997). Effects of alkaloids from yam, Dioscorea hispida Schlussel, on feeding and development of larvae of the diamondback moth, Plutella xylostella (Lepidoptera: Yponomeutidae). *Applied Entomology and Zoology* 32(1):119-126.

Battista, A. (2019). *5 Reasons Why We Should Teach the Value of Cultural Heritage to High School Students.* [Online URL: https://culturalheritagethroughimage.omeka.net/5-reasons-why-we-should-teach-the-value-of-cultural-heritage-to-high-school-students] accessed on November 11, 2020.

Berkelaar, D. (2011). *The Importance of Indigenous Food Plants.* [Online URL: https://www.echocommunity.org/resources/a118dadf-50d6-492c-a19f-948a23c93e83] accessed on November 9, 2019.

Bernadas, Jr., C. and Peralta, M. (2017). Indigenous crops and wild plants used as food by the Pala'wan tribe in Southern Palawan, Philippines. *Journal of Nature Studies* 16(1): 11-17.

Calderon, M., Bantayan, N., Pulhin, F., Cruz, L. (2015). Potential of a forestry carbon project for the Magbukun Ayta of Bataan, Philippines. *Ecosystems & Development Journal* 5 (3):12-22. [Online URL: https://ovcre.uplb.edu.ph/journals-uplb/index.php/EDJ/article/view/215/200] accessed on November 2, 2021.

Cámara-Leret, R., Fortuna, M. and Bascompte, J. (2019). Indigenous knowledge networks in the face of global change. *PNAS* 116(20): 9913-9918.

Cariño, J. (2009). Introduction: Promoting Indigenous Knowledge for Food Security. In *Promoting Indigenous Knowledge for Food Security: A Source Book*. edited by AL. Tamayo and M. Demetillo, pp. 1-4. Quezon City: EED Philippine Partners Task Force for Indigenous Peoples Rights (EED-TFIP).

Cassio, L. (2020). *Food Security in the Face of the Covid-19 Pandemic.* [Online URL: https://www.latinamerica.undp.org/content/rblac/en/home/blog/2020/la-seguridad-alimentaria-frente-a-la-pandemia-del-covid-19.html] accessed on October 11, 2020.

Centre for Indigenous Peoples' Nutrition and Environment. (2020). *Asian Case Study: The Aetas of Morong.* Macdonald Campus: McGill University.

Cidro, J., Adekunle, B., Peters, E. and Martens, T. (2015). Beyond food security: understanding access to cultural food for urban indigenous people in Winnipeg as indigenous food sovereignty. *Canadian Journal of Urban Research* 24(1): 24-43.

Commission on Higher Education. (2019). *CHED Memorandum Order no. 2 s. 2019. Integration of Indigenous Peoples (I.P.) Studies/Education into the Relevant Higher Education Curricula*. [Online URL: https://ched.gov.ph/wp-content/uploads/CMO-No.-02-Integration-of-Indigenous-peoples-studies-into-the-relevant-Higher-Education-Curricula.pdf] accessed on November 20, 2020.

Cordeiro, L. (2013). *The Role of African Indigenous Plants in Promoting Food Security and Health.* [Online URL: https://www.researchgate.net/publication/286427310_The_Role_of_African_Indigenous_Plants_in_Promoting_Food_Security_and_Health] accessed on September 5, 2019.

Creswell, J. W. (2003). *Research Design: Qualitative, Quantitative, and Mixed Methods Approach.* 2nd ed. Thousand Oaks: Sage.

Creswell, J. W. and Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into Practice* 39(3): 124-130.

Dass, A., Sudhishri, S., Lenka, N. and Patnaik, U. (2011). Runoff capture through vegetative barriers and planting methodologies to reduce erosion, and improve soil moisture, fertility and crop productivity in southern Orissa, India. *Nutrient Cycling in Agroecosystems* 89: 45-57.

David, N. (2011). Social acceptability of Ayta Magbukon indigenous food plants (IFPs) as alternative food sources. *Journal of Nature Studies* 10(2): 53-60.

David, N. (2013). Preservation of indigenous culture of Bataan through an Ayta Magbukon school of living tradition (SLT) program. *IAMURE International Journal of Social Sciences* 7(1): 1-10.

Department of Education (DepEd). (2011). *DO 62. Adopting the National Indigenous Peoples (IP) Education Policy Framework.* [Online URL: https://www.deped.gov.ph/wp-content/uploads/2011/08/DO-No.-62-s.-2011.pdf] accessed on November 13, 2020.

DepEd. (2015). *DO 32. Adopting the Indigenous Peoples Education Curriculum Framework.* [Online URL: https://www.deped.gov.ph/wp-content/uploads/2015/07/DO_s2015_32.pdf] accessed on November 13, 2020.

DepEd. (2016). *Implementing Guidelines on the Allocation and Utilization of the Indigenous Peoples Education (IPEd) Program Support Fund for Fiscal Year (FY) 2016.* [Online URL: https://www.deped.gov.ph/wp-content/uploads/2016/04/DO_s2016_22.pdf] accessed on November 13, 2020.

DepEd. (2017). *The Roles and Responsibilities of the Regional and Division IPEd Focal Persons at the Regional and Schools Divisions Levels*. [Online URL: https://www.deped.gov.ph/wp-content/uploads/2017/07/DO_s2017_033-1.pdf] accessed on November 13, 2020.

Díaz-José, J., Guevara-Hernández, F., Morales-Ríos, V. and López-Ayala, JL. (2019). Traditional knowledge of edible wild plants used by indigenous communities in Zongolica, Mexico. *Ecology of Food and Nutrition* 58(5): 511-526.

Estacio, M., Atienza, L., Gapasin, R., Maniwang, J. R., Aranzado, J. R., Mercado, C. J., Dela Cruz, M. A., Fernandez, N. D., Sunico, D. J., Israel, K. A., Ilagan, J. and Bainto, L. (2020). Acute oral toxicity test of selected Philippine indigenous berries as potential food supplements. *Current Developments in Nutrition* 4(2): 684.

FAO (Food and Agriculture Organization of the United Nations). (2009). *FAO and Traditional Knowledge: The Linkages with Sustainability, Food Security and Climate Change Impacts.* [Online URL: http://www.fao.org/3/a-i0841e.pdf] accessed on October 10, 2020.

FAO. (2013). *Indigenous Peoples' Food Systems and Well-Being Interventions and Policies for Healthy Communities.* [Online URL: http://www.fao.org/policy-support/tools-and-publications/resources-details/en/c/471102/] accessed on October 29, 2019.

FAO. (2020). *Ensuring Indigenous Peoples' Right to Food is Paramount in the Fight against COVID-19.* [Online URL: http://www.fao.org/right-to-food/news/news-detail/en/c/1301716/] accessed on October 11, 2020.

FAO, International Fund for Agricultural Development, United Nations Children's Fund, and World Food Programme, World Health Organization. (2019). *The State of Food Security and Nutrition in the World 2019. Safeguarding against Economic Slowdowns and Downturns*. [Online URL: http://www.fao.org/3/ca5162en/ca5162en.pdf] accessed on October 23, 2020.

FAO World Food Summit. (1996). *Rome Declaration on World Food Security.* [Online URL: https://www.fao.org/3/w3613e/w3613e00.htm] accessed on October 20, 2021.

Food and Agriculture Organization of the United Nations Centre for Indigenous Peoples' Nutrition and Environment (2013). Indigenous Peoples' Food Systems and Well-Being: Intervention and Policies for Healthy Communities. Rome: United Nations Food and Agriculture Organization. [Online URL: https://www.fao.org/3/i3144e/i3144e.pdf] accessed on November 5, 2019.

Global Report on Food Crises. (2020). *Global Report on Food Crises: Joint Analysis for Better Decisions.* [Online URL: https://docs.wfp.org/api/documents/WFP-0000114546/download/?] accessed on November 11, 2020.

Gonzaga, R. (2012). *Eternal Vigilance Key to Save Bataan Forest from Logging. Inquirer Northern Luzon. Inquirer.Net*. [Online URL: https://newsinfo.inquirer.net/141481/eternal-vigilance-key-to-save-bataan-forest-from-logging] accessed on November 11, 2019.

Hanazaki N., Zank S., Fonseca-Kruel V. and Schmidt I. B. (2018). Indigenous and traditional knowledge, sustainable harvest, and the long road ahead to reach the 2020 Global Strategy for Plant Conservation objectives. *Rodriguésia* 69(4): 1587-1601. [Online URL: http://dx.doi.org/10.1590/2175-7860201869409] accessed on October 31, 2019.

Huet, C., Rosol, R. and Egeland, G. (2012). The prevalence of food insecurity is high and the diet quality poor in Inuit communities. *The Journal of Nutrition* 142(3): 541–547.

International Labour Organization. (2019*). International Day of the World's Indigenous Peoples 2019.* [Online URL: https://www.ilo.org/global/meetings-and-events/events/WCMS_714918/lang--en/index.htm] accessed on November 13, 2019.

International Work Group for Indigenous Affairs. (2019). *Indigenous Peoples in Philippines.* [Online URL: https://www.iwgia.org/en/philippines] accessed on November 10, 2019.

Islary, A., Sarmah, J. and Basumatary, S. (2017). Nutritional value, phytochemicals and antioxidant properties of two wild edible fruits (*Eugenia operculata* Roxb. and *Antidesma bunius* L.) from Assam, North-East India. *Mediterranean Journal of Nutrition and Metabolism* 10(1): 29-40.

Janke, T. (2018). From smokebush to spinifex: towards recognition of indigenous knowledge in the commercialisation of plants. *International Journal of Rural Law and Policy* 2018(1):1-37.

Kalita, P., Tag, H., Sarma, H. N. and Das, A. (2014). Evaluation of nutritional potential of five unexplored wild edible food plants from Eastern Himalayan biodiversity hotspot region (India). Paper presented at the *ICFAE 2014: International Conference on Food and Agricultural Engineering.* Miami, United States. March 10-11. [Online URL: https://publications.waset.org/9997658/evaluation-of-nutritional-potential-of-five-unexplored-wild-edible-food-plants-fromeastern-himalayan-biodiversity-hotspot-region-india] accessed on December 20, 2020.

Kamwendo, G. and Kamwendo, J. (2014). Indigenous knowledge-systems and food security: some examples from Malawi. *Journal of Human Ecology* 48(1): 97-101.

Lanting, M. V. Jr. and Palaypayon, C. M. (2002). *Forest Tree Species with Medicinal Uses.* Laguna: Ecosystems Research and Development Bureau.

Lasco, G. (2013). *Mountain News: Illegal logging in Pantingan Peak, Mt. Mariveles, Bataan. Pinoy Mountaineer*. [Online URL: http://www.pinoymountaineer.com/2013/05/mountain-news-illegal-logging-in.html] accessed on October 19, 2021.

Law, L., Norhasmah, S., Gan, W., Siti Nur'Asyura, A. and Mohd Nasir, M. (2018). The identification of the factors related to household food insecurity among indigenous people (Orang Asli) in Peninsular Malaysia under traditional food systems. *Nutrients* 10, 1455. [Online URL: https://doi.org/10.3390/nu1010 1455] accessed on November 2, 2021.

Lecompte, E., McKinnon, J. and Kristjasson, E. (n.d.). *Food Insecurity in Aboriginal Urban Households*. [Online URL: https://foodsecurecanada.org/sites/foodsecurecanada.org/files/Aboriginal_food_insecurity_report1.pdf] accessed on November 16, 2019.

Lemke, S. and Delormier, T. (2017). Indigenous Peoples' Food System, Nutrition, and Gender: Conceptual and methodological considerations. *Maternal & Child Nutrition* 13(S3): e12499. [Online URL: https://onlinelibrary.wiley.com/doi/10.1111/mcn.12499] accessed on November 21, 2019.

Lisdiana, L. and Yuliani. (2015). *Local wisdom in the making of plants based biopesticides by organic rice farmers in East Java*. In K. Muzakhar, Purwatiningsih, E. T. Utami, Siswoyo, F. B. Ulum, R. Setiawan, S. Ubaidillah, A. Barokah, Z. Khoiriyah and J. Arminatul, International Conference on Life Sciences and Biotechnology. Exploration and Conservation of Biodiversity. pp. 152-167. Jember: University of Jember.

Lugo-Morin, D. (2020*).* Indigenous communities and their food systems: a contribution to the current debate. *Journal of Ethnic Foods* 7(6): 1-10.

Mbhenyane, X. (2017). Indigenous foods and their contribution to nutrient requirements. *South African Journal of Clinical Nutrition* 30(4): 5-7**.**

Mbhenyane, X., Mushaphi L., Mabapa, N., Makuse, S., Nemathaga, L. and Lebese, R. (2013). The consumption of indigenous fruits and vegetables and health risk in rural subjects of Limpopo province, South Africa*. Indilinga: African Journal of Indigenous Knowledge Systems* 12(1): 160-168. [Online URL: https://www.researchgate.net/profile/Hlekani-Mbhatsani/publication/279062202_Knowledge_and_consumption_of_indigenous_food_by_primary_school_children_in_Vhembe_District_in_Limpopo_Province/links/58e73d404585152528de5ceb/Knowledge-and-consumption-of-indigenous-food-by-primary-school-children-in-Vhembe-District-in-Limpopo-Province.pdf] accessed on November 11, 2019.

Mhache, E. P. (2018). The contribution of indigenous knowledge systems (IKS) on food security in Mbokomu ward, Kilimanjaro region, Tanzania. *African Journal of Environmental Science and Technology* 12(3): 96-105.

Msuya, T. S., Kideghesho, J. and Mosha Theobald C. (2010). Availability, preference, and consumption of indigenous forest foods in the eastern ARC mountains, Tanzania. *Ecology of Food and Nutrition* 49(3): 208-227.

Mwango, S., Msanya, B., Mtakwa, P., Kimaro, D., Deckers, J., Poesen, J., Massawe, V. and Bethuel I. (2014). Root properties of plants used for soil erosion control in the Usambara mountains, Tanzania. *International Journal of Plant & Soil Science* 3(12): 1567-1580.

National Commission for Culture and the Arts (NCCA). (2019). *School of Living Traditions Guidelines: Under the NCCA's program for the Conservation of Cultural Heritage – Preservation and Protection Heritage.* [Online URL: https://ncca.gov.ph/wp-content/uploads/2015/09/2014-464-Schools-of-Living-Traditions-program-Guidelines_opt.pdf] accessed on November 9, 2019.

National Commission on Indigenous People (NCIP). (1998). *Administrative Order No. 1 Series of 1998. Rules and Regulations Implementing Republic Act No. 8371, Otherwise Known as "Indigenous People's Rights Act of 1997"*. [Online URL: https://www.officialgazette.gov.ph/1997/10/29/republic-act-no-8371/] accessed on November 11, 2019.

National Commission on Indigenous Peoples. (2020). *Ayta Magbukun*. [Online URL: https://ncip.gov.ph/ayta-magbukun/] accessed on October 20, 2021.

National Committees for Research Ethics in Norway. (2006). *Guidelines for Research Ethics in the Social Sciences, Law and the Humanities.* [Online URL: https://graduateschool.nd.edu/assets/21765/guidelinesresearchethicsinthesocialscienceslawhumanities.pdf] accessed on September 1, 2019.

Native Voices. (2019). *Native People's Concepts of Health and Illness. Medicine Ways: Traditional Healers and Healing.* [Online URL: https://www.nlm.nih.gov/nativevoices/exhibition/healing-ways/medicine-ways/healing-plants.html] accessed on November 12, 2019.

Neyra, E. (2009). The Tiduray of Upi: Promoting Indigenous Knowledge for Food Security. In *Promoting Indigenous Knowledge for Food Security. A Sourcebook.* edited by AL. Tamayo and M. Demetillo, pp. 40-54. Quezon: EED Philippine Partners'Task Force for Indigenous Peoples' Rights.

Official Gazette. (1945). *Proclamation No. 24. Series No. 45*. [Online URL: https://www.officialgazette.gov.ph/1945/12/01/proclamation-no-24-s-1945/] accessed on November 18, 2021.

Ogundiran, A. (2019). Food security, food sovereignty, and indigenous knowledge. *African Archaeological Review* 36: 343-346.

Ohiokpehai, O. (2003). Promoting the nutritional goodness of traditional food products. *Pakistan Journal of Nutrition* 2(4): 267-270. [Online URL: http://www.docsdrive.com/pdfs/ansinet/pjn/2003/267-270.pdf] accessed on November 10, 2019.

Ong, H. and Kim, Y.-D. (2017). The role of wild edible plants in household food security among transitioning hunter-gatherers: evidence from the Philippines. *Food Security* 9(1): 11-24.

Orticio, G. C. (2007). *Taking Culture Seriously: The Case of Indigenous Knowledge and Food Security.* [Online URL: https://eprints.qut.edu.au/63689/] accessed on November 10, 2020.

Pérez-Escamilla, R. (2017). Food security and the 2015-2030 sustainable development goals: from human to planetary health: perspectives and opinions. *Current Developments in Nutrition* 1(7) :e000513. [Online URL: https://academic.oup.com/cdn/article/1/7/e000513/4259862?login=true] accessed on October 20, 2021.

Pichop, G., Abukutsa-Onyango, M., Noorani, A. and Nono-Womdim, R. (2016). Importance of indigenous food crops in tropical Africa: case study. *Acta Horticulturae* 1128: 315-322.

Poudel, D., Midmore, D. and West L. (2000). Farmer participatory research to minimize soil erosion on Steepland vegetable systems in the Philippines. *Agriculture, Ecosystems & Environment* 79(2-3): 113-127.

Punchay, K., Inta, A., Tiansawat, P., Balslev, H. and Wangpakapattanawong, P. (2020). Traditional knowledge of wild food plants of Thai Karen and Lawa (Thailand). *Genetic Resources and Crop Evolution* 67: 1277-1299. [Online URL: https://www.researchgate.net/publication/339510790_Traditional_knowledge_of_wild_food_ plants_of_Thai_Karen_and_Lawa_Thailand] accessed on November 20, 2020.

Punongbayan, M. (2011). *Bataan Mayor Probed on Illegal Logging.* Phil Star Global. [Online URL: https://www.philstar.com/nation/2011/01/10/646329/bataan-mayor-probed-illegal-logging] accessed on November 11, 2019.

Sapnu, R. (2011). *7 Illegal Loggers Arrested in Bataan.* Phil Star Global. [Online URL: https://www.philstar.com/nation/2011/07/04/702044/7-illegal-loggers-arrested-bataan] accessed on October 20, 2021.

Sari, D., Fitrawati, and Bahtiar. (2020). Effect of Dioscorea hispida dennst. against Rattus sp. Paper presented at *the IOP Conference Series: Earth and Environmental Science 484*. Makassar City. September 23-25, 2019. [Online URL: https://iopscience.iop.org/article/10.1088/1755-1315/484/1/012109/pdf] accessed on December 23, 2020.

Saxena, H. O., Tripathi, Y. C., Pawar, G., Kakkar, A. and Mohammad, N. (2014). Botanicals as biopesticides: Active Chemical Constituents and Biocidal Action. In *Familiarizing with Local Biodiversity. Notes on Systematics of Plants and Insects*. edited by P. K. Khatri and P. B. Meshram, pp. 219-240. Jabalpur: Tropical Forest Research Institute.

Shava, S. (2000). *The Use of Indigenous Plants as Food by a Rural Community in the Eastern Cape: An Educational Exploration.* Master's Thesis. Rhodes University: South Africa.

Shava, S. (2005). Research on indigenous knowledge and its application: a case of wild food plants of Zimbabwe. *Southern African Journal of Environmental Education* 22(1): 73-86.

Sibol ng Agham at Teknolohiya. (2009). Preserving Indigenous Grains: The Collective Knowledge of B'laan in Upland Agriculture. In *Promoting Indigenous Knowledge for Food Security. A Sourcebook*, edited by AL.

Tamayo and M. Demetillo, pp. 21-30. Quezon: EED Philippine Partners'Task Force for Indigenous Peoples' Rights.

Siytangco, A. (2018). *Logging Blamed for Flooding in Bataan; Balanga Rescues Victims. Manila Bulletin*. [Online URL: https://mb.com.ph/2018/08/09/logging-blamed-for-flooding-in-bataan-balanga-rescues-victims/] accessed on November 10, 2019.

Skinner, K., Pratley, E. and Burnett, K. (2016). Eating in the city: a review of the literature on food insecurity and indigenous people living in urban spaces. *Societies* 6(2): 7. [Online URL: https://www.mdpi.com/2075-4698/6/2/7/htm] accessed on November 4, 2019.

Stuart, Jr. G. U. (2018). *Tibig.* [Online URL: http://www.stuartxchange.org/Tibig.html] accessed March 30, 2021.

Sunstar. (2019). *Editorial: Food Security in our Communities.* [Online URL: https://www.sunstar.com.ph/article/1818374] accessed on November 16, 2019.

Tantengco, O. A. G., Condes, M. L. C., Estadilla, H. H. T. and Ragragrio, E. M. (2018). Ethnobotanical survey of medicinal plants used by Ayta communities in Dinalupihan. *Pharmacognosy Journal* 10(5): 859-870.

Technical Report. (2004). *Application of Production and Utilization Technologies for Rattan Sustainable Development in the ASEAN Member Countries.* Laguna: Department of Environment and Natural Resources (ERDB-DENR).

Temple, J. B. and Russell, J. (2018). Food insecurity among older aboriginal and torres strait islanders. *International Journal of Environmental Research and Public Health* 15(8): 1766.

Termote, C., Van Damme, P. and Dhed' a Djailo B. (2010). Eating from the wild: Turumbu indigenous knowledge on edible plants, Tshopo District, DRCongo. *Ecology of Food and Nutrition* 4(93): 173-207. [Online URL: https://www.ncbi.nlm.nih.gov/pubmed/21883079] accessed on November 2, 2019.

Torres-Vitolas, C., Harvey, C., Cruz-Garcia, G., Vanegas-Cubillos, M. and Schreckenberg, K. (2019). The socio-ecological dynamics of food insecurity among subsistence-oriented indigenous communities in Amazonia: a qualitative examination of coping strategies among riverine communities along the Caquetá River, Colombia*. Human Ecology* 47, 355-368 [Online URL: https://doi.org/10.1007/s10745-019-0074-7.] accessed on November 2, 2021.

Trizelia, T., Rahma, H. and Martinius, M. (2017). Potential of endophytic fungi from chilli as bioinsecticides against *Tenebrio Molitor* Lin. and *Spodoptera litura* Fab. larvae. *Journal of Biopesticides* 10(1): 10-16.

Tshering, K., Thapa, L., Matsushima, K., Minami, M. and Nemoto, K. (2014). Edible Wild Plants of Bhutan and Their Contribution to Food and Nutrition Security. In *Promotion of Underutilized Indigenous Food Resources for Food Security and Nutrition in Asia and the Pacific*, edited by P. Durst and N. Bayasgalanbat, pp. 60-69. Bangkok: RAP Publication.

UN-DESA. (2020). *End Hunger, Achieve Food Security and Improved Nutrition, and Promote Sustainable Agriculture.* [Online URL: https://sdgs.un.org/goals/goal2] accessed on October 12, 2020.

UNESCO. (2017). *Local and Indigenous Knowledge Systems (LINKS).* [Online URL: https://en.unesco.org/links] accessed on November 13, 2020.

UNESCO. (2019). *Indigenous Peoples.* [Online URL: https://en.unesco.org/indigenous-peoples] accessed on November 11, 2019.

United Nations. (2003). *Importance of Indigenous Education and Culture Highlighted, as Permanent Forum, Continues Second Session.* [Online URL: https://www.un.org/press/en/2003/hr4674.doc.htm] accessed on November 11, 2020.

Van der Merwe, J., Cloete, P. and van der Hoeven, M. (2016). Promoting food through indigenous and traditional food crops. *Agroecology and Sustainable Food Systems* 40(8): 830-847.

Yu, G. F. B. (2007). *Phytochemicals and Nutrient Composition of Rattan Limuran (Calamus Ornatus Blume) Shoot Consumed By Kanawan Aytas in Morong, Bataan, Philippines.* Los Banos: Philippines University.