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Environmental Education and Preservation of Traditional Plant Knowledge in Suriname

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ABSTRACT

Tbilisi principles call for a holistic approach to environmental education that considers the culture and history of those seeking solutions to local issues. In developing nations, this culture and history often includes a link to traditional ethnobotanical knowledge (TEK). Knowledge of traditional phytotherapies remains crucial to the majority of the world's population but is disappearing from many cultures as development fragments both natural habitats and native communities. In areas desperate for income, the lure of modernization often results in cultural dissolution without the anticipated benefits of "progress." Studies suggest that respect for TEK can contribute to the conservation of biodiversity.

In the culturally and biologically diverse Amazonian country of Suriname, data were collected on the degree to which plant knowledge is being preserved, is being valued, and could best be transmitted to younger generations. Findings indicate that the elder generations and rural populations retain the most ethnobotanical information. While a majority believes little knowledge is being transferred, nearly all participants feel that TEK is important and belongs in school curricula. Recommendations are offered for effective plant education and local environmental issue analysis within an IEEIA framework.

INTRODUCTION

From scientific, humanitarian, and even conservationist perspectives, the maintenance of traditional ethnobotanical knowledge (TEK) remains a prominent concern. Its loss affects hopes

for pharmaceuticals, conservation of sensitive lands, and the welfare of the remaining indigenous cultures. In this study, we assessed the possibility of maintaining TEK through the public education system, drawing from the collected perceptions of educators, village elders, and a sample of the general population of coastal Suriname.

A broad and intricately detailed knowledge of local plants is "generally typical" of the estimated 200-500 million people who inhabit the world's tropical forests (Alcorn 1995). Many researchers have found, however, that these "traditional knowledge systems are rapidly fading away" (Cox 2000), and that there is a strong, positive correlation between age and ethnobotanical knowledge (Reyes-García, et al. 2005; Redford and Stearman 1993; Jackson 1995). New partnerships have been forming among ethnobotanists, the indigenous, and conservationists as TEK is seen as a complement to western science and as ethnobotany grows into an increasingly interdisciplinary, applied field (Alcorn 1995; Balick 1996; Berkes, Colding, and Folke 2000). The importance of TEK is also widely recognized by the international conservation community; the 1992 Convention on Biological Diversity holds its contracting parties to "respect, promote, and maintain traditional knowledge," as well as to "promote wide application of traditional knowledge" (Cox 2000), a trend founded, perhaps, in the growing consensus that TEK can aid in the conservation of biodiversity (Berkes, Colding, and Folke 2000).

One major strategy for conservation is to increase education in science, conservation, and/or the custom-framed specifics of the culture's traditional knowledge (Berkes, Colding, and Folke 2000; Karr and Thomas, 1996; Reyes-García, et al. 2005). The 1992 Convention on Biological Diversity also supports education on the conservation of biological diversity. Karr and Thomas (1996) also advocate environmental education as a means to improve environmental quality, and Reyes-García, et al. (2005) state their findings support using the educational system

to propagate folk knowledge, citing a positive correlation between years in school and degree of TEK.

Those working specifically in science education in indigenous cultures have also stated the need for and effectiveness of "relevant" science, specifically "cultural examples, perspectives, and fieldwork" (McKinley 2005). Reports of attempted collaborations with indigenous peoples to determine the content and method of science education are lacking (McKinley 2005), barring the exception of largely unsuccessful "shaman schools" (Jackson 1995).

Suriname, a diverse country situated between the Amazon and Orinoco rivers in northeastern South America, retains over 85% of its rainforest but is facing pressure from logging extractive industries. The population is concentrated on the coast, with Amerindian and bushnegroe tribes scattered through the interior. The Ministry of Education, with a singular national curriculum, cites the lack of relevance of the knowledge delivered by the schools as a major concern.

In studying 1) the perceived importance or relevance of TEK, 2) the variables associated with its loss, and 3) perceptions of the most efficacious means of maintaining this knowledge, this preliminary study sought to explore the possibility of collaboration in education to stave off the loss of traditional ethnobotanical knowledge.

METHOD

Participants (N=70) were chosen from three locations: Paramaribo (N=17), the Para and Wanica districts (N=30), and Niew Nickerie (N=23). Paramaribo is the capital city and the industrial center of the country. The Para/Wanica districts are more rural areas, and Niew Nickerie is more modernized than Para/Wanica but more remote from the capital. Paper surveys

and qualitative interviews were completed. The sample includes a diverse cross-section of Suriname's coastal region, but focused mainly on educators, student-teachers, and parents. The qualitative interviews were conducted primarily with local shaman and village elders and provided a context for any trends that developed in the quantitative analysis.

Degree of plant knowledge was estimated from the number of traditional plant treatments known for diarrhea, a pedestrian ailment in developing nations. Participants were considered to know a treatment only if they could identify the plant used and provide a description of its preparation and dosage. Additionally, questions were asked to determine the degree to which participants believe TEK is being passed to the youngest generation, to what degree the preservation of TEK is important, and in what ways they believe TEK would best be maintained in their culture.

RESULTS

Findings from the written surveys, interviews, and observations are presented here in an integrated manner. Open-ended questions, interviews, and observations help contextualize and frame the quantitative data analysis. Results addressing the main research questions are presented, followed by discussions of socio-cultural factors that are probable influences. Lastly, implications of the findings are discussed and recommendations for helping bridge the generational gap in TEK are offered.

In Which Segments Of The Population Is TEK Being Lost?

A significant positive correlation was found between age and plant knowledge ($p < .05$). If the ages are divided into groups (18-30, 31-40, 41+), a significant difference remains only between the 31-40 year olds and the 18-30 year olds, with the youngest generation possessing the least TEK ($p < .05$). The difference in knowledge between the younger and older populations

remains consistent in interviews and surveys across geographic boundaries.

Geographic differences in plant knowledge appear to be related primarily to lack of TEK among urban residents of Paramaribo, with both Para/Wanica and Nickerie demonstrating significantly more TEK than Paramaribo ($p < .01$ and $p < .05$ respectively). Of those surveyed, for example, 45% of residents of Paramaribo could not name a single treatment for diarrhea, compared to 14% of those in Para/Wanica and 0% of those in Niew Nickerie without knowledge of treatements. In addition, of Paramaribo residents who knew at least one phytotherapy, 45% knew only the guava plant (Psidium spp.), out of the 24 species mentioned in the study.

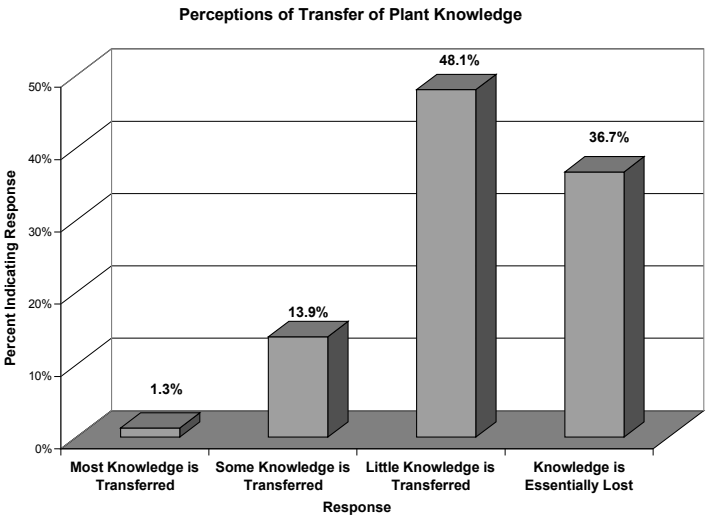

Figure 1

A strong sense of TEK loss was evident in all regions sampled with no significant differences across geographic boundaries. More than 82% indicated that little or no TEK was being transferred from the elders to the younger generations (Figure 1). Most individuals interviewed were modest about their own plant knowledge and felt that their elders knew more plants and their uses.

To What Extent Is The Transmission Of Traditional Plant Knowledge Valued?

Overall, the vast majority of the participants (75%) indicated that the preservation of traditional plant knowledge was very important (Figure 2). There was, however, no significant correlation between level of plant knowledge and the perceived value of plant knowledge. While TEK appears in decline among Surinamese residents, nearly all (91%) feel that efforts are needed to preserve plant knowledge for future generations. Both young and elderly stated in interviews that they prefer the traditional plant medicines and will use them if prescribed by a knowledgeable shaman; modern medical treatments were acknowledged, however, as being very important as well. A majority of participants (64%) indicated that they thought the future of healthcare in Suriname lies with a combination of modern medicine and traditional plant therapies.

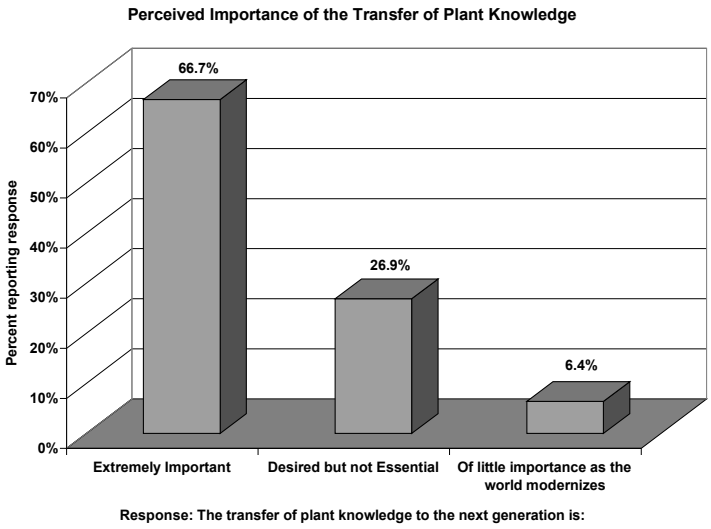

Figure 2

In What Ways Do Surinamese Believe TEK Could Most Efficaciously Be Maintained?

When asked whether public schools should play a role in preserving traditional plant knowledge, 82% of those surveyed indicated that the national curriculum should include at least awareness of medicinal plants, and 16% advocated specific instruction on edible and medicinal

plants. No significant difference existed in the reported value of plant education in schools across geographic regions. A significant, positive correlation was found, however, between plant knowledge and the degree to which participants believe plant education should be taught in schools ($p < .05$) as well as between age and the degree to which participants believe plant education should be taught in schools ($p < .05$).

When asked how well traditional plant education was addressed in local schools, Nickerie's schools, those farthest removed from Paramaribo, were perceived to have better plant education than either Para/Wanica or Paramaribo ($p < .01$).

DISCUSSION AND CONCLUSIONS

Knowledge to properly use phytotherapies appears to be waning within the younger Surinamese population. Aware of TEK importance and its loss, most participants across age groups indicated interest in some level of traditional education in the schools. The challenge for the unified educational system in Suriname is to find a way to provide locally relevant learning experiences that contribute to natural resource conservation and the Education Ministry's goal of developing in young people skills, attributes, and values to enable them to take more control of their health and lifestyle choices.

Given the wide support for traditional plant education in the schools, a trial IEEIA (Hungerford et al., 2003) curriculum – introduced to in-service and pre-service teachers at the Anton de Kom University in 2006 – is recommended in which the TEK issues are at the center of student investigations. Monitoring knowledge gains and increased issue awareness among students could be accomplished with national assessments of TEK and environmental literacy. Evaluations would provide a gauge of efficacy for using such a model to address, and perhaps, stem the loss of valuable traditional ethnobotanical knowledge.

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