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Wild, Tame, and In-Between: Traditional Agricultural Knowledge of Taiwan Indigenous People

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INTRODUCTION AND BACKGROUND

Many of us would agree that Senator J. William Fulbright’s vision of “a world with a little more knowledge and a little less conflict” will feature healthy ecosystems, appreciation of cultural diversity, and of course, delicious food. However, the world has been moving in the wrong direction over the past century. Today, 75% of the world’s plant food is made up of only 12 species. As of 2010, three (rice, maize, and wheat) provided nearly 60 percent of the calories and proteins that humans derive from plants (F.A.O 2010, 1999) and this trend continues (Khoury et al. 2014). This dramatic impact on the world’s agro-biodiversity is accompanied by accelerating environmental degradation, the loss of diverse cultural understandings and appreciation of food, and an increasingly bland globalized menu – one that isn’t even very healthy.

Luckily, diverse culture and food have an ancient and fascinating history in Taiwan. Hunting and fishing practices stretch back to Paleolithic times, and the earliest farming of rice and millet date to Neolithic pioneers who likely migrated to Taiwan from across the Taiwan Strait around 6,000 years ago (Chang and Goodenough 1996, Li 2013, Tsang 2005). Growing from these ancient roots, the earliest indigenous farmers developed a mosaic of agricultural techniques that take full advantage of mountain, plain, and coastal habitats. Their descendants took to the high seas, exploring and trading with the islands of Southeast Asia, then dispersing to the farthest reaches of the Pacific Ocean (Liu 2009, Rollett et al. 2000). In addition to a seafaring maritime diet, it’s likely these people packed a variety of crops for experimentation in new lands (Bulbeck 2008).
My personal journey to Taiwan is also rooted in restlessness. It began when my father Jiunn Yu, born and raised in Taichung, boarded a plane to America in 1960 in pursuit of a degree in electrical engineering. Barely speaking English, he took a bus across an America roiled by the Civil Rights Movement, where in southern states mixed-race marriages were illegal. By cramming hard and working nights as a janitor, he was awarded a scholarship. And by July 1964, he had earned his PhD, met and married my American mother, and began a family.
My childhood awareness of our family’s mixed race background, and growing up alongside many Native American friends in New Mexico, set my path for anthropology. After a stint as a Forest Service archaeologist, by 1992, I was conducting fieldwork in Venezuela amongst a forager-gardener tribe. I learned a great deal about the role of traditional knowledge in the subtropical human-food-environment nexus – from lifetime practicing experts (Greaves 1997, Yu 1997). These foragers were not interested in settling down to farm, even after being faced with pressure from the government. Fascinated by the tribe’s resolve, I focused my dissertation research on the archaeological traces of ancient decisions to switch from foraging to farming in America’s desert southwest. For nearly 20 years as a government archaeologist, I continued to learn from Native colleagues and experts and collected data in other regions, gaining appreciation for the role of traditional ecological knowledge in asking well-informed questions about the past.
When my father moved back to Taiwan in the 2000s, I jumped on the opportunity to see him. We visited the Atayal village of Smangus and Thao villages near Sun Moon Lake, and there I saw an opportunity to bring family history and research interests together full circle. With the generous support of Fulbright Taiwan, I embarked in December 2016 on a long-term project to learn more about the evolutionary side of indigenous Taiwanese farming.

ANCIENT DECISIONMAKING

The momentous step of producing our own food, which happened independently at least six times across the world, involved a series of decisions by foraging people who, up until that point, relied exclusively on wild resources. New data about foragers (Kelly 2014) shows that the decisionmaking process is much more interesting, complex, and relevant than researchers – mostly the descendants of farmers – have previously assumed. To study these ancient decisions requires knowledge about key characteristics of ancient environments and cultures.

Traditional agricultural knowledge has detailed information about adaptational characteristics of old crop types that would have influenced the decision to move from foraging to farming. This knowledge can help us develop conceptual models for how quickly the transition may have happened, when it might revert back to foraging, and why.

Figure 3. A Pumé forager of Venezuela, digging wild roots in 1993. They have deliberately chosen not to cultivate seed crops. Photo credit: Charles Hilton.

My research under the Fulbright Senior Scholar fellowship focuses on traditional agricultural knowledge of old crops and edible wild plants among the Amis and Paiwan people. My working hypothesis is based on background ethnographic research, much of it by Dr. Lo Su-mei and Dr. Hu Jer-Ming, on wild edible plants. This research was facilitated by strong, long-term relationships already established by researchers at National Taiwan University: Dr. Lo Su-mei and Dr. Hu Jer-Ming work in Amis communities, and Dr. Chen Maa-ling in Paiwan communities.

I have expanded my original list from taro, millet, and rice to include data for newer crops that influence use of the ancient varieties. By using an evolutionary approach, I can assess the costs and benefits of different crop types and farming techniques, and how wild plants complement cultivated varieties. This approach will give insights into the reasons that agriculture might or might not attract an inquisitive but non-committal forager, and a potential rank order of crop adoption once the decision to begin farming has been reached:
Edible wild plants, semi-domesticated plants, and tubers (taro and sweet potato) require little management and are versatile and resilient to minor fluctuations. Millet and *Chenopodium formosanum* (*hong li* in Mandarin) require the most intensive management for sowing, thinning, maintenance, harvest, and storage. Dry rice farming is intermediate. I expect that indigenous farmers today will describe them along a roughly graded scale from low cost/low risk/moderate yield to high cost/high risk/high yield.

To test this hypothesis, I conducted oral history interviews with tribal elders in the Amis communities of Donghe, the Atayal communities of Nanshan and Wulai, and the Paiwan community of Gaoshi. I also mapped six gardens or fields, and conducted three “focal follows” of individuals working in the fields and gardens. Finally, to get a better idea of the technology of Taiwan’s first farmers, I examined and measured a sample of earliest Neolithic stone tools and animal remains at the National Taiwan University Museum of Anthropology.

Figure 4. Myself in the field near Donghe village, juggling GPS unit, notebook, and camera.
PRELIMINARY RESULTS

The preliminary results of my fieldwork appear to support the hypothesis that seed crops are overall more costly in time, labor, and resources and more risky in returns compared to tubers and wild edibles. However, once those risks are overcome, their yields can be quite high. An interesting example is removing extra seedlings, or “thinning;” most of the people whom I interviewed agreed that wild edible plants sprout in any garden or field, and require little time to mature and thinning is not required. Taro and other tubers can be planted vegetatively (just using a stem), and thinning is not required.

On the upper end of the spectrum, millet, hong li, and rice all must be thinned after they sprout. Rice seedlings can be simply replanted to new paddies. However, millet and hong li seedlings require rain softened earth, and if conditions are too dry, the seedlings must be discarded. This introduces an element of risk and wastage. The body of ritual knowledge surrounding millet is consistent with an
understanding that this plant is a high risk, high return investment. Thus, oral history data for post-planting cost, risk, and benefit support my current hypothesis of low to moderate to high for Taiwanese crops.

The role of edible wild and semi-domesticated plants is significant in traditional farming knowledge, particularly among Amis farmers (Lo and Hu 2014). Wild plants are encouraged in fields and gardens, people make frequent gathering trips to field-mountain zones, and most families eat wild plants daily. The Donghe Amis are very particular about keeping them chemical-free. Other indigenous groups reported that wild plants are eaten less frequently or have been abandoned. This information has important implications for the foraging to farming interface: wild plants have been an dependable, nutritious complement to cultivated crops from the beginning. Semi-domesticated plants such as the bird’s nest fern (Asplenium spp.) would have allowed for a low-cost food source that could be encouraged in shady forested settings adjacent to open fields.

Another unexpected piece of information concerns constant pilfering of crops by monkeys, birds, insects, deer, and other predators. Monkeys in particular can cause an entire harvest to be lost. Clearly, the vulnerability of above-ground domesticates requires extensive pest control measures and constant human monitoring, an important consideration to a mobile forager pondering a switch to farming.
Figure 6. Fern garden in the forested hills above the Amis village of Donghe. Muntjacs or ‘barking deer’ commonly eat these ferns.

Finally, a very interesting aspect of recent interviews involved historic economics. The oldest interviewees gave detailed information about the effects of Japanese colonial period levies on rice: the commandeering of indigenous rice harvests had cascading effects that included the cessation of rice consumption by indigenous farmers, heavy dependence on taro, sweet potatoes, and wild plants to feed households, and reduced cultivation of labor-intensive millet and hong li. The pattern continued in a slightly different form after the departure of the Japanese, with taxation and exorbitant charges by some rice processing facilities. This information from my interviewees supports the characterization of tubers and wild species as dependable fallbacks when seed crops are not available due to climate, monkeys, rapacious government officials, or any other reason.

The next step is archaeological assessment of this hypothesis to evaluate its usefulness in explaining the agricultural transition. Potential lines of evidence include reliable chronological dates, analysis of stone tools for starchy or fatty plant residues, sampling cultural soils for micro-botanical remains, and analysis of shapes and wear patterns on possible plant processing artifacts. Two important geographic areas are the earliest Neolithic of Taiwan (Dapenkeng Culture, c. 6,000-5,000 years before present) and earliest Polynesian societies (Lapita Culture c. 3,500 years BP).

REFLECTIONS and CONCLUSION

Indigenous elders paint a detailed picture: Taiwan’s rich indigenous farming heritage has been repeatedly impacted by geopolitical and economic shockwaves in recent years. After the departure of the Japanese, indigenous farmers tried planting rice again, but price gouging and illegal high interest loans associated with Han-owned rice processing facilities drove indigenous farmers away once more. In the 1960s and 70s, many turned to deep sea fishing along the east coast or jobs of the urban industrialized economy. The resulting absence of young people has dealt a heavy and irreversible blow to traditional millet farming, and indeed indigenous cultural continuity, across the island.

Yet, pockets of traditional agricultural knowledge persist in many communities (Lo and Hu 2014). The revitalization of millet and hong li is developing in Paiwan country, and along the east coast, traditional ecological knowledge about wild and semi-domesticated plants remains strong and multi-generational. Increasing participation of indigenous communities in land management, particularly in forested mountains, can potentially establish new criteria for sustainable management of hunted species alongside cultivated lands. And anthropologists are in a position to help. In Donghe village, an Amis man memorably said: “The things we tell you might become lost except for anthropologists who write them down. We are glad you’re doing this.” For thousands of years, through sea level rises and falls, droughts, landslides, typhoons, and earthquakes, colonization by Dutch, Spanish, Japanese, and Han people, through war, poverty, loss of land, culture, language, and family life, traditional agricultural knowledge has made it possible for indigenous communities to carry on. This knowledge originated with ancient Neolithic farmers and made possible one of the greatest episodes of seafaring migration and colonization in the history of humanity.

In closing, the expression of Taiwan’s indigenous agricultural knowledge in varied crop types, habitats, and techniques offers potential insights into the cultural evolution of other sub-tropical centers of agriculture. Further, indigenous Taiwanese crops and cultivation techniques can inspire and inform the development of conceptual models for diverse, resilient food production systems in our rapidly changing world.

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References


