Ahupuaʻa

How were the people, land, and ocean connected in early Hawaiʻi?

The native people of Hawaiʻi have deep spiritual connections to the land, sea, sky and other elements of the natural world (Liliuʻokalani, 1897). The cultural traditions and the ways they were transferred to each new generation, through practice and example, ensured the continuation of healthy ecosystems.

Traditional Hawaiian cultural practices reflect a close relationship to the *ʻāina*. *ʻĀina* — that which nourishes — is not just the physical environment that sustained the people in early Hawaiʻi; it encompasses many manifestations of the gods. Plants and animals, and even the *pōhaku* (rocks), and rain clouds, are believed to have *mana* (spirit). The god Lono is manifest in the rain clouds, pigs, gourds and sweet potatoes. Kāne is embodied in taro, sugar cane, and bamboo. Kanaloa is manifest in bananas, squid and some other forms of marine life. And Kū is embodied in the coconut, breadfruit and a variety of forest trees (Handy and Handy, 1991).

The most important food plant, *kalo* (taro), is the progenitor of the Hawaiian race, and is still considered the greatest life force of all foods by native Hawaiians. To them it is a manifestation of the first-born son of Wakea (sky father) and Papa (earth mother).

ʻO mākou nā keiki	We are the children
Nā keiki o ke kalo	The children of the taro
ʻO ka ʻai pulapula	Food of the offspring
E ola ke kanaka	Brings life to man
E ola ke kalo	The taro lives
E ola ke kanaka	Man lives

(*Keola Morales, excerpt from Nā Keiki O Ke Kalo, 2003, Armitage, 2006*)

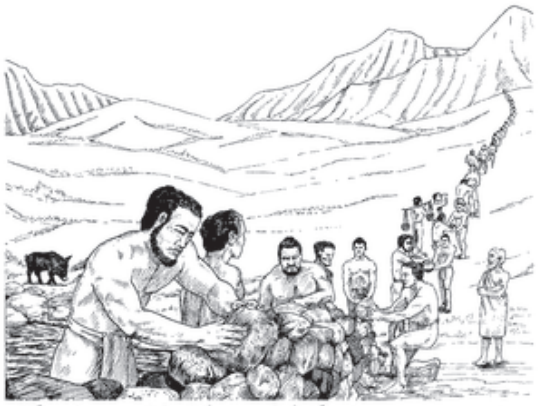
Kalo symbolizes the importance of *ʻohana* (family). Its *ʻohā* (offshoots) are the *keiki* (children) that are connected to the corm, which is the *makua* (parent). When the *keiki* are separated from the parent, they are nourished by the land and water and grow to adults. *ʻOhana* also means "many offshoots."

Loʻi Kalo – Taro Terraces

Early Hawaiians developed an extensive and innovative system of irrigation to grow *kalo*. They built *ʻauwai* (ditches) to bring water from streams into their *loʻi kalo* (taro terraces) and constructed small rock and earthen dams to regulate the flow. Fresh water was viewed as sacred, and the rights to its use were directly related to the amount of labor that farmers contributed to building and constructing the *ʻauwai* (Handy and Handy, 1991). The traditional Hawaiian system of irrigating *loʻi* made intensive cultivation of *kalo* possible and ensured that water was distributed fairly and used wisely in the *ahupuaʻa* (land divisions).

SHORELINE FISHPONDS

Hawaiian innovation extended to the shoreline with the development of *loko kuapā* (fishponds with a rock wall, unique to Hawaiʻi) and *loko puʻuone* (fishponds with a natural sand bank between the pond and the sea) that early Hawaiians engineered to cultivate fish. These Hawaiian structures were built to provide a steady supply of fish for the *aliʻi* (chiefs). The *loko kuapā* were built on reef flats with the labor of many hands. *Laulima*, literally "many hands," refers to the cooperation that was necessary to pass the stones and construct the walls of the fishponds.



The *ʻauwai kai* (canals) that were constructed in the both types of shoreline fishpond walls are an example of Hawaiian ingenuity. These canals had a number of important functions. They created currents that attracted fish, allowed water to circulate in the pond, and flushed out sediments and nutrients with the outgoing tide. The innovation of the *mākāhā* (gates) allowed young fish to enter the ponds where they would flourish and grow into adults that would not be able to escape. And since the fish were attracted to the current in the *mākāhā*, they were easily

caught in the *ʻauwai kai* during outgoing and incoming tides. The *mākāhā*, according to George Uyemura, a well-known manager of Moliʻi *loko kuapā*, was and still is the most important feature of Hawaiian fishponds. (George Uyemura, 2007).

AHUPUAʻA – TRADITIONAL LAND UNITS

Ahupuaʻa are traditional Hawaiian land units that usually extended from mountain summits to the outer edges of reefs. The water that coursed through the *ahupuaʻa* carried nutrients through the *loʻi* and downstream into the *muliwai, loko kuapā* and *loko puʻuone* where certain species of fish were attracted to the *wai kai* (brackish water). In old Hawaiʻi, food and other supplies were shared between people of the uplands and people of the sea (*kō kula ʻuka, kō kula kai*) as well as between neighbors so that no one went without.

Hawaiians relied on natural resources in the *ahupuaʻa* to create the materials so essential to survival. They tested various plant fibers for strength and flexibility and developed strong cordage from plants such as *niu* (coconut), *hau*, and *olonā*. Hawaiians developed various methods for making cordage by twisting plant fibers together. They used the cordage to tie the timbers of

their houses together, to make their canoes, and to fashion weapons and a variety of innovative tools.

Unit Overview

The essential question addressed in this unit is: How do Hawaiian practices nurture a healthy relationship to the *ʻāina*, and how can we give back to the *ʻāina* today? In the course of the unit, students explore this question through *moʻolelo* (legends), models, maps, group projects and field excursions to *loʻi kalo* (taro terraces) and *loko iʻa* (fishponds) in the *ahupuaʻa.*

In the first lesson, **Our *Ahupuaʻa***, students learn how land was divided in old Hawaiʻi and draw and label a diagram of their *ahupuaʻa* showing key geographic features. Students read a Hawaiian story of place and write a response about the life lesson in the story. Finally, students illustrate the characters, setting and plot on their *ahupuaʻa* diagram.

In the second lesson, **The Case of the Strongest Cord**, students put their scientific investigation skills to the test as they discover the value of cordage in old Hawaiʻi. They make cordage from a variety of plant fibers, form hypotheses, and design experiments to test the strength and flexibility of various types of cordage.

The third lesson, **Engineering Ingenuity**, engages students in building model fishponds and experimenting with changing water levels outside the pond wall to simulate what happens with the rising and falling tides. In this investigation, students discover the innovation of the *mākāhā* and its unique function in cultivating fish.

In ***Mauka-Makai* Connection**, the fourth lesson, students create, observe and analyze a model of the traditional Hawaiian irrigation system for growing *kalo* and draw insights and conclusions about water use in old Hawaiʻi and today.

The culminating activity, **Giving Back to the *ʻĀina***, gives students an opportunity to apply what they've learned in the unit. Students explore a *loʻi kalo* and a *loko iʻa* (fishpond) where they take part in service learning projects to give back to the *ʻāina*. They also gather information to use in preparing their *ahupuaʻa* unit projects and final papers.

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