

A Plan to Save Iguanas, and the Rain Forests in the Bargain

Farmers would save trees if they raised lizards as a food crop.

By LINDSEY GRUSON

OROTINA, Costa Rica
Despite their forbidding appearance, iguanas have been hunted as a delicacy in Latin America for thousands of years. But the herbivorous lizards have become one more victim of the deforestation and overpopulation that are ravaging the region's rain forests.

Now an effort is under way to raise thousands of iguanas. The immediate aim of the internationally financed project is to preserve the lizards by putting an iguana in every pot — making it possible and profitable for tropical farmers to raise the languid reptiles, which live in or under trees. Latins affectionately call the reptile *gallina de palo*, or chicken (hen) of the tree.

The ultimate goal, one part of a multi-pronged tropical research program, is nothing less than saving the rapidly vanishing rain forests. An estimated 52 acres a minute are being felled, often by farmers who slash and burn to clear land for crops and cattle.

Breaking a Cycle of Poverty

It is a vicious cycle of destruction. Stripped of its natural cover, the thin and acidic soil is quickly depleted of nutrients and eroded by tropical rain storms. Within a few years, it is exhausted, forcing hungry families to renew their attack on the forest.

Managers of the iguana project here hope to break that cycle of poverty by persuading peasants to save the trees as a home for their iguanas. The researchers see iguana farming as the first step toward the creation of a diverse agriculture system based on the forest. Instead of changing the environment to suit the needs of livestock, farmers would select animals that complement the natural vegetation.

If reared in captivity and released into the wild as yearlings, the iguanas can produce at least as much high-protein meat per acre as cattle, studies have shown. The meat tastes like chicken, said Fernanando Enrique Gerrero, who used to hunt iguanas with bows and arrows and slingshots and now is part of the conservation effort. "They were a real feast," he said.

Researchers say iguanas, now virtually extinct in Costa Rica, would help reverse the economic incentives of ranching and could begin to make conservation profitable.

"What we need to do is find alterna-



The New York Times

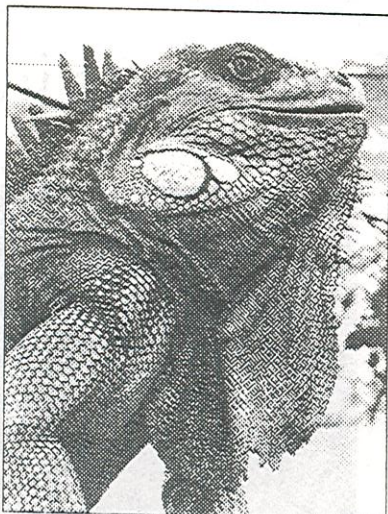
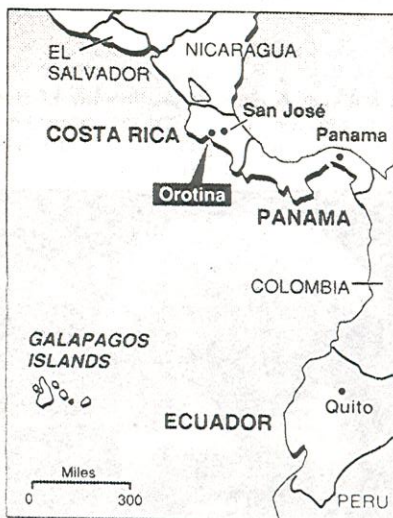
Dr. Dagmar Werner, director of the Green Iguana Foundation, holding an iguana called Ignacio at the experimental station in Costa Rica.

...tive ways of farming that are as economically feasible as the destructive patterns," said Dr. Dagmar Werner, the West German director of the project, the Green Iguana Foundation. "I want to show that you can make just as much money without ruining the environment. If we can do that, the future is ours."

The envisioned ranches would boast green iguanas munching in trees and black iguanas sunbathing on the ground. Farmers would raise turtles or crocodiles in ponds and

rivers and deer in fields. The boundaries between open space and forests would be home to pacas, an unusually nutritious rodent that tastes like suckling pig and looks like a cross between a dog and an oversized guinea pig.

Such farms remains a distant vision. But the researchers, who are working on projects started seven years ago by the Smithsonian Tropical Research Institute, have made important strides. In a latter day version of the Incas domesticating the



The New York Times/Lindsey Gruson/Aug. 22, 1989

Iguana farming project at Orotina, Costa Rica, is aimed at taking pressure off nearby tropical forest. Raised in captivity and released into the wild, the iguanas can produce as much high-quality protein as cattle.

guinea pig, Dr. Nicholas Smythe has tamed a group of the fiercely solitary pacas, a Latin delicacy since before the Spanish conquest. He recently reported that pacas he raised on an island in the Panama Canal are so sociable that they sleep in groups and approach humans.

But it is the iguana project that has made the most progress. Before Dr. Werner began her work, scientists had dismissed the idea of lizard ranching as impractical. Studies had found that floods and predators destroyed more than half of their eggs and that just 4 percent of hatchlings survived a year, a daunting overall one-year survival rate of 2 percent. Several attempts to collect and incubate the eggs had also failed.

But Dr. Werner, who earned her doctorate from the University of Basel while studying iguanas on the Galapagos Islands, quickly succeeded in devising a production line for iguana eggs and hatchlings.

'All the Right Decisions'

She built a laying nest using a drainage pipe and an underground chamber of concrete block. The morning after she buried it, the nest was filled with eggs. About 95 percent hatched after incubation, proving it was possible to increase the birth rate and "mass produce" lizards.

Dr. Werner now makes nests from cheap styrofoam coolers, which allows her researchers to harvest eggs in a couple of minutes and to identify the layer of the egg, a critical step in her genetic studies.

"In five years, she has domesticated an animal that might normally have taken thousands," said Ira Rubinoff, director of the Smithsonian research institute in Panama. "Sometimes you hit, and sometimes you lose. But she made all the right intuitive decisions. We never thought

we'd get so far so fast."

Reducing the iguanas' infant mortality rate solved only the first problem. Dr. Werner still faced what appeared to be an even steeper economic hurdle. It is uneconomical to shelter and feed the slow-growing lizards for the three years it takes them to reach their full length of six feet. So she set up feeding stations in the nearby woods and freed the 7-month-old hatchlings.

Like many other of her decisions, it was largely based on intuition. But it quickly proved correct. Studies of six

A scientist's intuition leads to 'mass production' of the creatures.

releases totaling several thousand iguanas over almost three years have shown that 50 percent survive and stay put. That has proved that iguanas can be raised without expensive fencing.

"Iguanas don't run away," said Dr. Werner, who introduces herself as "Mama Iguana." "They just sit in the trees munching on leaves."

Dr. Werner calculates that a farmer using feeding stations can raise 109 6½-pound iguanas a year on 2.5 acres of forest, of which from 70 percent to 82 percent of the iguana, depending on local custom, is usually eaten. The owner would produce 650 pounds of low-fat meat, a better and healthier yield than many Latin cattle ranches.

At 50 cents a pound, the farmer would earn at least \$3.25 a lizard

while improving the diet of his family. He could boost his income by raising a few pacas, which in Panama often fetch \$100 apiece.

Dr. Werner tested her ideas in 1986 in two rural villages in Panama, where she was based before leaving because of political turmoil. Since the farmers were given cages, nests and incubators and expert advice from a biologist and a forester, the experiment did not reflect many real life conditions. But it indicated that iguana farming might make conservation and possibly reforestation economic.

"Nobody burns the forest any more," she said. "The villagers are very enthusiastic and are planting trees like mad."

But Dr. Rubinoff said more research on nutrition and genetics is needed before he would be ready to encourage commercial iguana ranching. Dr. Werner said she also needed to investigate lizard diseases and how they spread and adapt her work to other types of iguanas in foreign countries.

But she says she is having trouble raising money for her research. The project was originally financed by the W. Alton Jones Foundation, a Virginia-based conservation group. But the grant ran out last year and the research is now financed by the World Wildlife Fund, the Dutch Government, the United States Fish and Wildlife Service and the International Union for the Conservation of Nature and Natural Resources.

Dr. Werner, a professor of wildlife sciences at the University at Costa Rica, is working to make raising and feeding iguanas cheaper and easier. In a recent study at her Panama plantation, she found she could maintain the same number of lizards even if the distance between feeding stations was increased to 40 meters from 10.

But a crucial step in making iguana ranching profitable will be to accelerate the lizards' growth. Dr. Werner has found that a fat iguana always lays more and bigger eggs and that the hatchlings reproduce earlier and grow quicker than the offspring of a thin lizard. By improving diet, she has accelerated the maturation of iguanas by a year. It takes about six months for her hatchlings to grow six-inch snouts as against 1½ years in 1984.

A chicken gains as much weight in four months as an iguana does in three years. But the lizard eats much less since it is sedentary and cold blooded. It only consumes 3 percent of the food needed by the same size bird or about 5 percent of what an equivalent sized mammal requires.

"Even if it takes longer for an iguana to put on weight, it's cheaper," she said. "The iguana doesn't invest energy into maintaining a stable body temperature. It sits around doing nothing unless it wants to eat or flee."