

THE HAWAIIAN ENVIRONMENT

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The Hawaiian Islands consist of many individual islands located in the Pacific Ocean, extending from 154°45' to 179°15' west longitude, a distance of over 1600 miles, and from 16°30' to 28°30' north latitude, a distance of over 850 miles. This circumscribes an area of over 1 1/3 million square miles — the only trouble is that there is so much of it underwater.

Scientists tell us that the Hawaiian Islands are of volcanic origin but the date of the formation of the islands above the surface of the ocean is still unknown. For centuries limestone and coral deposits accumulated to form the islands as we know them today, extending from Kure Island just northwest of Midway to Hawaii Island on the east and Johnston Island on the southern extremity. The mineral content of the volcanic material has made the soil of the islands tremendously fertile and productive.

Hawaii, as most of us think of it, is comprised of six major volcanic islands between 19 and 22°15' north latitude and 2,700 miles from the nearest continent. Northeast tradewinds prevail and, combined with topography and altitude, provide environmental conditions ranging from wet tropical to dry subtropical and desert, to temperate and even alpine. Crop plants and people came only very recently. The 790,000 people here today are primarily of Japanese, Caucasian, Chinese, Filipino, and Polynesian ancestry, in that order.

The state is comprised of 4.1 million acres, of which "jungle" forest is 49%; brushy grasslands, 17%; mountains, new lava, canyons, 17%; agricultural crops, 8%; parks, 6%; and urban, industrial, military, 3%.

The present total agricultural area, including grazed lands and croplands, comprise 38% of the total state area. However, only one-fifth of the agricultural lands, or 325,000 acres, are croplands. And of this area, 300,000 acres are devoted to plantation culture of sugar cane and pineapple. This leaves about 25,000 acres for all diversified crops, of which 13,000 are devoted to orchards, 2,500 to vegetables, and 2,500 to field crops.

Present gross state product is approximately \$4 billion. Agriculture is approximately \$525 million; comprised of sugar,

Ed. Note: Dr. Bullock showed a series of slides illustrating the propagation and culture of the many agricultural crops of Hawaii, such as sugar cane, coffee, pineapple, macadamia, papaya, and guava.

\$210 million; pineapple, \$135 million; livestock and diversified crops, \$180 million.

The controlling factors which decrease the intensity of land use are rough topography, high elevation, presence of lava rock, thin and infertile soils, and inadequate and unfavorable rainfall distribution. Lack of rainfall or water for irrigation excludes extensive low-elevation areas from intensive cropping. Under the prevailing economy in Hawaii, lands and supporting facilities are utilized first for the plantation crops of cane and pineapple with a steady worldwide demand and a fair margin of profit for sugar on a gross income of \$600 to \$800 per acre. Second choice goes to the small, fluctuating market crops of fruit and vegetables, which gross \$2,000 to \$3,000 per acre per year. Third choice goes to field crops, which because of mass production elsewhere, will gross \$100 to \$500 per acre per year. The last land-use category is range or cattle grazing, which averages only \$10 per acre per year. While increasing rapidly, more intensive greenhouse crops and ornamental nursery crops still comprise a small percentage of the total.

The military and other federal government activities contribute 125,000 to the population and nearly 1.5 billion dollars in annual expenditures in the state. The visitor industry brings to the state over 2 million people annually who leave with us \$700 million. To keep up with this activity, a construction industry is completing \$700 million worth of building annually.

These are some of the characteristics, advantages and constraints of the Hawaiian environment. Changes are coming fast and we in Hawaii are moving rapidly to accommodate these changes.

MODERATOR WARNER: Thank you, Dr. Bullock. Our next speaker was born and raised in Honolulu in a family which specialized in floriculture. He received his Bachelors and Masters degrees at the University of Hawaii and his Ph.D. at Cornell University. His field is in breeding and culture of ornamental plants, particularly in breeding anthuriums. You can witness the examples of his work on the table outside. Through his efforts the College of Agriculture has released several new anthurium cultivars of superior quality. He is chairman of the Department of Horticulture, University of Hawaii, and is eminently qualified to speak on the subject, "Hawaiian Ornamental Industries." Dr. Kamemoto: