URBAN CONVERSION OF HAWAII'S AGRICULTURAL LANDS, 1975-89

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ABSTRACT

Petitions submitted from 1975 to March 1989 to the Hawaii Land Use Commission (LUC) for reclassification of state Agricultural District lands were analyzed. Results showed nearly 24,000 acres were removed from the Agricultural District over the period. Farmland conversions rose sharply in the 1980s to approach 3,000 acres per year. The LUC approved an average 80% of the petitions and 74% of the area transferring agricultural land to the Urban District, primarily for housing developments. Oahu recorded the highest rate of urban conversion and a significant loss of high-quality agricultural lands. Conversions increased greatly on Kauai, while Maui's rate of farmland loss fell. Large areas urbanized on the Big Island were partially offset by additions to the Agricultural District, and little Prime crop land was converted.

KEY WORDS: Agricultural land; Land use districts; Urbanization; Prime lands

INTRODUCTION

Availability of good agricultural land is critical to the survival of Hawaii farmers. As an island state, the supply of land well suited for farming is scarce in Hawaii compared to the U.S. mainland. Although the agricultural sector may be unable to fully utilize all available acreage at a given time, some consider high-quality farmland an irreplaceable resource that should be preserved for future generations. Increasing population and economic growth in Hawaii, however, create strong pressures to convert more land for urbanized developments. Agriculture on many other small Pacific islands faces similar threats.

In 1961 the Hawaii legislature acted to protect the state's prime agricultural lands by passing the Land Use Law, which imposed statewide zoning and regulation of land use (see DeGrove, 1984). Under the law, all land is classified into one of four districts—Agricultural, Rural, Urban, or Conservation. Reclassification of land to another district requires approval of the state Land Use Commission (LUC), which may be obtained through individual petitions to the LUC or in five-year reviews of district boundaries.¹

Several studies have analyzed Hawaii Agricultural redistricting petitions and farmland conversions which occurred in varying periods following passage of the Land Use Law up through 1977/78.² In the early years, the LUC approved a relatively high proportion of the petitions to reclassify land out of the Agricultural District, around 80% in Kauai and Maui County and 55-60% on Oahu and Hawaii (Lum, Camp and Gertel, 1969). In terms of the acreage requested by petitioners, LUC approval rates on the neighbor islands were even higher at 85% or more, while the Oahu rate was about 10 points lower (Eckbo, Dean, Austin and Williams, 1969). Excepting Oahu, acreage approval rates appear to have fallen dramatically during the late 1960s into the 1970s, though approvals on Kauai remained above 80% (Lowry et al., 1977). Despite the decline in rates, a significant amount of farmland was transferred to the Urban District and, in the case of Maui, to the Rural District. For the 1962-77 period overall, the largest urban conversions were recorded on Oahu (641 acres/year) and the Big Island (508 acres/year). Maui County and Kauai losses averaged 335 and 76 acres per year, respectively (Lowry et al., 1977). Reports also suggest an undue portion of the converted acreage was prime agricultural land,³ up to 39% for Oahu and 23% for Kauai in the 1960s (Baker and Dill, 1969; Eckbo, Dean, Austin and Williams, 1969).

¹ The boundary review process was abolished in the 1975 reform of the Land Use Law, discussed by DeGrove (1984) and Lowry (1980). Hawaii LUC (1975) and Lowry et al. (1977) cover Agricultural District land reclassifications from the two boundary reviews that were conducted in 1969 and 1974.
² See Baker and Dill (1969), Eckbo, Dean, Austin and Williams (1969), Lum, Camp and Gertel (1969), and Lowry et al. (1977).
³ Early LUC studies utilized the Overall Productivity Rating (OPR) soil classification system, where "prime" is defined as Class A or Class B lands.
1969) and about 20-30% for Maui and Oahu over 1962-74 (Lowry et al., 1977). Where recorded, farmland conversions on all islands were mostly for residential use.

Little research has been published since the late 1970s documenting recent trends in state Agricultural District reclassifications and urbanization of Hawaii’s agricultural lands. This study analyzes petitions that were submitted to the LUC since 1975. Our objective was to determine the quantity, location, rate, characteristics, and converted use of agricultural land losses which have occurred over the period. The results can provide insights to researchers and the agricultural community on the direction and future prospects for the availability of suitable farmland in Hawaii and other Pacific island groups.

DATA COLLECTION PROCEDURES AND COVERAGE

Information on petitions submitted to the LUC for Agricultural District reclassification was obtained from the LUC office in Honolulu. Data were gathered from records and petition files maintained by the LUC staff, and included the following items:

1. Dates that a petition was submitted and resolved by the LUC;
2. Parcel’s land use district designation(s) at the time of petition, location, acreage and district(s) to which reclassification was requested;
3. LUC decision and number of acres approved for reclassification;
4. Parcel’s suitability for agricultural use as indicated by the ALISH (Agricultural Lands of Importance to the State of Hawaii) system, land use at petition time, and alternative use proposed in the petition to reclassify.

To make ALISH results comparable to previous LUC studies which used the OPR land classification system, analysis utilizes data taken from a published inventory of lands rated under different soil evaluation systems (Hawaii LESA Commission, 1986).

The LUC data cover all petitions to reclassify land into or out of the Agricultural District that were submitted from the beginning of 1975 to March 1989. For petitions involving parcels with multiple land use district designations, only the Agricultural District portion is considered. A total of 198 petitions were submitted over the 14 1/4 year period, of which 6 were still pending LUC final decision at the time of data collection. The latter are excluded from the analysis. Reappraisals of petitions previously withdrawn or denied are treated as separate observations.

Of the cases resolved during the period, a number of petitions were approved by the LUC with “conditions” or “conditions and increment.” Conditional approvals typically require the petitioning landowner or developer to undertake specified activities within the reclassified area, such as construction of roads or affordable housing. In an incremental decision, only a portion of the parcel receives immediate approval to reclassify. Approval of the remaining acreage is withheld to a later date, subject to satisfactory completion of the conditions in the earlier phase. For conditionally approved petitions, it was assumed that petitioners had indeed met the conditions imposed and that the entire area approved, including any increments, was reclassified at the LUC’s first decision date.

ALISH ratings were not recorded in the LUC files for some petitions, which are therefore excluded from this portion of the analysis. Complete data were available on land use at the time of petition, but the number of acres utilized for different purposes was usually not reported for parcels with more than one use. In such cases, the entire acreage is categorized according to the combined uses.

RESULTS AND DISCUSSION

Over 1975-89, Agricultural District land reclassifications primarily involved transferring agricultural land to another district. Nearly 24,000 acres were removed from the Agricultural District, 98% of which was placed in the Urban District. A significant percentage of the agricultural area reclassified on Maui (13%) and Kauai (4%) went instead to the Rural District. Table 1 details the net land reclassified (i.e., transfers into the Agricultural District minus transfers out) by island. Statewide, agricultural land losses averaged about 1,200 acres per year. Oahu experienced the largest absolute and relative declines, over half the state total. Net losses on the Big Island, Kauai and Maui were much lower, while little or no agricultural land was reclassified on Molokai, Lanai, or Niihau.4

Figure 1 shows the year-to-year gross area reclassified from the Agricultural to other districts. The sharp annual fluctuations mirror variations in requests by petitioners, and LUC approval of large residential or resort projects on different islands in alternate peak years. A lull in approvals also occurred at the beginning of the period, when very few cases were resolved due to changes in LUC procedures (see Myers, 1976). Using a 3-year moving average to detect

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4 Due to the small amount of area reclassified, Molokai is combined with Maui in subsequent analysis.
underlying trends, agricultural land reclassifications from 1975 into the 1980s averaged less than 1,000 acres per year, about 60% of 1962-77 rate reported by Lowry et al. (1977). In the mid-1980s farmland conversions jumped to over 2,000 acres per year, followed by an upward trend approaching 3,000 acres per year. As before, losses on Oahu and the Big Island accounted for the largest share (over 80%) of the increase since 1984. Table 2 compares petition requests to reclassify land from the Agricultural to the Urban District against LUC approvals. Petitions submitted from the neighbor islands were approved at rates of 80% or greater, comparable to 1962-77 figures. Oahu recorded the lowest petition approval rate at 68%, down 12 points from the earlier period. In terms of acreage requested, 1975-89 conversions on Oahu were approved at a similar (70%) rate, but this is over 50% higher than reported in previous periods. Acreage approval rates on the other islands also rebounded, with almost complete approval for Kauai reclassifications. Within the 1975-89 period alone, time-series analysis of annual petition and area approval rates did not reveal any clear trends. In early years, approval rates were generally low due to non-resolution of cases, mentioned above. During the rest of the period, rates fluctuated moderately around the averages given in Table 2.

Over 1975-89, petitioners requested urban reclassification for more than 30,000 acres of farmland (Table 2), nearly 80% from Oahu or the Big Island. Although these large requests were partially offset by smaller LUC approval rates, Oahu and Hawaii continued to experience relatively high conversions at 662 and 593 acres per year, respectively. More startling is the 232 acre annual loss on Kauai, three times greater than the 1962-77 rate. Urbanization of Agricultural District lands in Maui County, on the other hand, declined by more than half to 152 acres per year.

The loss of Agricultural lands to the Urban District was analyzed with respect to ALISH class and land use at the time of petition. In the ALISH rating system, a parcel is assigned to one of four land classes—Prime, Unique, Other Important, or Unclassified (residual). For land use at the time of petition, reclassified areas were categorized based on the type and intensity of use: (1) Intensive Agriculture, for cropped land and confined livestock operations; (2) Extensive Agriculture, mostly cattle grazing and pasture lands; (3) Mixed Intensive-Extensive Agriculture, a combination of the previous two uses; (4) Idle or Non-Agricultural Use, which includes vacant and open space areas, as well as lands used for plantation housing.

To allow comparisons with earlier studies on the quality of agricultural land converted, side analyses were conducted to establish a relationship between the ALISH and OPR classification systems. Cross-tabulations of ratings by island found a significant statistical correspondence between ALISH and OPR. The schedule below shows the OPR ratings which account for the predominant share (at least 70%) of land in a given ALISH class.

<table>
<thead>
<tr>
<th>ALISH Rating</th>
<th>Predominant OPR Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prime</td>
<td>Oahu, Maui: Class A or B</td>
</tr>
<tr>
<td></td>
<td>other islands: Class B or C</td>
</tr>
<tr>
<td>Other Important</td>
<td>Molokai, Maui, Oahu: Class B, C or D</td>
</tr>
<tr>
<td></td>
<td>Kauai, Hawaii: Class D or E</td>
</tr>
<tr>
<td>Unclassified</td>
<td>Class E</td>
</tr>
</tbody>
</table>

There was no OPR equivalent to the ALISH Unique Lands class.

Figures 2-3 present the distribution of agricultural land losses over 1975-1989 by ALISH class and land use at petition time. Over two-thirds of the converted acreage on Oahu were high-quality agricultural lands, well above the 30-40% share reported for earlier periods. Oahu losses included Prime sugarcane and pineapple lands, plus almost 800 acres of Unique rainfed pineapple land. There was little or no reclassification of Unique Lands on the other islands. Together with an increased rate of conversion, Kauai likewise experienced a substantially higher loss of Prime land amounting to more than half the converted area. Although 40% of the agricultural land reclassified in Maui County also came from high intensity uses, Prime land loss was a much smaller problem. Farmland conversions on the Big Island followed a different pattern more favorable to farming. Nearly 90% of the area urbanized had an Unclassified ALISH rating, and almost 80% was either idle, or being used for extensive agriculture or a non-agricultural purpose.

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5Chi-square (χ²) test for two-way association between the number of acres classified by ALISH and by OPR ratings. Due to the presence of a varying number of null cells for the different islands, degrees of freedom ranged from 4 to 12. The corresponding cutoff values for the χ² distribution at 1% significance are 13.28 and 26.2. Computed Pearson χ² test statistics were considerably higher, by island: Hawaii χ²=1,454,678; Kauai χ²=318,546; Maui χ²=554,351; Molokai χ²=145,998; Oahu χ²= 452,908.
Final analysis examined the intended urban use for lands removed from the Agricultural District. Parcels were categorized according to the primary use proposed, with four possible classes: (1) Residential, which includes non-hotel visitor units, plus land set aside within residential areas for community support facilities (e.g., stores, churches, roads or schools); (2) Resort, for hotels, non-residential golf courses, and other tourist-related recreational centers; (3) Infrastructure, government public works and development projects excluding residential construction and facilities in (1); (4) Commercial, including industrial uses. Figure 4 shows the distribution of reclassified land by proposed use. As in earlier studies, Residential was the largest single use on all islands, accounting for 77% of the converted acreage statewide. The next largest overall use was Resort development, which was most noticeable on Kauai. Government provision of infrastructure was another important source of urban conversions for Kauai and Maui County, utilizing 23% and 19% (respectively) of reclassified lands. Commercial operations accounted for a relatively small proportion of the farmland converted.

CONCLUSIONS

From 1975 to March 1989, the Hawaii Land Use Commission (LUC) approved petitions reclassifying nearly 24,000 acres from the Agricultural District. Compared to earlier years, a higher proportion of petitioned acreage was approved and, beginning in the mid-1980s, farmland conversions rose sharply. Virtually all former agricultural lands were transferred to the Urban District, primarily for residential development. During this same period, Hawaii agriculture has seen tremendous changes in land use. Sugar and pineapple plantation closings and reductions in cropped area have released over 60,000 acres from cultivation (HASS, various years). Farmlands previously used wholly or in part for intensive operations have provided a majority of the urbanized area statewide, including a 7,200 acre loss of Prime or Unique agricultural lands. While these conversions represent only a small percentage of the high-quality lands in the ALISH inventory (see p. II-95 in Hawaii DOA, 1981), different islands have been affected to varying degrees.

The decline in land availability for farming has been most severe on Oahu. Urbanization there has continued at its earlier pace, resulting in a significant loss of good agricultural land. More recently Kauai has emerged as a new problem area with greatly increased conversions to meet the demands of the island’s rising tourism sector, supporting infrastructure and housing. On the brighter side is the improved situation on Maui. As tourism on the island has matured, Maui’s rate of farmland loss has actually fallen. Molokai and Hawaii present the most promising picture. Little agricultural land has been reclassified on Molokai, and the island has retained its rural character. On the Big Island, the large areas lost to urban uses have been partially offset by additions of new land to the Agricultural District. More importantly, almost none of the acreage converted was Prime crop land.

When Hawaii’s Land Use Law was first enacted, government policymakers recognized that preservation of farmland would have to be balanced against other land use policy objectives such as housing and urban developments needed to sustain economic growth. Statewide, housing for Hawaii residents has proven to be the major competing land use. Such multiple objectives create particular problems where high-quality agricultural land is prime for urbanized activities as well. Based on the petitions submitted to the LUC, this situation is more prevalent on Oahu and Kauai. In recent years the LUC has faced mounting criticism that it has caused Hawaii’s housing problems by limiting the land available for new residential developments. Our findings provide little direct support for this charge.

Since 1975, LUC reclassifications of agricultural land to the Urban District have generally followed variations in the acreage requested by petitioners. The latter have fluctuated over time with economic conditions and, perhaps more importantly, public attitudes and government policies toward economic growth. Since the recession in the early 1980s, the U.S. and Hawaii state economies have experienced a relatively high rate of growth, which has been viewed more favorably than in the previous decade. This together with the recovery from a slump in Hawaii housing markets has stimulated petitions to convert more and larger tracts of farmland to urban purposes. The LUC has approved these requests at a fairly high rate, which may have induced even more petitions to be submitted. Given the severity of the housing shortage and current state and county government policies, one can expect the accelerated rate of conversions to continue in the near future with broad public support.

Our results do indicate, however, that the LUC may not be giving due consideration to the quality of farmland converted, particularly the impacts on individual islands. In the aggregate, the loss of prime land so far is too small to jeopardize the state goal of maintaining a degree of local self-sufficiency in food production. But protection of agricultural land serves other policy objectives by preserving open green spaces, alternative economic opportunities, and traditional rural lifestyles—objectives which are important on an island-by-island basis. With its large population, urbanization of prime farmland on Oahu may simply reflect the limited supply of other lands suitable for urban development. It is doubtful that the same can be said about Kauai, for which the LUC has continued to approve nearly all the area requested by developers.
ACKNOWLEDGEMENT

We want to extend our appreciation to the staff at the Honolulu office of the Hawaii Land Use Commission for their assistance in collecting the data.

LITERATURE CITED


Table 1. Area and net change in Agricultural District lands, 1975-89.

<table>
<thead>
<tr>
<th>Island</th>
<th>1975</th>
<th>1989</th>
<th>Net Change</th>
<th>Relative Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hawaii</td>
<td>1,228.8</td>
<td>1,226.7</td>
<td>-2,052</td>
<td>-0.2%</td>
</tr>
<tr>
<td>Kauai</td>
<td>144.7</td>
<td>141.3</td>
<td>-3,436</td>
<td>-2.4</td>
</tr>
<tr>
<td>Lanai</td>
<td>47.2</td>
<td>47.2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Maui</td>
<td>253.2</td>
<td>251.0</td>
<td>-2,266</td>
<td>-0.9</td>
</tr>
<tr>
<td>Molokai</td>
<td>111.8</td>
<td>111.6</td>
<td>-201</td>
<td>-0.2</td>
</tr>
<tr>
<td>Niihau</td>
<td>45.7</td>
<td>45.7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Oahu</td>
<td>145.2</td>
<td>135.8</td>
<td>-9,410</td>
<td>-6.5</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,976.6</strong></td>
<td><strong>1,959.3</strong></td>
<td><strong>-17,365</strong></td>
<td><strong>-0.9</strong></td>
</tr>
</tbody>
</table>

a Net change as a percentage of 1975 acreage.
b May not add up due to rounding.

Table 2. Petitions and area requested versus approved by the Land Use Commission for reclassification from the Agricultural to the Urban District, 1975-89.

<table>
<thead>
<tr>
<th>Island</th>
<th>PETITIONSa</th>
<th>AREAa</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Request</td>
<td>Approved</td>
</tr>
<tr>
<td></td>
<td>number</td>
<td>percent</td>
</tr>
<tr>
<td>Hawaii</td>
<td>55</td>
<td>82%</td>
</tr>
<tr>
<td>Kauai</td>
<td>39</td>
<td>85</td>
</tr>
<tr>
<td>Maui &amp; Molokai</td>
<td>33</td>
<td>82</td>
</tr>
<tr>
<td>Oahu</td>
<td>35</td>
<td>68</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>162</strong></td>
<td><strong>80</strong></td>
</tr>
</tbody>
</table>

a Excludes applications still pending decision in March 1989.
Figure 1. Total area reclassified out of the Agricultural District, 1975-1989.

Figure 2. ALISH (Agricultural Lands of Importance to the State of Hawaii) rating of land reclassified from the Agricultural to the Urban District, 1975-1989.
Figure 3. Agricultural use intensity at petition time of land reclassified from the Agricultural to the Urban District, 1975-1989.

Figure 4. Proposed use at petition time of land reclassified from the Agricultural to the Urban District, 1975-1989.