

HOHOKAM RESOURCE CONSERVATION & DEVELOPMENT AREA

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"LESA"

A LAND EVALUATION AND SITE
ASSESSMENT SYSTEM

DEVELOPED BY USDA

SOIL CONSERVATION SERVICE



ASSISTED BY U. S. DEPARTMENT OF AGRICULTURE AND OTHER COOPERATING AGENCIES
PHOENIX, ARIZONA

A640-903



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RC&D AREA OFFICE

2821 N. 33rd Ave., B-2, Phoenix, AZ 85009

Phone: (602) 261-6054

"LESA"

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PART I

AN OVERVIEW

A LAND EVALUATION AND SITE ASSESSMENT SYSTEM

DEVELOPED BY USDA

SOIL CONSERVATION SERVICE

An Overview

Prepared by: Bart Ambrose
USDA Soil Conservation Service
Phoenix, AZ
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Our country is growing - growing in many ways. In fact, the National Agricultural Lands Study (NALS) estimated that as much as 3 million acres of non-urban land is being developed each year to make way for our growth. Perhaps a million acres of that total is prime cropland.

Maricopa County has participated in this growth in a big way. The county's planning staff has estimated that some 100 sections of irrigated cropland has been developed for non-crop uses in the ten year period from 1972 to 1982.

To put that figure into perspective, consider this brief analysis: 100 sections is 64,000 acres - That's roughly equivalent to developing all of the present-day cropland lorth of the Gila River from Jackrabbit Trail to the Hassayampa River. That much land could produce 138,000 bales of cotton in a season - worth perhaps 45 million dollars at today's prices - or the equivalent of over 45 million 100% cotton jeans. Or it might produce 300,000 tons of wheat, or $\frac{1}{2}$ million tons of hay, or a great many other things.

The "LESA" system is a new method for evaluating growth with an eye to maintaining the productivity of our irrigated lands for as long as possible. The system has two parts: A land evaluation which determines the quality of land for agricultural uses, based on soil surveys, and a site assessment to consider the area's agricultural viability as it is affected by other factors.

The objective of the LESA approach is to provide a tool to aid local decision-makers in planning for orderly growth. The system's development is localized - It is developed at the level at which it will be used, and it is developed by local work groups. We suggest a working committee for each part of the process.

The design of the system is "also oriented to local use - The land evaluation is based on existing knowledge as contained in published and on-going soil surveys. This data is consistent from site to site, it is flexible, and it is technically defensible.

The system can be used in many ways. As a land use planning tool it gives a sound basis for making decisions about where and when changes should occur. It can be used as a means for structuring tax assessments on agricultural lands, or as an additional tool in planning for water and resource projects such as Rio Salado and distribution systems for the Central Arizona Project.

Where agricultural districts are used, LESA can provide a basis for determining minimum economic lot sizes - a means of controlling subdivisions into uneconomic production units. Public utility and transportation systems can be planned more effectively if the long term management of cropland is part of the criteria. There are many other applications for LESA that may fit an area's needs.

As mentioned earlier, LESA has two parts - a land evaluation and a site assessment. The cropland evaluation is based on several factors.

An analysis of soil productivity provides a basis for comparing different sites in terms of their relative value for crop production. In other words, the best crop-producing soils are compared to the worst.

This soil potential comparison is based on the estimated yield data contained in the soil survey publications. This information was gathered from growers at the time the soils were surveyed.

Other factors considered are the land capability classification, which classifies soils into seven groupings of productivity and management limitations, and lands which might be designated as important farmland, such as those which might be particularly well suited to citrus production. Again, we suggest that a local committee be utilized to carry out the land evaluation phase.

The site assessment phase should also be done by a local work group. Initially, the site assessment involves gathering together all pertinent data that will be useful in the process, such as comprehensive plans, population projections, and land use data. The committee then determines which factors to use in the assessment. The factors are weighted according to their importance.

The percentage of an area currently in agriculture is an obvious starting point. Whether the area is predominantly farmland, or already in the process of land use conversions will surely have an impact on the site's viability. Adjacent land uses also can be considered as a separate factor, if needed.

The support facilities which make up the agri-business infrastructure should be a consideration in the area's long term viability for agriculture.

The need for additional urban land would be an important consideration, as would the availability of less productive agricultural lands. The urban lands legislation concerning state trust lands would have a significant impact on this factor.

Compatibility with surrounding uses could be an important factor, as we have learned in recent years with conflicts over farm chemical uses and odors from large-scale livestock operations.

The distance to a city, and its services and supplies, might be important in considering a land use change. Transportation systems are important to farms as well as housing subdivisions - accessibility, cost, and environmental considerations might all play a role in considering a transportation factor.

Environmental and cultural influences can be very important - such things as soil suitability for septic systems and flood hazards to intensive developments can be built into the system. Historic sites and other cultural considerations might also be included. Compatibility with adopted comprehensive plans would likely be a heavily weighted factor, perhaps even the most important of the considerations.

These factors, and others that may be appropriate, combine with a soil-based land evaluation to make up the "LESA" system. It is a new way of Addressing an old concern.

Again, "LESA" is a tool to aid decision-makers in planning for land use, as well as a means that can be used to help implement planning decisions.

It has the advantages of being developed at the level at which it will be used, and it is based on existing knowledge. It is a flexible system which can be fine tuned to local needs, and it can be applied consistently from case to case.

"LESA" can be an important tool in helping to shape Maricopa County's future. It is entirely a matter of choice to the people and government of Maricopa County to use, or not use, the system. The Soil Conservation Service, through the Hohokam Resource Conservation and Development Area organization, stands ready to provide you with our technical expertise in developing your program, should you decide to do so.

PART II

THE "LESA" SYSTEM

AGRICULTURAL LAND EVALUATION AND SITE ASSESSMENT
SYSTEM

PART I - LAND EVALUATION

- DETERMINES THE QUALITY OF LAND FOR AGRICULTURAL USES BASED ON SOIL SURVEYS

PART II - SITE ASSESSMENT

- ASSESS SITES OR AREAS OF LAND FOR AGRICULTURAL VIABILITY
- CONSIDERS ALL FACTORS INFLUENCING THE SITE, IN ADDITION TO SOILS

OBJECTIVES OF THE SYSTEM

- FACILITATE PROTECTION OF FARMLAND BY
DECISIONMAKERS, INCLUDING LANDHOLDERS,
DEVELOPERS, STATE AND LOCAL PLANNERS,
AND GOVERNING OFFICIALS

- IMPLEMENT NATIONAL AND STATE FARMLAND
PROTECTION POLICIES

DEVELOPMENT OF SYSTEM

- SYSTEM IS DEVELOPED AT THE LEVEL AT WHICH IT WILL BE USED.
- A LOCAL WORK GROUP IS ORGANIZED TO FACILITATE THE DEVELOPMENT OF THE SYSTEM.
- THE SYSTEM IS A TOOL TO AID DECISIONMAKERS, BUT IT DOES NOT TAKE AWAY THE POWER OF LOCAL OFFICIALS TO MAKE LAND USE DECISIONS.

SYSTEM DESIGN

1. DEFENSIBLE
2. APPLIED CONSISTENTLY FROM CASE TO CASE
3. FLEXIBLE TO ACCOMMODATE DIFFERENCES AMONG STATES, AREAS, OR COUNTIES

4. BASED ON EXISTING KNOWLEDGE
5. PROTECTS THE INTEGRITY OF NATIONAL LAND EVALUATION AND CLASSIFICATION SYSTEMS

USES OF THE SYSTEM

1. DETERMINE APPROPRIATE USE OF STATE OR FEDERAL FUNDS WHERE IMPORTANT FARMLAND IS INVOLVED.
2. LAND USE PLANNING
3. AGRICULTURAL SITE AND AREA VIABILITY ASSESSMENT
4. AGRICULTURAL LAND TAX ASSESSMENT
5. PURCHASE AND TRANSFER OF DEVELOPMENT RIGHTS
6. ENVIRONMENTAL IMPACT ASSESSMENTS AS THEY RELATE TO AGRICULTURAL LAND
7. WATER AND NATURAL RESOURCE PROJECT PLANNING
8. PLANNING OF SEWAGE, WATER, AND TRANSPORTATION SYSTEMS.
9. PLANNING AGRICULTURAL DISTRICTS
10. IMPLEMENTATION OF FARMLAND PROTECTION POLICIES AND REGULATIONS
11. DETERMINATION OF SIZE OF FARM UNITS TO BE INCLUDED IN AGRICULTURAL PROGRAMS
12. DETERMINATION OF MINIMUM LOT SIZE IN AGRICULTURAL DISTRICTS

IMPLEMENTATION

LOCAL COMMITTEES

PART I - LAND EVALUATION

1. DISTRICT CONSERVATIONIST - COORDINATOR
 - A. 'SOIL SCIENTIST'
 - B. ASSISTANCE FROM AREA, STATE, NTC STAFF AS NEEDED
2. COUNTY PLANNER'
3. EXTENSION ADVISOR '
4. SWCD BOARD REPRESENTATIVE '
5. ACADEMIC PEOPLE
6. ANYONE WITH KNOWLEDGE OF SOILS AND AGRICULTURE IN THE AREA

IMPLEMENTATION

LOCAL COMMITTEES

PART II - SITE ASSESSMENT FACTORS

1. COUNTY PLANNER - COORDINATOR
2. DISTRICT CONSERVATIONIST
3. MEMBER OF COUNTY BOARD OR PLANNING COMMISSION
4. REALTOR AND/OR DEVELOPER
5. ANYONE WHO HAS AN INTEREST AND KNOWLEDGE AT THE LOCAL LEVEL ON LAND USE PLANNING.

THESE TWO COMMITTEES MUST COORDINATE WITH EACH OTHER. THEY MUST UNDERSTAND HOW EACH PART OF THE SYSTEM WAS DEVELOPED AND HOW THE PARTS FIT TOGETHER.

PART III

LAND EVALUATION

SAMPLES FROM SOIL SURVEY DATA
MARICOPA COUNTY, CENTRAL PART

AGRICULTURAL EVALUATION WORKSHEET #1

6-82

List of Soil Series and Evaluations

Sheet 1 of 3

County and State Maricopa, Central Part, Arizona

MLRA 40

Indicator Crop(s) Cotton Lint

Climatic "C" factor 50

Minimum required AWC without irrigation 12

Temperature regime Hyperthermic

Minimum required AWC with irrigation 4

Moisture regime Aridic

Irrigation water available: Yes

No

Map Symbol	Soil Series	Slope	Land Cap. Class & Subclass	Important Farmland Determination	Produc. Ind. Soil Potent.		Acres		Agriculture
					Local	SCS-5	No.	%	
1	2	3	4	5	6	7	8	9	10
Ao	Avondale	0-1	I	Prime where irr.		1250	22,045	3.8	1
Es	Estrella	0-1	I	" " "		1300	23,152	4.0	1
GgA	Gilman	0-1	I	" " "		1600	101,777	17.6	1
Gr,Gt	Glenbar	0-1	I	" " "		1800	24,166	4.2	1
Lb,LcA Lc	Laveen	0-1	I	" " "		1300	102,313	17.7	1
Mo,Mp,Mr	Mohall	0-1	I	" " "		1500	53,838	9.3	1
Tx	Trix	0-1	I	" " "		1100	4,449	0.8	1
Tu,Tw	Tucson	0-1	I	" " "		1100	10,984	1.9	1
Va,Vc	Valencia	0-1	I	" " "		1250	16,725	2.9	1
Aa	Agualt	0-1	IIs7	" " "		1250	8,059	1.4	2
AbA,AdA	Antho	0-1	IIs4	" " "		1550	38,562	6.7	2
An	Avonda	0-1	IIs7	" " "		900	1,842	0.3	2
Cp	Coolidge	0-1	IIs7	" " "		1100	14,023	2.4	2
Pa,PeA	Perryville	0-1	IIs7	" " "		900	9,351	1.6	2
RaA,RbA	Rillito	0-1	IIs6	" " "		1000	10,006	1.7	2
Ta	Toltec	0-1	IIs7	" " "		950	484	0.1	2
Te,TfA, Tg,Th, Tra	Wintersburg	0-1	IIs3	" " "		1050	1,378	0.2	2

DESIGN OF LAND EVALUATION FOR AREA
MARICOPA COUNTY, CENTRAL PART, ARIZONA

JUNE 1982

AGRICULTURAL GROUP	LAND CAPABILITY	IMPORTANT FARMLAND	POTENTIAL OR PRODUCTIVITY	PERCENT	ACRES	RELATIVE VALUE
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	I	PRIME WHERE IRRIGATED	1100 - 1800	62.3	359,449	100
2	II s3,4,6,7	PRIME WHERE IRRIGATED	900 - 1550	17.0	98,666	90
3	III s3	PRIME WHERE IRRIGATED	1100 - 1900	1.8	9,978	87
5	II e1,4,6,7	PRIME WHERE IRRIGATED	750 - 1300	2.1	12,075	77
6	II s9	ADD. WHERE IRR.	800 - 1110	4.7	26,869	67
7	III s7	" " "	750 - 900	5.3	30,685	60
8	III s9	" " "	700 - 900	2.9	16,647	57
10	IV s9	" " "	800 - 900	0.6	3,314	53
11	IV s7	" " "	600 - 750	3.3	19,049	47
12	IV s5	" " "	450	0.1	442	30

-15-

1/ THE AGRICULTURAL GROUPS ARE NOT NUMBERED CONSECUTIVELY, BECAUSE THE GROUPING IS COUNTYWIDE AND NOT ALL THE AGRICULTURAL GROUPS IN THE COUNTY ARE REPRESENTED IN THIS SURVEY AREA.

DETERMINING RELATIVE VALUE
 MARICOPA COUNTY, CENTRAL PART,

June 1982

ARIZONA

AGRICULTURAL GROUP	ADJUSTED YIELD FOR THE GROUP DIVIDED BY THE HIGHEST ADJUSTED YIELD	PRODUCT OF RELATIVE YIELD	TIMES 100	RELATIVE VALUE
(1)	(2)	(3)	(4)	(5)
1	1500	1	100	100
2	1350	.9	100	90
3	1300	.87	100	87
5	1150	.77	100	77
6	1000	.67	100	67
7	900	.60	100	60
8	850	.57	100	57
10	800	.53	100	53
11	700	.47	100	47
12	450	.3	100	30

PART IV

SITE ASSESSMENT

SITE ASSESSMENT

STEP 1

ORGANIZE COMMITTEE

1. LOCAL PLANNER
2. EXTENSION AGENT
3. NRCD OFFICIALS
4. CONSERVATION GROUPS
5. ELECTED OFFICIALS
6. SCS DC
7. OTHERS

STEP 2

ASSEMBLE DATA

1. COMPREHENSIVE PLAN
2. MAPS
 - a. TOPOG
 - b. POPULATION DISTRIBUTION
 - c. NATURAL RESOURCE CONDITIONS
 - d. ETC.
3. LAND USE DATA
 - a. LOCATION, CAPACITY, CONDITION OF
 1. SCHOOLS
 2. LIBRARIES
 3. RECREATION AREAS
 4. ETC.
4. LAND USE REGULATIONS
5. FARMLAND PROTECTION POLICIES
6. SEWAGE AND WATER TRANSPORTATION FACILITIES
EXISTING AND PROPOSED

STEP 3

DETERMINE ITEMS TO BE CONSIDERED IN FARMLAND
PROTECTION

- CONSIDERS:

% OF AREA IN AGRICULTURE

SIZE OF SITE

AGRICULTURAL INFRASTRUCTURE

LAND USE REGULATIONS

AVAILABILITY OF NONFARMLAND AS AN ALTERNATE SITE

NEED FOR ADDITIONAL URBAN LAND

COMPATIBILITY WITH COMPREHENSIVE PLANS

DISTANCE TO CITY OR URBAN BUILT UP AREA

DISTANCE TO WATER, SEWER

INVESTMENTS IN URBAN DEVELOPMENT

PUBLIC TRANSPORTATION

ENVIRONMENTAL FACTORS

RESPONSIBILITY OF LOCAL GOVERNMENT

AGRICULTURAL EVALUATION WORKSHEET # 6
SITE ASSESSMENT - ADJUSTMENT OF LAND EVALUATION FACTORS

COUNTY OR TOWNSHIP

	(1) AGRICULTURAL GROUP
	(2) RELATIVE VALUE WITHOUT IMPROVEMENTS
	(3) DRAINAGE
	(4) IRRIGATION
	(5) EROSION CONTROL
	(6) WATER MANAGEMENT
	(7) FLOOD PROTECTION
	(8) ELEVATION
	(9) CLIMATE
	(10) OTHERS
	(11) OTHERS
	(12) TOTAL VALUE FACTOR
	(13) TOTAL VALUE PERMITTED
-21-	(14) RELATIVE VALUE TO BE USED

AGRICULTURAL EVALUATION WORKSHEET # 7

AVERAGE SITE RELATIVE VALUE

_____ COUNTY OR TOWNSHIP

AGRICULTURAL GROUP	RELATIVE VALUE FOR EACH GROUP	NUMBER OF ACRES IN SITE FOR GROUP	PRODUCT OF RELATIVE VALUE AND NUMBER OF ACRES
(1)	(2)	(3)	(4)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

AVERAGE SITE VALUE

**PRODUCT OF RELATIVE VALUE AND ACRES
ACRES IN SITE**

AGRICULTURAL EVALUATION WORKSHEET # 8
 SITE VIABILITY ASSESSMENT FACTORS
 COUNTY OR TOWNSHIP

10	(1) AGRICULTURAL GROUP
9	(2) VALUE FACTOR WITH IMPROVEMENT
8	(3) PERCENT OF AREA IN AGRICULTURE
7	(4) LAND USE ADJACENT TO SITE
6	(5) SIZE OF FARM
5	(6) AGRICULTURAL SUPPORT SYSTEM
4	(7) LAND USE REGULATIONS
3	(8) NON-AG LAND AVAILABLE
2	(9) NEED FOR ADDITIONAL URBAN LAND
1	(10) COMPATIBLE WITH COMPREH. PLAN
	(11) DISTANCE TO URBAN AREA
	(12) MUNICIPAL WATER SYSTEM
	(13) MUNICIPAL SANITARY SYSTEM
	(14) INVESTMENTS FOR URBAN DEVEL.
	(15) TRANSPORTATION
	(16) COMPAT. W/ SURROUNDING USE
	(17) ENVIRONMENTAL FACTORS
	(18) OTHERS
	(19) TOTAL SITE FACTORS
	(20) SOIL PLUS SITE

AGRICULTURAL SITE ASSESSMENT SYSTEM FOR PROPOSED LAND USE CONVERSIONS

(3) PERCENT OF AREA IN AGRICULTURE WITHIN 1 MILE (WEIGHT 1-10)

- 10 - 95 PERCENT OF AREA IN AGRICULTURE
- - 50 PERCENT OF AREA IN AGRICULTURE
- 0 - 10 PERCENT OF AREA IN AGRICULTURE

(4) LAND IN AGRICULTURE ADJACENT TO SITE (WEIGHT 1-10)

- 10 - ALL SIDES OF SITE IN AGRICULTURE
- - ONE SIDE OF SITE ADJACENT TO NONAGRICULTURAL LAND
- - TWO SIDES OF SITE ADJACENT TO NONAGRICULTURAL LAND
- - THREE SIDES OF SITE ADJACENT TO NONAGRICULTURAL LAND
- 0 - THE SITE IS SURROUNDED BY NONAGRICULTURAL LAND

(5) SIZE OF SITE OR FARM (BASED ON NEEDED SIZE UNIT TO PERMIT FEASIBLE FARM OPERATION) (WEIGHT 1-10)

- 10 - 100 ACRES OR MORE
- - 75-99 ACRES
- - 50-74 ACRES
- - 40-49 ACRES
- - 30-39 ACRES
- - 20-29 ACRES
- - 10-19 ACRES
- 0 - LESS THAN 10 ACRES

(6) AGRICULTURAL SUPPORT SYSTEM/SERVICES

- 10 - SUPPORT SYSTEM PRESENT
- - SOME LIMITATION ON SUPPORT SYSTEM
- 0 - SEVERE LIMITATION ON SUPPORT SYSTEM

(7) LAND USE REGULATIONS (WEIGHT 1-10)

- 10 - SITE AND ALL SURROUNDING SIDES ZONED AGRICULTURAL (RIGHT-TO-FARM ZONE OR AGRICULTURAL DISTRICT)
- - SITE ZONED NONAGRICULTURAL OR 1 SIDE NONAGRICULTURAL
- - SITE AND 1 SIDE NONAGRICULTURAL OR SITE AGRICULTURAL AND 3 SIDES NONAGRICULTURAL
- - SITE AND 2 SIDES NONAGRICULTURAL OR SITE AGRICULTURAL AND ALL SIDES NONAGRICULTURAL
- - SITE AND 3 SIDES NONAGRICULTURAL
- 0 - SITE AND ALL SIDES NONAGRICULTURAL

(8) AVAILABILITY OF NONFARM LAND OR LESS PRODUCTIVE LAND AS ALTERNATIVE SITE WITHIN AREA OF CONSIDERATION (WEIGHT 1-10)

- 10 - LARGE AMOUNTS AVAILABLE
- - MEDIUM AMOUNT AVAILABLE
- 0 - NOT AVAILABLE

(9) NEED FOR ADDITIONAL URBAN LAND (WEIGHT 1-10)

(10) COMPATIBILITY WITH COMPREHENSIVE PLAN (WEIGHT 1-10)

- 10 - Yes
- 0 - No

(11) DISTANCE TO CITY OR URBAN BUILT-UP AREA (WEIGHT 1-10)

- 10 - MORE THAN 2 MILES
- - 1 1/2 MILES
- - 1 MILE
- - 1/2 MILE
- - 1/4 MILE
- 0 - ADJACENT

(12) CENTRAL WATER DISTRIBUTION SYSTEM WITH AVAILABLE CAPACITY (WEIGHT 1-10)

- 10 - NO WATER WITHIN 1/4 MILE
- - WATER WITHIN 500 FEET
- 0 - WATER AT SITE

(13) CENTRAL SANITARY SEWERAGE WITH AVAILABLE CAPACITY (WGHT 1-10)

- 10 - NO SEWERAGE LINE WITHIN 1/4 MILE
- - SEWERAGE LINE WITHIN 500 FEET
- 0 - SEWERAGE LINE ADJACENT TO SITE

(14) INVESTMENT FOR URBAN DEVELOPMENT (WEIGHT 1-10)

- 10 - NONE
- - MEDIUM
- 0 - HIGH

(15) TRANSPORTATION (WEIGHT 1-10)

- 10 - NO PUBLIC TRANSPORTATION AVAILABLE TO SITE
- - LIMITED BUS TRANSPORTATION
- 0 - ADEQUATE BUS TRANSPORTATION

(16) COMPATIBILITY OF PROPOSED USE W/ SURROUNDING USE (WEIGHT 1-10)

- 10 - NOT COMPATIBLE
- - SOMEWHAT COMPATIBLE
- 0 - COMPATIBLE

(17) ENVIRONMENT FACTORS (FLOOD PLAINS, WETLANDS, HISTORICAL AREAS, OPEN SPACE, VEGETATION) (WEIGHT 1-10)

- 10 - COMPABILITY WITH AG LAND USE. NOT PROPOSED USE
- 0 - COMPABILITY WITH PROPOSED USE