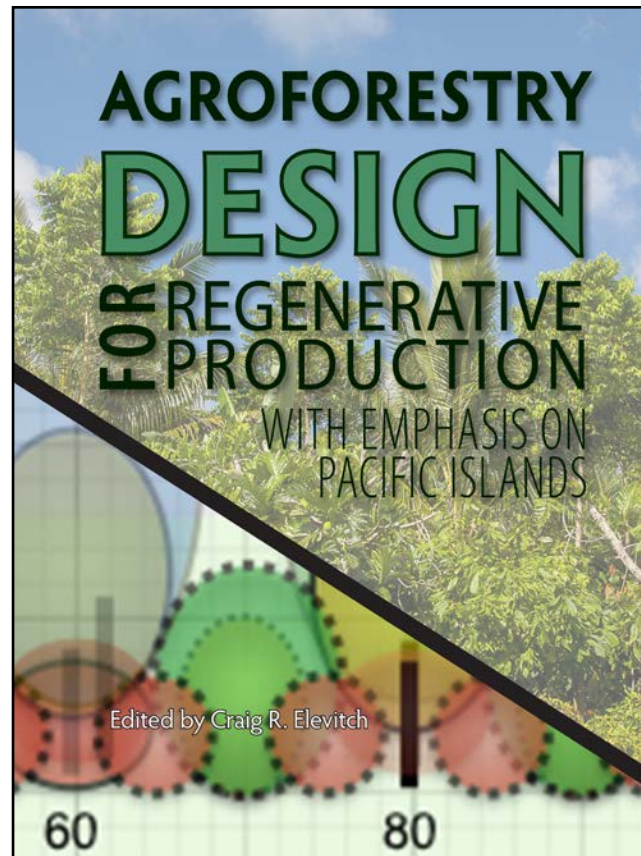


Chapter 3

Goals, Skills, and Site Assessments



By Craig R. Elevitch



Agroforestry Net (<http://agroforestry.org>)

Agroforestry Design for Regenerative Production

Chapter 3. Goals, Skills, and Site Assessments

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AGROFORESTRY NET
TREES OF LIFE, TREES FOR LIFE

Chapter 3. Goals, Skills, and Site Assessments

by Craig R. Elevitch and Neil Logan

By its nature, an agroforestry system includes complex interactions between people, plants, environment, and beyond. To navigate toward successful outcomes, we begin by assessing the underlying goals, skills, and site conditions that form the project foundation. An objective look at these elements, preferably over an extended period of time ranging from months to years, forms the basis for an effective design process. For projects that have a commercial component, a thorough financial and benefits analysis should also be undertaken (Chapter 7). Although it may be tempting to abbreviate or even skip over these assessments, doing so often leads to poor outcomes and wasted time and money.

The goals, skills, and site assessments outlined below are generally based upon a family developing an agroforestry project on their land. They should be taken only as suggestions for how to proceed with these assessments and adapted for each specific project. For example, a community project may phrase these assessments differently from a family.

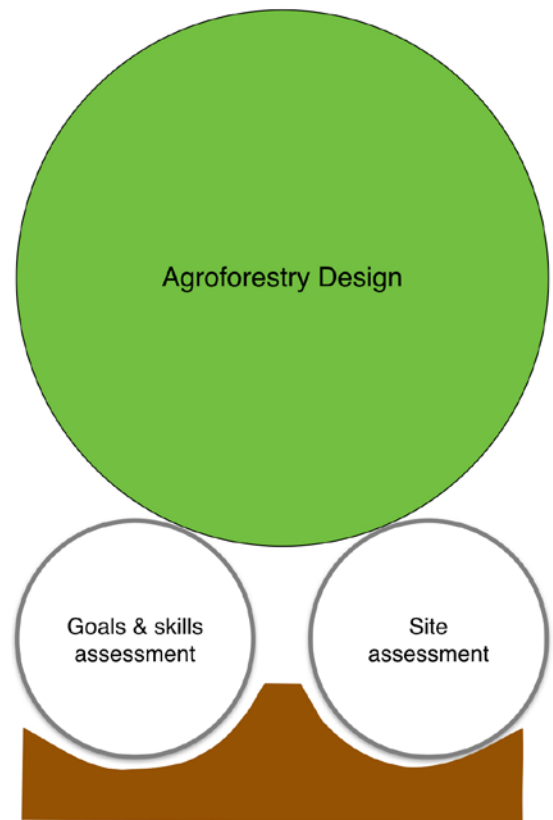


Figure 3.1. Comprehensive goals, skills, and site assessments (in addition to a financial analysis covered in Chapter 7) form the basis for a successful agroforestry design.

PROJECT GOALS AND SKILLS

This part of the assessment gives an overall picture of where you want the project to go and the skills necessary to achieve high priority goals. These are blank worksheets to fill in as desired. An example completed worksheet follows.

Rank in order of importance

| | |
|--|---|
| | Food production: Commercial |
| | Food production: Family and community (subsistence) |
| | Native ecosystem restoration |
| | Timber |
| | Medicine |
| | Natural material crafts |
| | Wildlife habitat |
| | Cultural use |
| | Education about agriculture and conservation |
| | Wilderness awareness |
| | Recreation |
| | Environmental restoration |
| | Agritourism |
| | |

Personal skills assessment

| | Newbie | Hobbyist | Proficient | Expert | Needed for project priorities | Notes |
|--------------------------|--------|----------|------------|--------|-------------------------------|-------|
| Plant identification | | | | | | |
| Plant propagation | | | | | | |
| Growing annual crops | | | | | | |
| Growing trees and shrubs | | | | | | |
| Pruning | | | | | | |
| Seed saving | | | | | | |
| Irrigation | | | | | | |
| Processing foods | | | | | | |
| Hand tools | | | | | | |
| Farm machinery | | | | | | |
| Construction | | | | | | |
| Project management | | | | | | |
| Bookkeeping | | | | | | |
| Financial analysis | | | | | | |
| Recordkeeping | | | | | | |
| Governmental regulations | | | | | | |
| Customer relations | | | | | | |
| Community relations | | | | | | |
| | | | | | | |
| | | | | | | |

Which of your skills supports your project priorities?

Which essential skills will you need to supplement with training and/or other people?

Project purpose (state the overall purpose for the agroforestry project you are planning)

Project objectives (state the outcomes you would like to achieve for this project)

| | |
|------------------------|--|
| short-term objectives | |
| medium-term objectives | |
| long-term objectives | |

Example project goals: Håfa Adai! Farm, Yigo, Guam

Project priorities

| | |
|---|---|
| 4 | Food production: Commercial |
| 2 | Food production: Family and community (subsistence) |
| 3 | Native ecosystem restoration |
| | Timber |
| | Medicine |
| | Natural material crafts |
| | Wildlife habitat |
| | Cultural use |
| 1 | Education about agriculture and conservation |
| | Wilderness awareness |
| | Recreation |
| | Environmental restoration |
| | Agritourism |
| | |
| | |

Personal skills assessment

| | Newbie | Hobbyist | Proficient | Expert | Needed for project priorities | Notes |
|--------------------------|--------|----------|------------|--------|-------------------------------|---------------------------|
| Plant identification | x | | | | | hired botanist |
| Plant propagation | x | | | | x | |
| Growing annual crops | x | | | | x | |
| Growing trees and shrubs | x | | | | x | |
| Pruning | x | | | | x | |
| Seed saving | x | | | | x | would like to share seeds |
| Irrigation | x | | | | x | |
| Processing foods | x | | | | | |
| Hand tools | x | | | | x | need skilled workers |
| Farm machinery | x | | | | | |
| Construction | x | | | | x | |
| Project management | | | | x | x | |
| Bookkeeping | | | x | | x | |
| Financial analysis | | | x | | x | |
| Recordkeeping | | | x | | x | |
| Governmental regulations | | | x | | x | |
| Customer relations | | | x | | | |
| Community relations | | | x | | x | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Which of your skills support your project priorities?

Organizational skills are my strength, which support project planning and implementation management.

Which essential skills will you need to supplement with training and/or other people?

Clearly, on-the-ground skills are essential to the success of this project and must be learned or hired in.

Project purpose (State the overall purpose for the agroforestry project you are planning):

To develop an agroforestry project for economically viable and ecologically regenerative agriculture based on a thorough understanding of the soil conditions and terrain, location of native plants, and other environmental conditions.

Project objectives (state the outcomes you would like to achieve for this project)

| | |
|------------------------|--|
| short-term objectives | We would very much like to produce food for local consumption, both to sell and give away to needy people. |
| medium-term objectives | To conserve native species and habitat while also producing food. |
| long-term objectives | Serve as a model farm for others, educate the general public about caring for nature in farming, create a place to explore nature. |

SITE ASSESSMENT

A thorough evaluation of site characteristics reveals the capabilities and limitations of the site and is therefore an essential part of the planning process. The assessment provides important information related to species selection, soils, water, roads, pathways, and structures, making it critical for an effective plan. Completing a site evaluation often reveals important planning considerations that would not normally come to mind.

Site assessment form

Site name:

| | |
|--|--|
| General site description | |
| Property maps (location, dimensions, etc.) | |
| Topography | |
| Elevation | |

| | |
|--|--|
| Wind (prevalent direction, speed) | |
| Temperatures | |
| Soil | |
| Annual rainfall | |
| Weather (historic averages, extreme events) | |
| History of uses | |
| Description of present condition | |
| Existing vegetation/ cover types and health | |
| Vegetation species list | |
| Water resources | |
| Historical resources | |

| | |
|--|--|
| Cultural resources | |
| Existing wildlife and their impact | |
| Threatened and endangered species | |
| Recreational and aesthetic values | |
| Existing roads and access | |
| Utilities (electricity, cable, phone) | |
| Zoning restrictions | |
| Environmental threats (disease, pests, etc.) | |
| Activities on neighboring properties | |
| Other | |

Example site assessment for Håfa Adai! Farm located at Yigo, Guam

| | |
|--|---|
| <p>General site description</p> | <p>This 3-acre parcel has shallow, limestone soils with native vegetation invaded by a range of exotic species.</p> |
| <p>Property maps (location, dimensions, etc.)</p> | <div data-bbox="651 285 1263 724" data-label="Image"> </div> <p>The 3-acre site measures approximately 360 ft × 360 ft and is located in Mataguac, Yigo, Guam, about 1/2 mile south of Andersen Airforce Base.</p> |
| <p>Topography</p> | <p>Slopes are 0–15% with the highest point in the northern corner and lowest in the southern corner. There are no prominent valleys or ridges, meaning that the property is more or less evenly sloped throughout.</p> |
| <p>Elevation</p> | <p>The elevation is 575–610 ft (175–186 m) above sea level.</p> |
| <p>Wind</p> | <p>Average wind speed is 12–15 mph in an westerly to southwesterly direction (windfinder.com). Wind probability is lowest in July–August (≈34%) and highest in January–March (77%).</p> |
| <p>Temperatures</p> | <p>Average temperatures are 79–82°F</p> |
| <p>Soil</p> | <p>The Guam series consists of well drained soils with moderately rapid permeability that are very shallow to limestone bedrock. They are on uplifted limestone plateaus, and formed in sediments that overlie porous coralline limestone. Slopes range from 0 to 15%. The mean annual precipitation is about 90 inches, and the mean annual temperature is about 79°F.</p> <p>For the soil type on this site, Guam cobbly clay loam, the typical profile is:</p> <ul style="list-style-type: none"> A: 0 to 2 inches: cobbly clay loam Bw: 2 to 8 inches: gravelly clay loam 2R: 8 to 12 inches: bedrock <p>Soil map with map unit symbols</p> <div data-bbox="548 1493 1365 1934" data-label="Image"> </div> |

| | | | | |
|--|---|-------------------------------------|---------------------|---|
| Soil (continued) | Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
| | 25 | Guam cobbly clay loam, 3–7% slopes | 0.8 | 26.2% |
| | 26 | Guam cobbly clay loam, 7–15% slopes | 2.2 | 73.8% |
| | Totals for Area of Interest | | 3.0 | 100.0% |
| | <p>A separate soils assessment report includes results of soil analyses taken from 49 sampling holes distributed throughout the property. The sample results are summarized in the table below.</p> <p>Summary of the soil analysis results.</p> | | | |
| | Location on site | Top | Evaluation | Interpretation |
| | pH: (1:1 slurry)* | 7.8 | high | Higher than desired, but not likely to be a problem |
| | Organic matter %** | 13 | sufficient | Levels are adequate and should be steadily increased for organic agriculture. |
| | Phosphorus (P), ppm* | 8.4 | very low | Additional P is needed. |
| | Potassium (K), ppm* | 42 | very low | Additional K is needed. |
| | Calcium (Ca), ppm* | 11118 | very high | Nutrient imbalances, particularly micronutrients. |
| | Magnesium (Mg), ppm* | 332 | very low | Additional Mg is needed. |
| | * Analysis done at the University of Hawai'i Agricultural Diagnostic Service Center. | | | |
| | ** Analysis done at University of Guam Soil & Plant Testing Laboratory | | | |
| Annual rainfall | Average annual rainfall is about 100 in (2500 mm). Historically, about 70% of the total annual rainfall falls during the wet season (July–December) with the remainder falling during the dry season (January–June). | | | |
| Weather (historic averages, extreme events) | According to USGS, “The heaviest rainfall is usually associated with the passage of typhoons during the wet season but only about 12 percent of average annual rainfall can be attributed to typhoons passing within 180 nautical mi of Guam (Lander, 1994). Exceptionally dry years recur about once every 4 years in correlation with episodes of El Niño Southern Oscillation (ENSO) in the Pacific (Lander, 1994).” | | | |
| History of uses | Some farming of annual crops has been done in the northern 1/5 of the property periodically over the past 10–20 years. | | | |
| Description of present condition | Much of the site is native forest, colonized lightly to heavily with non-native species many of which are considered invasive. | | | |
| Existing vegetation/cover types and health | Inspection of the site by several experts revealed that the site has a substantial cover of native species with exception of the northern 1/5 of the property, which has been previously cleared. The exotic tree that is most dominant on the site is alhaon manila (<i>Vitex parviflora</i>). An extensive vegetation survey was carried out that documented the position, size, and health of every native tree, which is detailed in a separate report. Of 640 observation points made of native species, about 160 had trees that showed wind damage including tops blown out, branches broken, leaning, or blow over. | | | |

| | | |
|---|---|--|
| Species list | <p>Agatelang (<i>Eugenia palumbis</i>) endemic Ahgao (<i>Premna obtusifolia</i>) native Ahgaon manila (<i>Vitex parviflora</i>), exotic <i>Aidia racemosa</i> Alum (<i>Melanolepis multiglandulosa</i> var. <i>glabrata</i>) native Aplokating (<i>Psychotria mariana</i>) endemic Atoto (<i>Eugenia thompsonii</i>) endemic Chosgo/Abas duendes (<i>Glochidion marianum</i>) endemic Coconut (<i>Cocos nucifera</i>), exotic Dokdok (<i>Artocarpus mariannensis</i>) endemic Fagot (<i>Neisosperma obtusifolia</i>) native Ferns <i>Phymtodes</i>, <i>Microsorium</i>, <i>Asplenium</i> Fianiti, false rattan (<i>Flagellaria indica</i>) native Hotda (<i>Ficus tinctoria</i>) native Iba' (<i>Phyllanthus acidus/oxalis</i>)</p> | <p>Ifit (<i>Intsia bijuga</i>) native Kafu' (<i>Pandanus tectorius</i>) native Lada (<i>Morinda citrifolia</i>) native Luluhut (<i>Maytenus thompsonii</i>) endemic Mapunao (<i>Aglaiia mariannensis</i>) endemic Native ixora (<i>Ixora triantha</i>) native Nger (<i>Allophylus ternatus</i>) native Nunu (<i>Ficus prolixa</i>) native Otot (<i>Discocalyx megacarpa</i>) endemic Pago (<i>Hibiscus tiliaceus</i>) native Paipai (<i>Guamia mariannae</i>) endemic Pengua (<i>Macaranga thompsonii</i>) endemic Pupulun aniti (<i>Piper guahamense</i>) endemic Sumak or sumak lada (<i>Aidia cochinchinensis</i> or <i>Tarenna sambucina</i>) native Tangantangan (<i>Leucaena leucocephala</i>) exotic Yoga (<i>Elaeocarpus joga</i>) native</p> |
| Water resources | Guam Waterworks Authority water is available at the southwest corner of the property. No catchment or other water sources are present. | |
| Historical resources | None known. | |
| Cultural resources | None known. | |
| Existing wildlife and their impact | Wildlife is limited. Feral pigs have been reported in the area. | |
| Threatened and endangered species | None known. | |
| Recreational and aesthetic values | With careful removal of invasive species, it is expected that much of the property will allow for establishment of productive agroforests and pathways that meander throughout. | |
| Existing roads and access | A residential unpaved road exists along the western and northern boundaries of the property. | |
| Utilities (electricity, cable, phone) | The nearest utilities are located several hundred feet away from the property. | |
| Zoning restrictions | The property is zoned agricultural. | |
| Environmental threats (disease, pests, etc.) | The biggest threats are weather extremes: typhoons, drought, heavy rains. A range of pests and diseases exists on Guam, see 2017 Index of Plant Diseases In Guam (https://cnas-re.uog.edu/the-2017-index-of-plant-diseases-in-guam-is-now-available/) | |
| Activities on neighboring properties | Light farming, homesteading | |
| Other | <p>Priority concerns about this site:</p> <ul style="list-style-type: none"> • Agricultural theft • Lack of irrigation water • Preservation of rare native habitat | |

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