Land Use Narratives. Stakeholder Draft 1

Timeframe for all scenarios is 2080 to 2099 or 60 to 79 years from present

Scenario 1: Population Attrition

Potential Causes
Cannery shut down.
Increased flooding and degraded freshwater supply drive people to other places.
Lack of economic opportunities reduces population.
External or internal political causes reduces availability of jobs in government sector.

Potential Effects

- Lower populations will result in less agricultural plantations, as there will be less people to feed and less people using the land. Additionally, trends towards westernization/modernization also generally reduce agriculture in favor of imported foods. **GIS manifestation**: randomly selected set of all existing agriculture plantation area goes to vines and or to forest? (*Idea based on interview with ASCC researchers.)*

- Urban boundaries may shrink with shrinking population, existing buildings may be abandoned and revert to natural land-use. **GIS manifestation**: remove outer layer of buildings from all villages replace with secondary scrub forest (*based on forest succession ideas of ASCC researchers*)

- Urban density may also be reduced with shrinking population, existing buildings may be abandoned and revert to natural land-use. **GIS manifestation**: reduce level of development classification for residential areas (*based on interview with Dr. Hattori*)

- Low-lying coastal villages abandoned as communities move inland and/or upslope. **GIS:** Areas experiencing historic flooding changed from urban or developed to secondary scrub forest.

Scenario 2: Economic Boom and Unchecked Growth

Potential Causes

Internet cable brings new jobs
Tourist industry flourishes
Unchecked immigration from outside

Potential Effects

- Expansion of roadway on Assu Plain, and additional sealing of existing dirt roads, construction of new roads in areas where building is feasible. An increase in population could manifest as an increase in land needed for development. The high-elevation mountain top area of Western Tutuila contains some of the last low-slope undeveloped land on the island. ASCC researchers spoke about past proposals to construct a roadway from Aasu to Fagamalo Villages, thereby opening up much of Western Tutuila for development. **GIS manifestation:** Addition of roadway from Aasu to Fagamalo Villages, all areas with a slope of less than (15%) become covered with urbanized land use, road network built between structures. (*based on ASCC researchers interview and interview with Dr. Hattori*)

- Increase in runoff from additional impervious surfaces, and channelization of streams. **GIS manifestation:** If runoff to rainfall ratio method for runoff partionioning is used, increase runoff ratios proportionally to amount of increased urbanization and impermeable surfaces. (*Based on interview with Dr. Hattori*)

- Increased population may result in more land being used for agroforest plantations. Also AS-DOA is encouraging and may subsidize cacao plantations for exports. Most flatter areas on Tutuila have been used for plantations at some point in history. **GIS manifestation**: either use slope map or orthoimage/land use areas of coconut palms to represent areas that could again be converted to agroforest. (*based on ASCC researchers interview and stated push for large farm agricultural exports of the Department of Agriculture)*

- Increased population and economic development may encourage row crop farmers to expand to meet market demands. **GIS manifestation:** since these farms are generally located on Tafuna-Leone Plain, it would be sensible to predict their expansion in this region. Add additional row crop farms in areas where there is currently local agriculture (*based on ASCC researchers interview)*

- Due to low availability of flat land increased population would have to be compressed into existing spaces. DOC and Public Works already note trends in densification of urban areas. **GIS manifestation:** densification of existing urban areas, especially in Tafuna-Leone Plain where much freehold land is located. *(based on interview with DOC and Public Works)*

- Increased hillside urbanization and filling of wetlands. DOC notes that some houses are being built up hillsides, though not many because land is steep. Increased population and land prices will make currently uneconomical building sites more appealing in the future. **GIS manifestation:** Only areas of moderate slope (determine threshold) and adjacent to existing development would be considered. Develop an algorithm to convert lands that meet some development criteria to urban land use. Also, wetland areas in locations viable for building may be converted to urbanized land use *(based on interview with DOC and on interview with Dr. Hattori*)

Scenario 3: Increased population with increased zoning and management

Potential Causes

Scenario predicts increase in population similar to scenario 2
Includes numerous best management projects that could be implemented by regulators including:

- Implementation of stricter and more specific zoning regulations
- Implementation of and regulation of existing special management areas
- Increased infrastructure and stormwater management planning

Potential Effects

- Increased densification on Tafuna Plain, **GIS manifestation:** same as Scenario 2.

- Hillslope development **GIS manifestation:** based on the same algorithm as scenario 2, but only in Pago Harbor area as a special management area, *(note no interview reference for this)*

- Addition of infiltration basins for stormwater management **GIS manifestation:** based on locations provided by (*Dep of Public Works*)

- Malaeimi Valley becomes special management area. **GIS manifestation:** Removal of all road and residential in Malaeimi valley and preservation as special conservation area (*as suggested in MMI valley planning report)*

- Consolidation of agroforestry, based on DOA programs to increase agricultural exports. **GIS manifestation:** Merge smaller agroforest areas into fewer larger ones, keeping same forest land areas as in scenario 2 (*based on ASCC researchers interview)*

- Removal of some urban areas from the worst flood zones **GIS manifestation:** Using FEMA riverine flood maps and NOAA coastal flood hazard maps of coastal areas. Also move all removed urbanization into equivalently densified existing areas. *(based on interview with DOC and Public Works and on interview with Dr. Hattori)*