

R E G U L A T I O N O F

G E O G R A P H I C A R E A S

O F

P A R T I C U L A R C O N C E R N

T O G U A M

REGULATION OF

GEOGRAPHIC AREAS

OF

PARTICULAR CONCERN

TO GUAM

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INTRODUCTION

Definition

Every piece of land has a limit to its ultimate capacity for development. Certain areas, however, are extremely important, if not critical, to the future welfare of the community and require special regulatory control to assure appropriate utilization and maximum environment^y protection. Essential to the physical and cultural development of Guam are areas

1. that provide access to coastal water^s for associated development and facilities,
2. of significant physiographic or geologic ^{features} resources,
3. of high natural productivity of unique, fragile, or natural habitat for living resources,
4. that protect, maintain or replenish Guam's land, water or other natural resources,
5. that have significant hazards detrimental to development and
6. of historic, legendary and archeologic importance.

Scope

Critical areas regulation is not a separate instrument but merely a chapter in the total development book. The planning process of data collection, analysis, problem identification, goals, alternatives, and plan preparation in itself is comprehensive and, if properly conducted, brings together the related elements of planning and development. The current comprehensive planning and regulatory activity of the Bureau of Planning is centered upon four major land use districts: urban, agriculture, rural and conservation. Geographic areas of particular concern may be found in any of the districts. ^{Herein we are} ~~This paper is~~ limited to the compilation and formulation of guidelines to control and promote development for:

1. Mineral Extraction Sites
2. Historic Sites
3. Archeological Sites

4. Scenic Areas and Vistas
5. Flood Plains
6. Aquifer Recharge Areas
7. Noise Impact Zones
8. Seismic and Fault Zones

Regulatory Need

Land use regulations are "protective" rather than "restrictive" if we consider the community as a whole, which we must do, rather than ^{as} an individual. What do the regulations protect? They protect each person's land value by insuring that surrounding uses are compatible. They insure that supporting uses are adequate to serve areas being developed. They insure that satisfactory space is afforded to each use. They insure that infrastructure, access, and public services meet requirements efficiently. The value of land regulations is to provide for many of the needs of the community while protecting the individual's investment in buildings and land and the community's investment in urban services. The use of land in accordance with zoning regulations assumes that such regulations will not be amended to the detriment of such use. Environmental protection goes far beyond pollution control and philosophically is directed to the most beneficial use of land for all the residents and their posterity. A concept of critical areas~~/~~ regulation concerns guidelines for development while protecting limited natural and cultural resources.

Zoning or other land regulations should provide adequate protection, but there is a tendency to consider economic return to individuals of greater importance than a liveable environment to the community. Such thinking has permitted zone changes and variances in conflict with ^{proper} ~~the~~ protection. Economic self-interest has too often been the prime objective of rezoning. Commissions, for example, often have gone along with spot zoning and heavier density in order to help out the developer who paid too much for his land. The community must be considered first as development pressures increase, especially during times of runaway inflation and land speculation.

Legal Basis

A legal basis for planning and land use regulations has long been established by the court. Terminology in regulatory law usually includes the words safety, health, and general welfare of the people. In addition, regulations must have a substantial relation to the comfort and convenience of the community. Restrictive practices are upheld if they are a part of a broadly based planning process. Courts have accepted the idea that zoning is an ongoing process as most communities make very restrictive zones then change in response to specific proposals. The process becomes more important than the original regulations and the real land policy comes to be expressed in the zoning amendment.

A comprehensive plan provides the direction that development takes. Socio-economic needs for the future as well as the present are anticipated with provisions to minimize problems. Selection of land areas to satisfy spatial requirements, standards to indicate quality of service, and goals to establish land use policy are all included in the plan. Regulations to implement the plan should only be the administrative process and a reiteration of development standards. The plan is the foundation for development activities and, although flexible, represents guidelines and a framework within which the complex activities of the community operate.

Prerequisites

Land speculation during the inflationary period from 1967 to 1974 was probably responsible for many rezoning requests. While the risk of speculation investment may warrant a high rate of return, such return may be detrimental to the community as a whole. During such an inflationary period, land values become unrealistic with parcels of land changing hands many times only for quick profit with no investment benefit to Guam. Value of land is dependent upon many factors, i.e., location, site, access, topography, utilities, availability, all of which determine capability. Zoning is also an element of capability and essentially brings together all the elements that indicate the value of a

particular parcel or lot. In most cases, access and utilities are paid for and maintained by public revenue. These same improvements raise the value of the property and serve increased densities permitted by zone changes. For these reasons, it is extremely important that land values include zoning as a basic criteria for assessment. Zone changes for speculation purposes only will be reduced because taxes would be increased. If the changes are for legitimate investment such investment will pay its fair share of taxes. Without zoning criteria as a basic element of taxation, regulation will always be ineffective.

Land values are essentially established by the comprehensive plan, indicating densities and uses permitted for each parcel and the level of services provided at public expense. Certain land owners may be considered fortunate in an economic sense if their parcels are designated for high density of varied activities. A high risk is also a factor in having high density potential and higher taxes are assigned to pay for the level of services necessary for high density. Without these interdependent factors, land assessment and taxation is not equitable and protection is non-existent before regulations can actually be implemented.

In summary, land use regulations to be effective, must reflect socio-economic needs and conditions. A comprehensive plan provides the necessary legal basis for land use regulation. Without equitable taxation, regulations will not provide the ~~protection~~ protection promised to the land owner to pay no more than his fair share for community services.

Land Tenure

Ownership or control of the rights to develop a parcel may take many directions. Fee simple ownership is the most direct, utilizing a willing-buyer, willing-seller approach. Leasehold arrangements have special conditions but essentially permit use for periodic payments. Easements are usually granted for utilities or access and may require an original lump sum payment or may just be granted to acquire the services. Easements may also be for recreational, flowage, safety, scenic, clearance, height, or recharge uses. Rights of use may be purchased either by lump sum or by periodic payments. In many cases, rights of use, such as mineral rights may be retained by a former owner in the event that new discoveries are made.

Eminent Domain

The government has the right to obtain any private land for justifiable public purposes. Of course, just compensation is required and in many cases the courts have to decide what is just compensation. In some situations, the government may only take a portion of a parcel but in doing so may render remaining portions unusable and would have to compensate accordingly. Not all eminent domain is by fee simple as negotiation is usually sufficient for leaseholds, easements, or purchase of development rights. Land for public use would be better controlled by government than upon an individual's whim. Acquisition by the government may be accomplished by many methods stated previously. A comprehensive law is necessary to tie these methods together in one administrative agency also having support of the comprehensive plan. Land exchange, leasehold, easement, development rights, and tax deferral methods should all be employed to bring under governmental control land used for public purposes. Critical areas especially need such control, but without a comprehensive effort in all sectors success is piecemeal, fragmented, and unpredictable.

Density control

Density of development is the most important element in the regulation of land. Many of the factors that determine land value also influence density. Densities may be measured in relation to population, residential or business units, floor area ratio, employment or customers. Cultural needs and acceptance of development types are factors of density as well as the physical capability of land to support development.

Use Designation

Of great importance in land regulation is the designation of use. Each use has its own pattern and mixtures of use indicate potential density and the demand for urban services. Much of the urban design reflects the various uses and the densities permitted. Cultural and economic activities influence quality and quantity of uses. Protection of natural resources or existing cultural conditions affect the capability of a parcel and consequently reduce the variety of uses permitted. Hazardous conditions also limit uses. Critical areas are more difficult to manage from a community viewpoint as the emphasis is on what you may not do rather than what you may do.

Performance Standards

Each use has requirements to assure maximum efficient utilization. Space is a performance standard element that may be reflected in lot size, building coverage, recreation area, building height or yard requirements. Utilities, access and other urban services are also measurable in providing optimum conditions under which uses are operable. Performance standards apply also to land and water protection in limiting uses and densities. Certain techniques such as green belts or cluster development are factors in assuring that adequate standards are maintained for optimum use of a parcel of land while providing a creative and aesthetic design.

Planned Unit Development (PUD)

Where inexpensive land is somewhat removed from the urban scene, a PUD may be created. This development may cover a minimum area of five hectares for commercial development to a minimum of twenty hectares for residential. The developer is required to construct all urban services within the project area and to bring those services as extensions of existing services to the project area. In some instances, the government may contribute in bringing those services to the project area in greater capacities to serve expected development between the existing urban area and the project area.

Planned Unit Development is a technique to permit concentration of buildings and services in a creative manner providing variety and interest to the ultimate consumer. An application of detailed performance standards causes all development to be planned. The subdivision regulations are contradictory to the flexibility of planned development and cut up large parcels to produce lots, not liveable neighborhoods. PUD's do not belong as a section within the subdivision process but rather as the guide to incorporate many aspects of development standards within the total subdivision process.

Transfer of Development Rights (TDR)

A comprehensive plan indicates areas of varying urban densities as well as open space. Although the plan may be perfectly justified, certain land owners will not have the opportunity to develop an urban complex on their land with the high monetary return that usually accompanies such development. With TDR's, to partially compensate for this legal inequality, a developer that is fortunate in having his land identified for additional density must purchase the development rights over a portion of the designated open space and dedicate those rights to the community. In this manner, the owner of the designated open space receives an amount for his land near a par with the land value of designated urban land.

Tax Exemptions

Property taxation is a tool used by many governments to regulate development. As urban development occurs around vacant land the value of the vacant land increases and consequently taxes are increased forcing the owner to develop. If the entire area has been selected for urban expansion through comprehensive planning, and services are made available equally throughout the area, then the government is justified in raising taxes on vacant land. Exemption or reduction of taxes may be used as a means of payment for easements or acquisition of development rights for a particular period. To encourage agriculture, communities may exempt the farmer from payment of taxes as long as he continues to farm the land. Retention of green space in selected areas may also be accomplished by this method. In most cases, the exemption is rather a deferral until the time that the farmer chooses to utilize or sell the land for non-agricultural purposes then payment of accumulated "back-taxes" would be made. The deferral method reduces speculation on a high land value achieved by adjacent urban development and services surrounding the agricultural parcel with only token farming being conducted.

Right of First Purchase

Especially in planned unit developments, certain parcels may be indicated for community facilities such as schools or special parks. Usually in a PUD, a cluster technique is utilized to concentrate open space for parks and playgrounds within residential areas. Such areas are required and not subject to government compensation. School sites, however, due to their extensive nature are planned within the residential complex to reduce the expense of busing and to provide a center for community activity. The government must purchase such a site prior to completion of the PUD. The purchase price should be that of the original cost plus a portion of the cost of improvements. If not purchased at a given time, the developer may utilize the site for further agreed-upon development.

A proportion of the residential units may also be purchased by the government for use by low-income families in accordance with established law and managed by a designated agency. These conditions of project approval contribute to the health, safety, and general welfare of the community.

CATEGORIES OR CRITICAL AREAS

Federal Assistance

Land use planning and regulation is normally a responsibility of local authority. The Federal government, however, has instituted a program at the state level to insure adequate protection of critical areas where local programs are lacking.

~~Although a single jurisdiction, Guam is considered a state for many Federal programs. The current critical land use programs funded in part by the Federal government provides a needed approach for a total land use planning effort.~~

Non-Renewable Resources

Non-renewable resources on Guam are primarily soils and coral. Although competition with other economic activities is responsible for low agricultural output, few areas of deep, fertile soil exist. Therefore, good soils must be protected and correctly managed to assure future production, especially with greater emphasis being placed on a "green revolution" to combat recessions and unemployment and to diversify a limited economic base. Coral has important uses in construction and Guam appears to ^{exist} ~~be in~~ have a sufficient quantity. However, there are only a few areas of high quality coral which should be protected from intrusion as well as managed for greater efficiency with the post-mined land planned for appropriate reuse. One area has been identified for cement production.

Renewable Resources

Renewable resources include flora, fauna, and water. Marine resources are included although, whether land or water, flora and fauna "habitats" are difficult to delineate. The potable water resource is extremely critical being the direct result of localized rainfall and the effectiveness of the principal reservoir, the water "lens," in the northern portion of Guam. This natural reservoir supplies water to the majority of Guam's population and although a series of dams in the south may,

at great expense, match the capacity of the lens, the lens must be protected to permit foreseeable development with appropriate services. Dam construction should proceed for recreation and irrigation purposes, where economically feasible, as a bridge to future water needs.

Historic and landmark sites are normally limited in area and development may proceed around them. Their cultural importance is great and they should become centers of interest with strict protection and appropriate design as part of the community. Archeological, cultural, legendary, and viewpoint sites are included for maximum protection. Developers should be granted increased densities near these areas only if they aid in their protection.

Open Space Recreation

Recreation and scenic areas are an essential part of the total community. Qualities of site may not be as specific as in other critical areas but suitable sites should not be utilized for non-critical activities that can be located in alternative areas. Obviously, competition for uses will occur in many areas and the needs of the community may be satisfied by several alternative areas. Cost of acquisition, extension of services, access, and maintenance must be considered for each alternative selected. In special locations, such as coastal areas, environmental protection efforts may require parcels of land and water to be unused and preserved in a natural state.

Natural Areas

Ecosystems are generally unique wherever located but those that are dissimilar from common types require exceptional techniques for protection. Coral and other marine life are easily disturbed by overfishing and promiscuous collecting. Regeneration is difficult and slow. Life support systems for various birds and animals are also difficult to maintain on an island as small as Guam. There is a constant eroding away of the natural habitat as areas become more accessible and prime

land for urban development diminishes.

Hazardous Areas

Natural hazards areas normally are associated with an abundance of water such as flood plains, swamps, and coastal regions. Seismic areas, steep slopes, and aircraft noise may also cause difficulties to potential developers. Efforts to reduce hazards may be expensive and development of such areas may create secondary problems in adjacent parcels. Protection in these areas is directed to the developer rather than to the land unit itself, although the ultimate consumer needs protection from inadequate development. Most programs utilizing federal or municipal funding to alleviate hazards take a close look at the value of potential damage in relation to the amount of public expenditures.

Mineral Extraction Sites

At present, only three types of surface mining occur on Guam: extraction of high grade coral and limestone, extraction of topsoil and general fill material, and extraction of sand. Sand and high grade coral are in limited supply on Guam and all efforts should be made to protect these areas from competing uses. Conversely, a concentration of existing uses adjacent to these resources are entitled to a certain amount of protection. The following considerations are essential to the land regulations concerning surface mining:

1. Zones of heavy, light, and adjacent use.
2. Minimum parcel sizes.
3. Boundary and road setbacks.
4. Slope control.
5. Pollution control.
6. Continued use and reuse.

Historic and Archeological Sites

For the most part, these areas are comparatively small although the proposed War in the Pacific Park covers an extensive area. Protection is of primary importance, but the study of various aspects of our cultural heritage by all interested people would only be possible if the areas are accessible. Urban development would be enhanced by historic, legendary, and archeological sites by attracting many people. General provisions should include:

1. Minimum parcel size.
2. Accessibility, parking, and utilization.
3. Protection and security.
4. Interpretation.

Scenic Areas and Vistas

Sightseeing usually has more participants than any other form of recreation. The large parcels concerned with scenic and vista areas lend themselves to complementary uses of camping, picnicking, beach activities, and possibly historic and archeological sites. Multiple uses of public land tend to provide greater improvement and security than single uses. Vistas also

require certain considerations of adjacent property. In order to adequately protect and utilize scenic areas and vistas, regulations should include:

1. Accessibility.
2. View protection.
3. Multiple public uses.
4. Adequate space.
5. Public acquisition of development rights.

Hazardous Areas

Airports present two distinct types of hazards, accident and noise, to community development. The United States Air Force has prepared quantitative data concerning hazardous areas in the vicinity of airports and has specifically identified zones of compatibility with selected land uses for the areas affected by Andersen Air Force Base (AAFB) on Guam. Essentially, the development limits suggested by the study should be made part of the regulations affecting geographic areas of particular concern on Guam.

Although noise and accident hazards create a variety of problems, land use controls will be detailed in the areas of:

1. Protective measures
2. Performance standards
3. Specific use control

Seismic and fault zones do not present a clear area of particular concern. While a certain clustering of fault lines can be identified, a broad approach ^{uses} ~~is through~~ informative methods rather than land use regulations. The area of greatest frequency is also the area of greatest development concentration. Deeds should indicate that the property is in an earthquake zone and the building code should include structural requirements to minimize damage. There are no preventative measures that are feasible at this time with the possible exception of not permitting increased densities; therefore, no regulatory measures are proposed ~~in this study.~~

As with many federal programs, a prerequisite for assistance requires regulation of an area. For example, subsidized flood insurance for a community is only possible if flood plains of rivers and streams are regulated. The value of flood plains is evident from history with the location of high population densities taking advantage of the level, fertile land, water, and transportation. Conversely, damage to man's settlement of flood plains has been extensive and costly but still we build upon the remains. Settlement control has advantages over flood control but the value of location on flood plains mandates development regulations to permit urban utilization. Provisions to regulate the use of flood plains include:

1. Reducing Flood Hazards
2. Controlling Development
3. Prevent Obstruction to Floodways
4. Floodproofing and Protective Works
5. Modification of Existing Uses

Aquifer Recharge Areas

While water is a renewable resource, the primary reservoir on Guam, the water lens, is vulnerable to pollution of raw sewage and urban waste runoff. The criticality of this resource is above all others on Guam due to its affect on a large majority of the people. In addition to minimizing pollution, efforts must be made to maximize the natural recharge channels and areas. In addition, provisions should include:

1. Rigid density control.
2. Natural and man-made pollution control.
3. PUD control emphasis.
4. Controlled agricultural use.

Unique Ecosystems

Areas of high natural productivity of unique, fragile or natural habitat for living resources include swamps, mangrove, cliffs, forests, lagoons, or reefs. Minimum disturbance and maximum protection are essential to maintain their special character.

General provisions include:

1. Size and density.
2. Maximum protection against building except for interpretation.
3. Adjacent shoreline, if water-based ecosystem, must provide access and protection.

Chapter _____. Geographic Areas of Particular Concern.

Section _____. Identification.

Areas of unique importance to the development of Guam, such as natural features and resources, cultural landmarks, and hazardous areas, fall within critical areas designation. The zoning map identifies specific types which are treated in these regulations.

Section _____. Purpose.

Technical and population increases have overbalanced the agricultural production of Guam and are straining its resources. These regulations are designed to obtain maximum use of physical, economic, and cultural resources within the framework of the land use plan. Protection of environmental resources is referenced to efficient management of land and its uses and conservation of landmarks and unique ecosystems.

Section _____. General Requirements.

Boundaries between critical areas and other zones should follow existing lot lines if at all possible. New users along boundaries within critical areas should complement existing uses in adjacent zones; additional setbacks and screening are required if adjacent uses are not complementary.

Section _____. Flood plain zone, F-2.

Area affected by floods of fifty year intensity, considered to be the flood-fringe district, is subject to the following restrictions:

1. Land disturbances prohibited unless maximum erosion control is maintained.
2. Excavation and fill prohibited unless complete stabilization is maintained.
3. Extension of public services prohibited into this zone until floodway is controlled.
4. Tax deferral of land remaining in open space use.
5. No basements permitted in structures.
6. Uses permitted under umbrella of these restrictions are those of existing zoning providing no densities are increased by rezoning or variances.

Section _____. Unique Ecosystem, UE-1.

Areas of high natural productivity for living resources are subject to the following provisions:

1. Minimum parcel size of ten (10) hectares.
2. No buildings constructed except for those necessary for management and interpretation.
3. One-half the shoreline adjacent to unique reefs and lagoons to a depth of at least twenty-five (25) meters to be under public control.
4. Access of fifteen (15) meters width no further apart than three hundred meters from next access, topography permitting.
5. No removal of animal, vegetable or mineral elements from sites.

Introduction

Community planning is dependent upon social thrust, economic base and physical support. Despite its physical nature, valid land use planning must be a ramification of social needs while remaining within economic reality. Social needs include such elements as privacy, recreation, education, aesthetics, employment, variety, and protection of land value. Economic reality places satisfaction of social needs within an affordable framework that reflects priorities by individuals, groups, and government. Transportation and communication opportunities provide the working relationship necessary in the land use plan to weld together social, economic, and physical factors. Land use plan implementation is directly related to land controls such as zoning and subdivision regulations. The effectiveness of land use regulations is dependent upon a quality comprehensive plan.

A legal basis for planning and land use regulations has long been established by the court. Terminology in regulatory law usually includes the words safety, health, and general welfare of the people. In addition, regulations must have a substantial relation to the comfort and convenience of the community. Restrictive practices are upheld if they are a part of a broadly based planning process. Courts have accepted the idea that zoning is an ongoing process as most communities make very restrictive zones then change in response to specific proposals. The process becomes more important than the original regulations and the real land policy comes to be expressed in the zoning amendment.

The value of land regulations is to provide for many of the needs of the community while protecting the individual's investment in buildings and land and the community's investment in urban services. "One who uses his land in accordance with zoning regulation's is entitled to assume that such regulations will not be amended to his detriment."¹ To assure such protection, the land regulations must be based upon a comprehensive plan. In fact, many courts have thrown out zoning ordinances because zoning was not supported by an adequate plan.

In March of 1973, a comparison was made by the Territorial Planning Commission staff of population potentials that could be accommodated by the zoning law and by the existing land use plan. This comparison was an effort to try to determine relative needs of the community and was brought about by

the multitude of zone change requests. Results of the comparison indicated that the Land Use Plan could provide for a population of more than 180,000 while the zoning figure was over 286,000. The most recent population projections indicate 170,000 expected by 1990. Land uses other than residential, while not emphasized in the comparisons, also appeared to be adequate if sufficient non-urban open space will be developed for recreation purposes.

Many zone changes in recent years have been approved that did not conform to the land use plan and over the objections by professional planners. Some occurred [through legislation contrary to the legal procedures established in the zoning law. It may be argued that the original island-wide zoning adopted in September of 1967 did not follow specifically the land use plan; however, the early zone change requests received recommendations by the planning staff in conjunction with an analysis of conformity to the land use plan. A current analysis of existing zoning should be concerned with those areas that do not conform to the existing land use plan and especially those that were the result of zone changes since the new ordinance was put into effect. In this manner, it may be possible to determine if the protection promised by the zoning law has been compromised by subsequent changes of zones. Court action could then be initiated to remove zoning incompatible with the land use plan. A vacant land or lot survey should also be conducted to determine the extent of potential development within the limits of the land use plan. Revisions to the plan could be made with due consideration of non-conforming uses and to modern mixtures of use. Variances should also be checked as densities or lot coverages may also be incompatible. While this study is to develop regulatory techniques for critical areas that are primarily undeveloped, there may be urban critical areas undetermined but of value equal to open space critical areas. Underserviced areas may present a degree of criticality greater than undeveloped areas.

Land speculation during the inflationary period from 1967 to 1975 was probably responsible for many of the rezoning requests. While the risk of speculation investment may warrant a high rate of return, such return is limited to an individual or groups but may also be detrimental to the community as a whole. During such an inflationary period, land values become unrealistic with parcels of land changing hands many times only for quick profit with no investment benefit to Guam. Value of land is dependent upon many factors, i.e., location, site, access, topography, utilities, availability, all of which determine capability. Zoning is also an element of capability and essentially brings together all the elements that indicate the value of a particular parcel or

lot. In most cases, access and utilities are paid for and maintained by public revenue. These same improvements raise the value of the property and serve increased densities permitted by zone changes. For these reasons, it is extremely important that land values include zoning as a basic criteria for assessment. Zone changes for speculation purposes only will be reduced because taxes would be increased. If the changes are for legitimate investment such investment will pay its fair share of taxes. Without zoning criteria as a basic element of taxation, regulation will always be ineffective.

In summary, land use regulations to be effective, must reflect socio-economic needs and conditions. A comprehensive plan provides the necessary legal basis for land use regulation. Without equitable taxation, regulations will not provide the protection promised to the land owner to pay no more than his fair share for community services.

Critical Areas Planning

Land use planning and regulation is normally a responsibility of local authority. The Federal government, however, has instituted a program at the state level to insure adequate protection of critical areas where local programs are lacking. Although a single jurisdiction, Guam is considered a state for many Federal programs. Local protection of critical areas on Guam has proceeded haphazardly during the minimum planning effort of the past. The current critical land use program funded in part by the Federal government provides a needed approach for a total land use planning effort.

Environmental protection goes far beyond pollution control and philosophically is directed to the most beneficial use of land for all the residents and their posterity. A concept of critical areas concerns restrictions to development, especially where natural resources are involved. However, good conservation practices and management programs assure maximum utilization of resources, which is the essence of environmental protection. Other critical areas contain various cultural attributes that need protection and possibly enhancement. Remaining critical areas require special techniques to permit even minimal development.

Non-Renewal resources on Guam are limited to soils and coral. Although competition with other economic activities is primarily responsible for low agricultural output, few areas of deep, fertile soil exist. Therefore, good soils must be protected and correctly managed to assure future production, especially with greater emphasis being placed on a "green revolution" to combat recessions and unemployment and to diversify a limited economic base. Coral has important uses in construction and Guam appears to have a sufficient

quantity. However, there are only a few areas of high quality coral which should be protected from intrusion as well as managed for greater efficiency with the post-mining land remaining planned for appropriate reuse. Some areas may have potential for ^{slag + coral to manufacture cement are being} ~~cement or tile production~~ but have not yet been identified.

Renewable resources include flora, fauna, and water. Marine resources are included although, whether land or water, flora and fauna "habitats" are difficult to delineate. The potable water resource is extremely critical being the direct result of localized rainfall and the effectiveness of the principal ^{underground} reservoir, the water "lens" in the northern portion of Guam. This natural reservoir ¹⁰⁰ supplies water to the majority of Guam's population and although a series of dams in the south may, at great expense, match the capacity of the lens, the lens must be protected to permit foreseeable development with appropriate services. ~~Dam construction should proceed for recreation and irrigation~~ ^{must} ~~purposes, where economically feasible, as a bridge to future water needs.~~ ^{irrelevant}

Historic and landmark sites are normally limited in area and development may proceed around them. Their cultural importance is great and they should become centers of interest with strict protection and appropriate design as part of the community. Archeological, cultural, legendary, and viewpoint sites are included for maximum protection. Developers should be granted increased densities near these areas only if they aid in their protection.

Recreation and scenic areas are an essential part of the total community. Qualities of site may not be as specific as in other critical areas but suitable sites should not be utilized for non-critical activities that can be located in alternative areas. Obviously, competition for uses will occur in many areas and the needs of the community may be satisfied by several alternative areas. Cost of acquisition, extension of services, access, and maintenance must be considered for each alternative selected. In special locations, such as coastal areas, environmental protection efforts may require large amounts of land and water to be unused and preserved in a natural state.

Ecosystems are generally unique wherever located but those that are dissimilar from common types require exceptional techniques for protection. Coral and other marine life are easily disturbed by ^{and} ~~overfishing and~~ promiscuous collecting. Regeneration is difficult and slow. Life support systems for various birds and animals are also difficult to maintain on an island as small as Guam. There is a constant eroding away of the natural habitat as areas become more accessible and prime land for urban development diminishes. Identification of unique ecosystems may occur as the bulldozer is in the act of destruction.

Natural hazards areas normally are associated with an abundance of water such as flood plains, swamps, and coastal regions. Seismic areas, steep slopes, and aircraft noise may also cause difficulties to potential developers. Efforts to reduce hazards may be expensive and development of such areas may create secondary problems in adjacent parcels. Protection in these areas is directed to the developer rather than to the land unit itself, although the ultimate consumer needs protection from inadequate development. Most programs utilizing federal or municipal funding to alleviate hazards take a close look at the value of potential damage in relation to the amount of public expenditures.

Any selection of critical areas is difficult and possibly open to question. All facilities constructed with public funds are essentially critical and should be protected from adjacent development that may reduce the value and effectiveness of the establishments. Of course, zoning or other land regulations should provide adequate protection but there is a tendency to consider economic return to individuals of greater importance than a liveable environment to the community. Such thinking has permitted zone changes and variances in conflict with due protection. "Economic self-interest has too often been the prime objective and local zoning and appeals boards, as well as city and county commissions, have gone along with spot zoning and heavier density, for example, in order to help out the developer who paid too much for his land."² The community must be considered first as development pressures increase, especially during times of runaway inflation and land speculation which take an area by storm and damage is only recognized during the longer period of calm after the storm.

In preparing regulations that provide optimal use of critical areas, certain guidelines are followed. Short-range economic benefit to individuals is not a valid consideration for development. Emphasis is placed on community benefit and the degree of criticality of each area. Fragile areas and historic sites are of high priority receiving the most consideration for protection rather than development.

Elements of Land Regulation

Density of development is the most important element in the regulation of land. Cultural needs and acceptance is a factor of density as are the capability of land to support development, market requirements reflecting both social and economic considerations and the needs of a community in a particular area. Protection and utilization of natural features and resources affect the

capability of a parcel. Densities may be related to population, residential, or business units, floor area ratio, employment, or customers.

Of great importance in land regulation is the designation of use. Each use has its own requirements and with their appropriate mixtures control potential density and the demand for urban services. Much of urban design reflects the various uses and the densities permitted. Cultural and economic activities influence quality and quantity of uses.

Performance standards ^{are:} ~~generally determine the space requirement of uses.~~ ^{ie.}

Space may be measured by the number of bedrooms, size of recreation area per family, school site area, parking area per customer, and the like. Utilities required by various uses are part of the uses performance standards. Yard area, setbacks, loading space, service alley, and building heights are representative of performance standards. Certain methods such as cluster development, greenbelts, sediment control and flood prevention are factors in assuring that adequate standards are maintained for optimum use of a parcel of land while providing a creative and aesthetic urban design.

Land Tenure

Acquisition of land by government or private individuals may take many directions. Fee simple is the most direct, utilizing a willing-buyer willing-seller approach. Leasehold arrangements have special conditions but essentially permit uses for periodic payments. Easements are usually granted for utilities or access and may require an original lump sum payment or may just be granted to acquire the services. Easements may also be for recreational, flowage, safety, scenic, clearance, height, or recharge uses. Rights of use may be purchased either by lump sum or by periodic payments. In many cases, rights of use such as mineral or ~~oil~~ rights may be retained by a former owner in the event that new discoveries are made.

The government has the right of eminent domain which permits the government to obtain any private land for public purposes. Of course, just compensation is required and in many cases the courts have to decide what is just compensation. In some situations the government may only take a portion of a parcel but in doing so may render remaining portion unusable and would have to compensate accordingly. Not all eminent domain is by fee simple but usually negotiation is sufficient for leaseholds, easements, or purchase of development rights.

Tax Exemptions

What follows on the next page

Property taxation is a tool used by many governments to regulate development. As urban development occurs around vacant land the value of the vacant land increases and consequently taxes are increased forcing the owner to develop. If the entire area has been selected for urban expansion through comprehensive planning, and services are made available equally throughout the area, then the government is justified for raising taxes on vacant land. Exemption or reduction of taxes may be used as a means of payment for easements or acquisition of development rights for a particular period. To encourage agriculture, communities may exempt the farmer from payment of taxes as long as he continues to farm the land. Retention of green space in selected areas may also be accomplished by this method. In most cases, the exemption is rather a deferral until the time that the farmer chooses to utilize or sell the land for non-agricultural purposes. The deferral method reduces speculation on a high land value achieved by adjacent urban development and services surrounding the agricultural parcel with only token farming being conducted.

Transfer of Development Rights

A comprehensive plan indicates areas of varying urban densities as well as open space. Although the plan may be perfectly justified, certain land owners will not have the opportunity to develop an urban complex on their land with the high monetary return that usually accompanies such development. With TDR's, to partially compensate for this legal inequality, a developer that is fortunate in having his land identified for additional density must purchase the development rights over a portion of the designated open space and dedicate those rights to the community. In this manner, the owner of the designated open space receives an amount for his land near a par with the land value of designated urban land.

Planned Unit Development (PUD)

Where inexpensive land is somewhat removed from the urban scene, a PUD may be created. This development may cover a minimum area of five hectares for commercial development to a minimum of twenty hectares for residential. The developer is required to construct all urban services within the project area and to bring those services as extensions of existing services to the project area. In some instances, the government may contribute in bringing those services to the project area in greater capacities to serve expected development between the existing urban area and the project area.

Right of First Purchase

Especially in planned unit developments, certain parcels may be indicated for community facilities such as schools or special parks. Usually in a PUD, a cluster technique is utilized to concentrate open space for parks and playgrounds within residential areas. Such areas are required and not subject to government compensation. School sites, however, due to their extensive nature are planned within the residential complex to reduce the expense of busing and to provide a center for community activity. The government must purchase such a site prior to completion of the PUD. The purchase price should be that of the original cost plus a portion of the cost of improvements. If not purchased at a given time, the developer may utilize the site for further agreed-upon development. A proportion of the residential units may also be purchased by the government for use by low-income families in accordance with established law and managed by a designated agency. These conditions of project approval contribute to the health, safety, and general welfare of the community.

Mineral Extraction Sites

At present, only three types of surface mining occur on Guam: extraction of high grade coral and limestone, extraction of topsoil and general fill material, and extraction of sand. Sand and high grade coral are in limited supply on Guam and all efforts should be made to protect these areas from competing uses. Conversely, a concentration of existing uses adjacent to these resources are entitled to a certain amount of protection. The following considerations are essential to the land regulations concerning surface mining:

1. Zones of heavy, light, and adjacent use.
2. Minimum parcel sizes.
3. Boundary and road setbacks.
4. Slope control.
5. Pollution control.
6. Continued use and reuse.

Historic and Archeological Sites

For the most part, these areas are comparatively small, although the proposed War in the Pacific Park covers an extensive area. Protection is of primary importance, but the study of various aspects of our cultural heritage by all interested people would only be possible if the areas are accessible. Urban

development would be enhanced by historic, legendary, and archeological sites by attracting many people. General provisions should include:

1. Minimum parcel size *or definite marking*
2. Accessibility, parking, and utilization.
3. Protection and security.
4. Interpretation.

Scenic Areas and Vistas

Sightseeing usually has more participants than any other form of recreation. The large parcels concerned with scenic and vista areas lend themselves to complementary uses of camping, picnicking, beach activities, and possibly historic and archeological sites. Multiple uses of public land tend to provide greater improvement and security than single uses. Vistas also require certain considerations of adjacent property. In order to adequately protect and utilize scenic areas and vistas, regulations should include:

1. Accessibility.
2. View protection.
3. Multiple public uses.
4. Adequate space.
5. Public acquisition of development rights.

Hazardous Areas

Airports present two distinct types of hazards, accident and noise, to community development. The United States Air Force has prepared quantitative data concerning hazardous areas in the vicinity of airports and has specifically identified zones of compatibility with selected land uses for the areas affected by Andersen Air Force Base (AAFB) on Guam. Essentially, the development limits suggested by the study should be made part of the regulations affecting geographic areas of particular concern on Guam.

Information obtained through the Air Force Study should be applied to the Naval Air Station (NAS). The apparent lack of planes assigned to NAS and the limited number of commercial flights should demand a thorough analysis of the missions of all aircraft oriented activities on Guam with the express purpose of determining the feasibility of combining all activities to be served by AAFB. Weather, reconnaissance, practice takeoffs and touchdowns, commercial flights, Strategic Air Command (SAC), and air reserve operations could probably operate at AAFB more efficiently than at present. Northwest Field could be utilized for storage and emergency with a connecting taxiway to AAFB.

A civilian terminal could be constructed outside the front gate of AAFB and passengers carried by bus or fixed rail to an embarkation station at the end of the runway. Cargo could also be handled in such a manner while maximum security is maintained to protect military activities. The location provides a single approach zone and would permit the removal of the single greatest obstruction to Guam's central development, NAS. Not only is NAS causing noise and hazard over a large portion of Guam's central area, but it also blocks major desired routes of traffic. A reuse of NAS could include a site for the Capitol District of Guam, multiple school facilities, a new town development within the central area of Guam and retention of general aviation, local charters, and a heliport for shuttle, public safety or private use. Many of the existing buildings could be utilized for the suggested development. The value of the land and buildings would more than pay for the relocation of facilities to Andersen. Although noise and accident hazards create a variety of problems, land use controls will be detailed in the areas of:

1. Protective measures
2. Performance standards
3. Specific use control

Seismic and fault zones do not present a clear area of particular concern. While a certain clustering of fault lines can be identified, a broad approach is through informative methods rather than land use regulations. The area of greatest frequency is also the area of greatest development concentration. Deeds should indicate that the property is in an earthquake zone and the building code should include structural requirements to minimize damage. There are no preventative measures that are feasible at this time with the possible exception of not permitting increased densities; therefore, no regulatory measures are proposed in this study.

As with many federal programs, a requirement for assistance requires regulation of an area. For example, subsidized flood insurance for a community is only possible if flood plains of rivers and streams are regulated. The value of flood plains is evident from history with the location of high population densities taking advantage of the level, fertile land, water, and transportation. Conversely, damage to man's settlement of flood plains has been extensive and costly but still we build upon the remains. Settlement control has advantages over flood control but the value of location on flood plains mandates development regulations to permit urban utilization. Provisions to regulate the use of flood plains include:

1. Reducing Flood Hazards *and Flood Hazard Potential*
2. Controlling Development
3. Prevent Obstruction to Floodways
4. Floodproofing and Protective Works
5. Modification of Existing Uses

Aquifer Recharge Areas

While water is a renewable resource, the primary reservoir on Guam, the water lens, is vulnerable to pollution of raw sewage and urban waste runoff. The criticality of this resource is above all others on Guam due to its affect on a large majority of the people. In addition to minimizing pollution, efforts must be made to maximize the natural recharge channels and areas. In addition, provisions should include:

1. Rigid density control.
2. Natural and man-made pollution control.
3. PUD control emphasis.
4. Controlled agricultural use.

Agricultural Zone

Soils, as the basic requirement for agriculture, are renewable but only over a long period of time. Soils are as vulnerable as water in their being made of little use through mismanagement. Wherever soil is disturbed erosion occurs and strict control must be applied to potential disturbances to assure that sufficient soil exists for present as well as future generations. Soil fertility is renewable through appropriate management that may include agricultural use. An agricultural zone provides many necessary elements to a developing region. The possibility of the world having a population too great to be fed by estimated resources may occur early in the twenty-first century as population passes the seven billion mark. Every area, therefore, should do all in its power to protect its best agricultural land from erosion, mismanagement, or urban encroachment. Agricultural zoning encourages an economic activity very much in need on Guam not only for import replacement but for a greater number and diversity of jobs. Tax deferral for land in agricultural use would assist farmers to produce food at the lowest cost and the accumulated tax as a lien on the property would only be collected when the land use is changed. Two purposes for which agricultural zoning has been utilized in other areas are preservation of open space and a holding zone until the direction of urban development has

been determined. The regulatory provisions herein proposed do not consider the latter two purposes of prime importance and should include:

1. Parcel size
2. Restrictive non-agricultural uses, lot coverage
3. PUD and density approach
4. Tax deferral

Unique Ecosystems

Areas of high natural productivity of unique, fragile or natural habitat for living resources include swamps, mangrove, cliffs, forests, lagoons, or reefs. Minimum disturbance and maximum protection are essential to maintain their special character. General provisions include:

1. Size and density
2. Maximum protection against building except for interpretation
3. Adjacent shoreline, if water-based ecosystem, must provide access and protection

Proposed Regulations

Chapter _____. Geographic Areas of Particular Concern.

Section _____. Identification.

Areas of unique importance to the development of Guam, such as natural features and resources, cultural landmarks, and hazardous areas, fall within critical areas designation. The zoning map identifies specific types which are treated in these regulations.

Section _____. Purpose.

Technical and population increases have overbalanced the agricultural production of Guam and are straining its resources. These regulations are designed to obtain maximum use of physical, economic, and cultural resources within the framework of the land use plan. Protection of environmental resources is referenced to efficient management of land and its uses and conservation of landmarks and unique ecosystems.

Section _____. General Requirements.

Boundaries between critical areas and other zones should follow existing lot lines if at all possible. New users along boundaries within critical areas should complement existing uses in adjacent zones; additional setbacks and screening are required if adjacent uses are not complementary.

Section _____. Acquisition of Critical Areas.

Every effort should be made to acquire critical areas of public use such as historic and archeological sites, scenic areas and vistas, and unique ecosystems. Methods of acquisition include, but are not limited to, fee simple by payment or exchange of public land of equal value, scenic easements, purchase of development rights by cash, tax exemption, transfer of development rights, and by dedication as may be required.

Section _____. Coral, Limestone, and Fill Extractive Zone, E-1.

Surface extraction conducted in the areas of highest grade material within the following restrictions:

1. Minimum parcel size of ten (10) hectares.
2. Existing density of no greater than two (2) dwelling units per hectare within one (1) kilometer of proposed activity.
3. Primary use of extractive with supportive uses.
4. Methods must be utilized to minimize seismic and air pollution hazards to a distance not less than one (1) kilometer from the boundary of the parcel where excavation is being conducted.
5. An access road for each fifty (50) hectares to be utilized for subsequent as well as existing access; gradient of access roads not to exceed eleven (11) percent.
6. A setback of fifteen (15) meters from boundaries of adjacent properties.
7. A setback of twenty (20) meters from the centerline of access roads and thirty (30) meters from the centerline of existing roads.
8. A slope away from setback lines not to exceed thirty-five (35) percent, unless one side is open to the sea or adjacent level land.
9. Excavation is not to be conducted below the six (6) meter contour.

Section _____. Sand and Gravel Extractive Zone E-2.

Surface extraction in overlay zone controlled by the following:

1. Minimum parcel size of one (1) hectare; exception if adjacent property owners agree.
2. In areas not exceeding a density of ten (10) dwelling units per hectare.
3. Primary use of extractive with supportive uses.
4. Methods must be used to prevent pollution beyond property limits.
5. Use of explosives prohibited.
6. Setback of six (6) meters from boundaries of adjacent properties and from right-of-way of all roads.

7. Slopes of cut to be stabilized preventing erosion of adjacent land into cut.
8. Excavation below six (6) meter contour line and parcels less than one (1) hectare to be filled and compacted for future use.
9. No excavation permitted within twenty-five (25) meters of the shoreline.

Section _____. Excavation Fringe Zone E-3.

An overlay zone not changing existing zone designation with characteristics and control as follows:

1. Area within one (1) kilometer of E-1 zone having no more than two (2) dwelling units per hectare.
2. Seismic or air pollution to be minimized with schedules to be posted at site forty-eight (48) hours before activity is conducted that may cause temporary pollution.
3. No change of zone permitted to increase density until excavation has been substantially completed.
4. Additional development must have hazard warning as part of building permit.

Section _____. Historic, Archeological, Scenic, and Vista Areas.

Protection and utilization of landmark areas requires the following:

1. Minimum parcel size of .5 hectares.
2. At least fifty (50) percent of historic and archeological sites are to be in landscaping, access, parking or visitor associated uses such as interpretive center.
3. Access of at least fifteen (15) meters in width, five (5) of which are paved or improved as an all weather road with appropriate drainage.
4. Parking area of clearly delineated stalls having a capacity of five (5) cars and one (1) bus for each hectare or part thereof.
5. Multiple use is to be encouraged within parcels having a minimum of two (2) hectares with uses limited to:
 - a. Historic and archeological sites, .5-2 hectares.
 - b. View and scenic parks, 2-5 hectares.
 - c. Picnicking and barbeque, 5-20 hectares.
 - d. Camping and recreation, over 20 hectares.
6. Fencing required for sites of less than two (2) hectares and vegetative screening or grade separation for those two (2) hectares or larger.

7. User fees of fifty (50) cents per car or ten (10) cents per pedestrian will be charged for maintenance.
8. Privately owned landmark sites are exempt from property taxes providing that architecture and site design are approved by a Design Committee of three representing the Bureau of Planning, Department of Parks and Recreation and the Department of Land Management.
9. Two enclosed structures are permitted in the area, if approved by the Design Committee, and are to be utilized as follows:
 - a. Residential building for manager to provide maximum security.
 - b. Visitor service building housing rest rooms, interpretive center, food service, camera supplies, and souvenirs directly relating to Guam.
 - c. Two structures identified in (a) and (b) may be combined in one structure.
10. Franchises for residential and visitor services center may be obtained in public landmark areas, either together or separately; management and security services are considered sufficient for the franchise fees of the residence while an annual ten (10) percent of the value of the visitor service center structure would be a minimum acceptable charge to successful bidders.
11. The Department of Parks and Recreation is responsible for construction of landmark site structures and the franchising of those facilities with advisement of the Design Committee; the Department of Parks and Recreation would be the recipient of franchise and user fees to be placed in a revolving fund to continue such activities.
12. Pavillions and comfort stations may be constructed in addition to the manager residence and visitor service center with the approval of the Design Committee.

Section _____. Agricultural Zone A-1.

Land having appropriate slope, drainage, soil and irrigation potential should remain in agricultural use protected by the following:

1. Minimum parcel size of one (1) hectare.
2. Maximum density of one (1) dwelling unit per hectare.
3. Uses permitted are crop production and residential with livestock permitted if impact is not detrimental to other uses; aquaculture, if appropriate character of land.

4. PUD permitted at maximum density of one (1) dwelling unit per hectare and minimum parcel size of twenty-five (25) hectares with following standards:
- Residential primary use.
 - One commercial unit not to exceed one hundred (100) square meters of floor area for each twenty (20) dwelling units.
 - Recreation area(s) for residential units to have a minimum of fifty (50) square meters per dwelling unit.
 - Two off-street parking spaces for each dwelling unit and for each twenty-five (25) square meters of commercial floor area.
 - Landscape area surrounding all buildings to be at least ten percent (10%) of floor area within buildings.
 - A setback from zone boundary of at least twice the maximum height of the tallest structure.
 - Non-agricultural area not to exceed 10% of the total parcel.
 - Complete urban services required including sanitary waste disposal.
5. Land annually in use for agricultural production may have tax deferral until use is changed.

Section _____. Transport Hazard Zone, T-1.

This zone approximates the Clear Zone as identified in Air Force compatible use zone documentation and has the greatest accident potential requiring the following regulations:

- No uses permitted.
- No obstructions within zone.
- Length and width of clear zone is three thousand (3000) feet at end of runway.

Section _____. Transport Hazard Zone, T-2.

The basis for this zone are the Air Force Accident Potential Zones I and II having sufficient hazard and noise levels to warrant the following regulations:

- Uses concerned with public meeting, offices, or having noise levels that are usually low must be within structures designed and constructed to provide Noise Level Reduction (NLR) to at least 45 decibels.
- Uses must have low labor intensity.
- No uses permitted that involve explosive, fire, toxic, corrosion, or other hazardous characteristics.

4. Extent of zone has a width of three thousand (3000) centered on the runway and a length of twelve thousand (12000) feet.
5. Uses permitted, ~~but~~ meeting all provisions of this section are:
 - a. Mining or surface extraction.
 - b. Agriculture, except livestock.
 - c. Forestry.
 - d. Cemeteries.
 - e. Utilities.
 - f. Wholesale and storage.
 - g. Highway, transportation corridor.
 - h. Manufacturing.
 - i. Open space recreation of low density types.
6. Aquifer recharge as an overlay zone meeting most stringent requirements of either zone.
7. Densities and performance standards of permitted uses are those normally required if they do not conflict with other provisions of this section, providing that setbacks along zone boundary be twice that of the adjacent zone or use.
8. A height limitation of thirty (30) feet will be maintained throughout this zone.
9. Uses denied.
 - a. Residential, except for security personnel.
 - b. Retail sales and services.
 - c. Activities of large groups of people.
10. Special exceptions are airport support and associated uses.

Section _____. Transport Hazard Zone, T-3.

Noise is the basis for this zone having a decibel intensity greater than 65 requiring the following:

1. Uses concerned with public meetings, offices, or having noise levels **that are usually low** must be within structures designed and constructed to provide Noise Level Reduction (NRL) to at least 45 decibels.
2. Extent of zone is indicated on zoning map.
3. Uses permitted, but meeting all provisions of this section are:
 - a. Uses permitted in T-2, Subsection 5.
 - b. Retail sales and services within PUD's.

4. Aquifer recharge as an overlay zone meeting most stringent requirements of either zone.
5. Densities and performance standards of permitted uses are those normally required if they do not conflict with other provisions of this section, providing that setbacks along zone boundary be twice that of the adjacent zone or use.
6. Uses denied.
 - a. Residential, except for security personnel.
 - b. Uses susceptible to high noise levels.
7. Special exceptions are airport support and associated uses.

Section _____. Flood Plain Zone, F-1.

Floodway ~~district~~ is the channel of a stream and the adjacent flood plain that carries and discharges flood water or flood flows of any river or stream and requires the following:

1. Uses permitted.
 - a. Parks and open-space recreation.
 - b. Assessory uses to the above.
 - c. Agriculture with maximum erosion control.
2. Uses prohibited.
 - a. Livestock.
 - b. Structures and fill.
3. Special permit.
 - a. Docks and boat launching.
 - b. Boathouse appropriately designed.
4. Flood hazard reduction techniques permitted if properly reviewed by appropriate agencies.
 - a. Land treatment practices.
 - b. Dikes, levees, and sea walls.
 - c. Channel straightening and dams.
 - d. breakwaters.
5. Tax deferral permitted if no economic use is placed on floodway.
6. Non-conforming uses not to be expanded, rebuilt, or changed to another non-conforming use.
7. Artificial floodway obstructions to be removed at expense of perpetrator.

Section _____. Flood plain zone, F-2.

Area affected by floods of fifty year intensity, considered to be the flood-fringe district, is subject to the following restrictions:

1. Land disturbances prohibited unless maximum erosion control is maintained.
2. Excavation and fill prohibited unless complete stabilization is maintained.
3. Extension of public services prohibited into this zone until floodway is controlled.
- ~~4. Tax deferral of land remaining in open space use.~~
5. No basements permitted in structures.
6. Uses permitted under umbrella of these restrictions are those of existing zoning providing no densities are increased by rezoning or variances.

Implementation

Several elements mentioned in the introductory material are essential to the adequate implementation of land use regulations. Further explanation is warranted to place in perspective the workings of the "wheel" which we seem to have forgotten over years of political erosion. These workings apply to overall land use regulation which is important to the success of regulations applied to critical areas.

Land use regulations are "protective" rather than "restrictive" if we consider the community as a whole, which we must do, rather than an individual. What do the regulations protect? They protect each person's land value by insuring that surrounding uses are compatible. They insure that supporting uses are adequate to serve area being developed. They insure that satisfactory space is afforded to each use. They insure that infrastructure, access, and public services meet requirements efficiently. Regulations must be well prepared and supported to accomplish such protection. Such is not the case on Guam and although lack of enforcement is usually blamed for failure of regulations to be effective, there are basic needs that precede the regulatory process.

1. A comprehensive plan provides the direction that development takes. Socio-economic needs for the future as well as the present are anticipated with provisions to minimize problems. Selection of land areas to satisfy spatial requirements, standards to indicate quality of service, and goals to establish land use policy are all included in the plan. Regulations to implement

the plan should only be the administrative process and a reiteration of development standards. The plan is the foundation for development activities and, although flexible, represents guidelines and a framework within which the complex activities of the community operate.

2. Land values are essentially established by the comprehensive plan, indicating densities and uses permitted for each parcel and the level of services provided at public expense. Certain land owners may be considered fortunate in an economic sense if their parcels are designated for high density of varied activities. A high risk is also a factor in having high density potential and higher taxes are assigned to pay for the level of services necessary for high density. Without these interdependent factors, land assessment and taxation is not equitable and protection is non-existent before regulations can actually be implemented.
3. Much planning is based upon existing conditions and patterns of development. Imposing new regulations always create pockets of non-conforming uses. Planning is incremental, depending upon population change as anticipated. A plan to accommodate double the population at a given time may give greater choice in where a person or firm may locate. Such a plan is costly in providing community services over a large area that has many pockets of vacant land not requiring a sophisticated infrastructure. Non-conforming uses will increase as current zone changes are permitted without the support of a plan. The court should be busy overturning the rush of zone changes that are not based upon a plan, especially those instigated by legislative action that normally do not follow sufficient investigation and justification.
4. Transfer of Development Rights cannot be successful without a quality plan and especially without an equitable land value and taxation system. TDR is more an effort to pay a person a higher price for his land which is designated for open space giving him an economic return more nearly equitable with urban land. It also places a greater responsibility on the developer to provide adequate open space to serve the increased numbers of people he is bringing into the area. The TDR is, therefore, very sophisticated and not directly involved in daily land use regulation.

5. Land for public use would be better controlled by government than upon an individual's whim. Acquisition by the government may be accomplished by many methods stated previously. A comprehensive law is necessary to tie these methods together in one administrative agency also having support of the comprehensive plan. Land exchange, leasehold, easement, development rights, and tax deferral methods should all be employed to bring under governmental control land used for public purposes. Critical areas especially need such control, but without a comprehensive effort in all sectors success is piecemeal, fragmented, and unpredictable.
6. Planned Unit Development is a technique to permit concentration of buildings and services in a creative manner providing variety and interest to the ultimate consumer. An application of detailed performance standards causes all development to be planned. The subdivision regulations are contradictory to the flexibility of planned development and cut up large parcels to produce lots, not liveable neighborhoods. PUD's do not belong as a section within the subdivision process but rather as the guide to incorporate many aspects of development standards within the total subdivision process.

Critical areas regulation is not a separate instrument but merely a chapter in the total development book. The planning process of data collection, analysis, problem identification, goals, alternatives, and plan preparation in itself is comprehensive and if properly conducted brings together the related elements of planning and development. Critical areas are more difficult to manage from a community viewpoint as the emphasis is on what you may not do rather than what you may do. Delineation must be abundantly justified and then through an education program community support becomes the basis of implementation.