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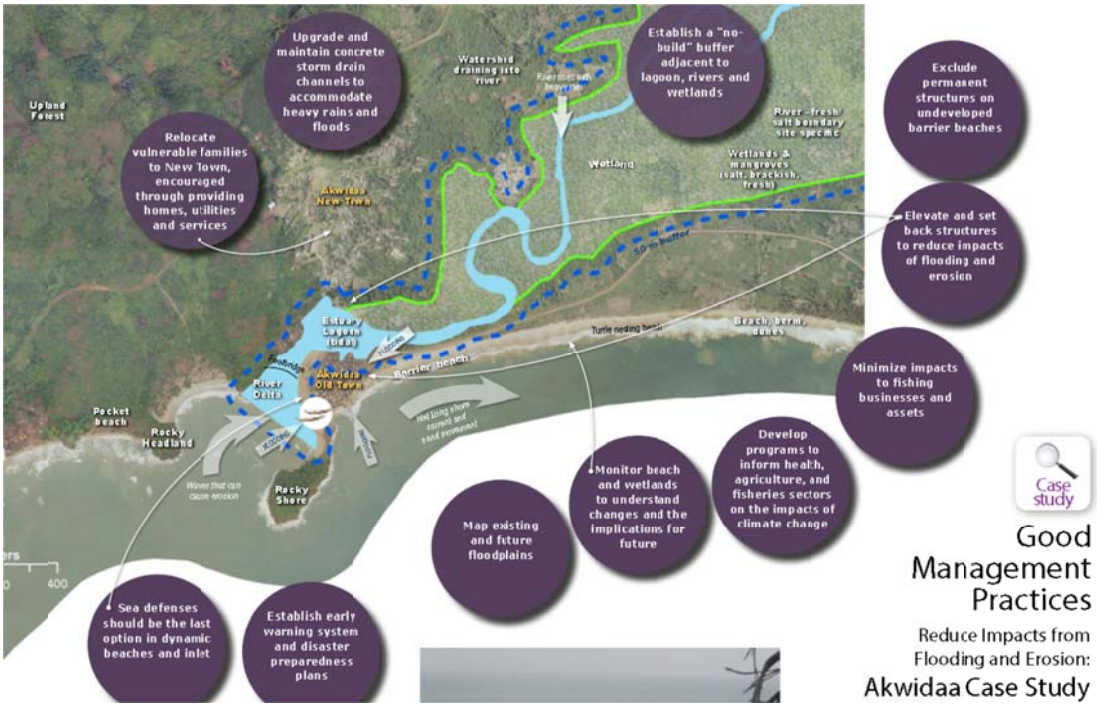
CASE STUDIES IN GOOD MANAGEMENT PRACTICES IN THE COAST OF AHANTA WEST DISTRICT, GHANA



Hɛn Mpoano

THE UNIVERSITY OF RHODE ISLAND GRADUATE SCHOOL OF OCEANOGRAPHY

COASTAL RESOURCES CENTER

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Case study

Good Management Practices

Reduce Impacts from Flooding and Erosion: Akwidaa Case Study

Good Management Practices

Reduce impacts from flooding and erosion.

Akwidaa Case Study

Objective 1 - Citizens, leaders and sectors are fully aware of vulnerabilities from natural flood hazards and options to reduce risk today and in the future.

1. **Develop programs to inform health, agriculture, and fisheries sectors on the impacts of climate change.** Changes in precipitation, temperature and weather patterns affect the health and wealth of the community. Work with government and non-government organizations and academia to share up-to-date information on impacts and actions that can be taken by different sectors of society to be more resilient.
2. **Establish early warning system and disaster preparedness plans.** Community-based programs should include participatory mapping of risk evacuation routes, drills to practice warning and evacuation, and information exchange. Early warning can include informing the community of extreme high tides, heavy rains, and wave activity. SMS and community networks have been successful at getting the word out.
3. **Monitor beach and wetlands to understand changes and the implications for future.** Work with NGO and university to establish a program to track changes, such as beach erosion and levels of flooding. Additionally, wetlands that provide habitat for fisheries will likely change as sea level rise results in higher salinity further upstream. Monitoring can be performed by members of the Community Resource Management Areas (CREMA) or students together with wetland curriculum that could support increased awareness.
4. **Map existing and future floodplains utilizing best available data, models, and results from vulnerability assessments.** The flood hazards map can become an overlay to the physical plan, showing river channels, watercourses, approximate extent of the flood waters, and expected flood elevations. Estimate historical flood elevations using local knowledge and other data and consider future changes in rain fall intensity.

Objective 2 – Changes are made to existing development that accepts the long-term impact of erosion and flooding in high hazard areas

5. **Relocate vulnerable families to New Town**, encouraged through providing homes, utilities and services. Relocate structures at high risk of flood, or those damaged by disaster. Pre-planned urban development with houses and associated services will provide an incentive for families to relocate.
6. **Elevate and set back structures to reduce impacts of flooding and erosion**. Consider the levels of historic storms, tides and anticipated sea level rise when elevating structures or moving them back from the shoreline.
7. **Minimize impacts to fishing businesses and assets.** Boats, gear, landing facilities depend on being waterside and should be set back or elevated to prevent future storm damage. Prepare long term plans for locating other associated activities, such as market, fisherman houses, and gear that do not require a waterfront location away from the shore and not in harm's way.
8. **Upgrade and maintain concrete storm drain channels to accommodate heavy rains and floods**. Use national design standards to reduce flooding of adjacent urban areas

Objective 3: New development is located safely away from high hazard areas

9. **Exclude permanent structures on undeveloped barrier beaches.** The dynamic processes of erosion and wave overwash keep the beach healthy. Temporary, low impact structures may be acceptable, but should be elevated to allow for beach movement. Sea defenses should be prohibited in these areas.
10. **Sea defenses should be the last option in dynamic beaches and inlet.** With the dynamic inlet to the Ehunli Lagoon, erosion control structures, seawalls and jetties will likely impact adjacent areas and increase erosion. Erosion control must be carefully designed to meet engineering standards for expected waves and river flow and precautions taken to reduce erosion potential adjacent to these structures.
11. **Establish a "no-build" buffer adjacent to lagoon, rivers and wetlands.** A vegetated and undisturbed strip of land will reduce pollution, erosion, flooding and habitat destruction. Maintain a "no-net loss" practice for wetlands. If there must be a wetlands alteration, mitigation actions are recommended to accommodate flood storage needs. This mitigation shall take place nearby so that flooding impacts downstream will not increase.

Case study

Good Management Practices

Manage Large-Scale Leisure Development to Benefit the Community, the Private Investor and the Ecosystem:

Princes Town Case Study

Capitalize on community strengths and resources

Establish mechanisms to ensure that the whole community benefits from services of electricity, solid waste, wastewater and potable water

Heavy Rains increases river flow, potential erosion at inlet

Design infrastructure with adequate drainage systems

Establish a "no-build" buffer adjacent to lagoon, rivers and wetlands

50 m buffer

50 m buffer

Identify key resources and design development to protect them

Manage the Ehunli lagoon for low intensity use

Wetlands (salt/fresh boundary varies)

1974 shoreline

Salt water intrusion to groundwater

Road to Axim

Rains cause runoff from roads, agriculture, and urban areas enters wetland and river

Net Long Shore sand transport

Barrier Beach

Lagoon inlet (permanent)

Inlet possition moves

Princes Town

Ehunli Lagoon (brackish)

Develop partnerships to restore and enhance cultural facilities

Target common space areas that foster a strong sense of community

Shoreline erosion

Rocky shores

Net Long Shore sand transport

Barrier Beach

Shoreline erosion

Barrier Beach

Lagoon inlet (sporadic)

Build upon local capacity for broad range of jobs

Utilize the District's Marine and Coastal Management Committee to facilitate participatory and transparent decision making processes

Provide housing accommodations and services for temporary and permanent workers and their families

Respect traditional use heritage and management of coastal resources

Exclude permanent structures on undeveloped barrier beaches

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Meters

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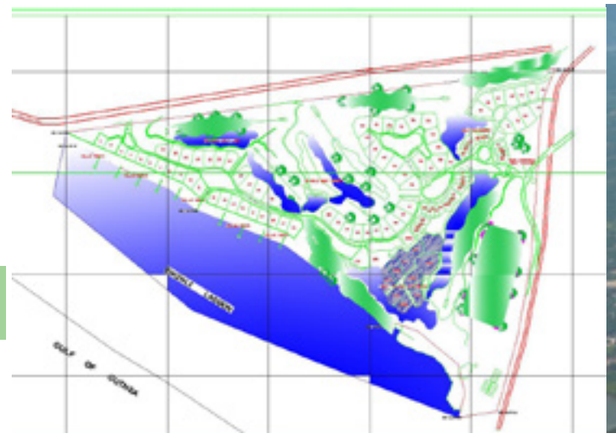
Good Management Practices

Manage Large-Scale Leisure Development to Benefit the Community, the Private Investor and the Ecosystem:

Princes Town Case Study



Objective 1 - Development is harmonized with conservation, increasing quality of life by designing with nature

1. **Respect traditional use, heritage and management of coastal resources.** Traditional knowledge for managing occasional opening of the Ehunli lagoon to the ocean helps maintain salinity for fisheries and reduce flooding of elevated lagoon water levels. Protecting mangroves are critical for bird and monkey habitat and respects local culture, where hurting monkeys is taboo. Maintaining existing public access to lagoon, forest, and coast is important for economic and cultural uses.
2. **Exclude permanent structures on undeveloped barrier beaches.** The dynamic processes of erosion and wave overwash keep the beach healthy. Temporary, low impact structures are allowable, but should be elevated to allow for beach movement. Sea defenses should be prohibited.
3. E**stablish a "no-build" buffer adjacent to lagoon, rivers and wetlands.** A vegetated and undisturbed strip of land will reduce pollution, erosion, flooding, and habitat destruction. Wetlands should not be filled, however, if there is over-riding public benefit for filling wetlands or waterway (i.e. a road access), consider other alternatives including relocation, bridge, or adequate culvert to reduce impacts and flooding. Maintain vegetated buffers for rivers, streams and lagoons (10 – 60m).
4. **Manage the Ehunli lagoon for low intensity use**. Identify areas for both traditional use and non-damaging new uses. Limit boating to vessels without motors. Minimize the number of piers and promote shared use of the water area to reduce disturbance of habitat.
5. I**dentify key resources and design development to protect them.** Map areas of high value habitat and resource value as a first step in locating new development. Undeveloped green spaces (forest, mangrove, wetlands) can be used for passive recreation and tourism. Connecting these areas provides a habitat corridor for wildlife. Grouping/clustering buildings away from key resources will minimize destruction of valuable habitat.

Objective 2 - Services and infrastructure are in place that improve the standard of living for existing and future residents and visitors

6. **Design infrastructure with adequate drainage systems.** Roads should include drains or vegetated buffers to reduce flooding and pollution to rivers and wetlands during rainfall. Building designs and grading should reduce impacts to nearby properties and waterbodies. Where feasible, include cisterns for rain water harvesting and storing drinking water.
7. **Establish mechanisms to ensure that the whole community benefits from services of electricity, solid waste, wastewater and potable water.** Identify approaches such as co-financing, co-management, partnership agreements or service contracts. Locate facilities for solid waste and sewage disposal in safe areas not prone to flooding and ensure proper design.
8. **Provide housing accommodations and services for temporary and permanent workers and their families.** Large tourist developments require additional workforce housing during construction and for continued operation of the expanded community.
9. **Develop partnerships to restore and enhance cultural facilities.** Build upon efforts to restore the facilities, such as Fort Gross Friedrichsburg and partner with Ghana West Coast Destination Management Organization to promote a cultural tourism corridor in Ahanta West.

Objective 3 - Sustained engagement among District, community and development sectors provides mutual benefits

10. **Utilize the District's Marine and Coastal Management Committee to facilitate participatory and transparent decision making processes**. The committee will help develop and implement formal mechanisms for decision making, negotiation, conflict resolution, and participation by stakeholders.
11. **Target common space areas that foster a strong sense of community.** Design spaces to support engagement between existing and new community members. Markets, parks, or buildings can provide opportunities to share experiences, including cultural exchange, outdoor activities and special events.
12. **Build upon local capacity for broad range of jobs**. Work with local and regional leaders, educators and businesses to build capacity of local residents to support new jobs in construction, management, tourism, and services. Business concepts can emerge from initial joint projects between the leisure operator and the community.
13. **Capitalize on community strengths and resources.** Identify ways for enhancing the value of resorts by including local fish and agriculture products, cultural amenities and other eco-tourism approaches as part of the package.

Case study

Good Management Practices

Support Urbanization, Sanitation and Wastewater Management in the Coastal Zone:

Dixcove Case Study

Set aside areas for future relocation of families and businesses

Upgrade and maintain concrete storm drain channels to accommodate heavy rains and floods

Establish and maintain "no-build" areas for river channels and river buffers.

Designate areas for landfill and establish waste management systems

Establish a tourism corridor

Map existing and future floodplains

Improve and extend road system to connect with adjoining communities

Manage and improve developed areas in flood prone areas to reduce damage to life and property

Design and manage sanitation for fishing activities to reduce pollution to the sea and improve product quality

Designate water-dependent areas in the coastal strip

Designate a limited man-made shoreline area, with adequate shoreline defenses

Create a green belt around the urban core

Busuua

Wetland

Busua river

Forest

Drains

50 m buffer

Sandy beaches

Coastal lagoon inlet

Rocky shores

Nfuma river

Dixcove

N

Meters

0 125 250 500

Good Management Practices

Support Urbanization, Sanitation and Wastewater Management in the Coastal Zone:



Dixcove Case Study

Objective 1. Planned and well-maintained urban areas that increase quality of life of the community

1. **Establish and maintain "no-build" areas for river channels and river buffers.** Enforce a no-build area adjacent to the river channel or watercourse. If there is over-riding public benefit (i.e. a road that cannot be located elsewhere) for developing or filling in the watercourse, ensure that flooding will not increase (i.e. raise height of road or install culverts of adequate size). Maintain vegetated buffers that support natural functions for rivers/streams (10 - 60m), minor streams (10 – 20m), seasonal streams (10 – 15m).*
2. **Create a green belt around the urban core**. Protect and manage healthy forests and wetlands in order to capture rainwater, reduce flooding, and support groundwater drinking supplies, while supporting sustainable livelihoods. Connected forests will provide a corridor for wildlife, defines a transition from urban to rural areas and benefits recreation and tourism.
3. **Map existing and future floodplains utilizing best available data, models, and results from vulnerability assessments.** The flood hazards map can become an overlay to the physical plan, showing river channels, watercourses, approximate extent of the flood waters, and expected flood elevations. Estimate historical flood elevations using local knowledge and other data and consider future changes in rain fall intensity and increased development of urban areas.
4. **Set aside areas for future relocation of families and businesses.** Relocate structures at high risk of flood, or those damaged by disaster. Pre-planned and pre-built urban development with houses and associated services provide an incentive for families to relocate.
5. **Establish a tourism corridor** to provide uniform promotion, signage and maintenance of communities, landscapes, cultural and heritage sites that have tourism value. Prepare plans for development and support services that support District goals to promote the tourism industry. Train local residents to work as guides for tourists, ensuring some local income and promoting interest in natural and cultural assets.
6. **Improve and extend road system to connect with adjoining communities.** The "ring road" approach would mark a clear transition from urban to rural where services, densities and land uses are different. Design adequate storm water drainage adjacent to the roads to reduce flooding.

Objective 2 - Shoreline protection that supports long term safety and security of waterfront activities

7. **Designate a limited man-made shoreline area, with adequate shoreline defenses.** Assess condition of current shoreline and defense systems to determine their level of effectiveness to reduce flooding and long term shoreline recession. Upgraded or new structures shall be designed and constructed with engineering standards; consider the need to maintain access for water dependent uses; and reduce impact (erosion, wave damage) to adjacent beaches and properties.
8. **Designate water-dependent areas in the coastal strip.** Prioritize and promote uses that must rely on the sea (water dependent uses) for the water front. These include fishing, swimming, and boat repair. Design of these areas ensures safety to humans and property and respects flood hazards from the land and the sea and long term shoreline erosion.
9. **Manage and improve developed areas in flood prone areas to reduce damage to life and property.** Upgrade or reconstruct structures so they are elevated above flood water levels. Safe heights can be established from local knowledge or maps. If existing structures are highly damaged by flood, encourage residents to relocate away from floodplain.

Objective 3 – Wastewater management and shoreline sanitation improvements that enhance health of residents and ecosystems

10. **Upgrade and maintain concrete storm drain channels to accommodate heavy rains and floods**. Use national design standards to construct drainage and reduce flooding of adjacent urban areas. Plan for maintenance of these channels, including programs to keep them free of solid waste. This could include sensitization of residents on how to identify and useother areas for solid waste disposal and household wastewater.
11. **Designate areas for landfill and establish waste management systems.** Locate disposal sites outside of areas which are vulnerable to floods, with a minimum 90 m buffer to water and streams.* Where feasible, locate outside the coastal zone. Support income generating programs for plastic recycling and collection.
12. **Design and manage sanitation for fishing activities** to reduce pollution to the sea and improve product quality. Identify and carry out programs to ensure that fish handling area and cleaning stations are sanitary. Identify options for clean potable water including piping in or installing water tanks (filled by rain water or tank truck). Explore fish waste disposal opportunities that benefit others, such as composting waste for fertilizer or using it as feed for animals.

** see National Riparian Buffer policy for more information*