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Elements of Tanzanian Coastal Planning

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ELEMENTS OF TANZANIAN COASTAL PLANNING

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May 1, 1973

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ELEMENTS OF TANZANIAN COASTAL PLANNING

Introduction

We, in the United States, have become belatedly aware of the need for organized coastal zone planning as problems created by lack of interest in burgeoning coastal zone uses have compounded. National concern in an organized sense was first voiced effectively in 1969 by the Stratton Commission (Commission on Marine Science, Engineering and Resources, 1969). As late as 1972 progress against the Plan has been described as minimal (Treadwell and Nelson, 1972).

With the passage of the Coastal Zone Management Act of 1972, S 3507 - Public Law 92-583 (U.S. Senate, 1972), the first tentative federal attempts at organization and direction are being made. The federal role of guideline definition and startup funding, with state or regional implementation and control, appears to allow adequate participation of involved interests once the distribution of authority and responsibility can be painfully resolved by test cases. Presently, funding shortages and a power struggle between the responsible agency, Commerce's NOAA, with the Interior Department and certain established commercial and governmental interests, are contributing to frustrating attempts at progress.

While we, and other developed nations, see an overriding need to control man's activity that impinge on the oceans from a Space Ship Earth viewpoint, and have seen the need to try to organize our coastal activities to insure control, the Less Developed Countries (LDC's), as stated in the Stockholm Conference (U.N. General Assembly, Stockholm, 1972), appear to take a more pragmatic view. The control of either their own shores or their inputs to the world oceans are far down their present list of priorities. Their suspicion of developed countries' motives in extending controls to the LDC's have been frequently and clearly stated. Suspicions center both around the Advanced Countries (AC's) unwillingness to let the LDC's exploit heavily during early development, as the AC's did, and the lack of interest in building substantial in-country scientific and technical expertise. The motives of aid are felt to be aimed at self gain and extension of exploitation rather than humanitarian purposes (Centre for Economic and Social Information, U.N. European Headquarters, 1972).

Many authorities in the United States do feel, according to positions stated in the University of Rhode Island-Law of the Sea Conference held during summer 1972, that, in addition to human considerations, it is in our national best interest to cultivate the friendship and cooperation of developing countries to obtain support for

United States objectives in the forthcoming 1973-1974 United Nations Law of the Sea Conference. The United States objectives desired include the ability to conduct research, development and exploitive activities under whatever LDC's revised coastal waters and seabed jurisdictions result from the conference (Knauss, 1972). Most predictions include coastal states' control of most living, and possibly non-living, resources out to 200 miles.

One of the ways suggested to supply something of value to the LDC's is in the area of technical aid to improve national capabilities by enhancing government and university competence (Hochschild, 1972). The University of Rhode Island (Marshall, 1972) is pursuing such an effort dealing with marine problems with the government and university in Tanzania. This proposal includes joint evaluations of fisheries exploitation and stock assessment, mariculture, reef utilization and conservation, resource economics, food and resource chemistry, law, marine training and education, and Coastal Zone Planning. The concomitant implementation and management tasks resulting from these efforts would no doubt be controlled by LDC nationals.

The purpose of this paper is to examine aspects of a Coastal Zone Plan as it applies to the Republic of Tanzania with its differences from and similarities to, the United States.

coastal zone planning experience. Possibly, as a result, some feeling for the problem of organizational concepts and approaches, as well as the current need for Tanzanian coastal zone management will emerge.

Definition of Coastal Zone

Before embarking too deeply in any evaluation of a coastal planning effort, some definitions are in order. In that no definition of the Tanzanian coastal zone is presently available, the definition included in the U.S. Coastal Zone Management Act appears appropriate (U.S. Senate, 1972).

" 'Coastal zone' means the coastal waters (including the lands therein and thereunder) and the adjacent shorelands (including the waters therein and thereunder), strongly influenced by each other and in proximity to the shorelines of the several states, and includes transitional and intertidal areas, salt marshes, wetlands, and beaches. ... seaward to the outer limit of the ... territorial sea. The zone extends inland from the shorelines only to the extent necessary to control those shorelands, the uses of which have a direct impact on the coastal waters. 'Coastal waters' means (1) ... the waters within the territorial jurisdiction ... connecting

waters, harbors, roadsteads and estuary
type areas ... and (2) in other areas
those waters adjacent to the shorelines
which contain a measurable quantity or
percentage of seawater ..."

The Act includes fresh water areas. For the purpose of
this study however, only seaward interfaces will be
evaluated. Lake areas in Tanzania are in some cases
under dispute and while significant, in the overall,
would represent an undue extension of the study.

Rational

Elements of coastal zone planning as seen through the eyes of our own developed country are well documented. The national philosophy of federally established guidelines and planning dollars, with state implementation and control, is detailed in the Coastal Zone Management Act referenced above. Several state plans, i.e., Rhode Island California (State of R.I., 1970, Anonymous, 1969), explore the peculiar requirements of developed states with quite different physical, financial and human resources in widely spaced geographic locations. The specified definitions and control requirements exhibit more similarities than differences.

A summary of the present state of technical coastal zone planning and implementation was prepared for the 1972 Marine Technology Society Conference entitled "Tools for Coastal Zone Management" (Marine Technology Society, 1972). The majority of the systems described required, as a base, a thorough inventory of state resources, description and relationships of impinging interests, definition and assignment of responsibility and authority and, most importantly, clear statements of objectives among the national, regional, state, municipal governments and the civilian participants involved. Adequate representation, legal precedence and necessary compensation were integrated

with the above. Computer data retrieval systems and mathematical modelling of interrelating systems are both being pursued to the degree that funding permits.

It is clear from reviewing the foregoing references that patterns are developing typical of coastal zone problem resolution within the United States. International interfaces are conspicuously absent in the United States coastal view partially because of the good relationships and limited physical interfaces within the North American coastal zone and partially because of a passive attitude toward non-military sources of international coastal conflict.

With respect to international patterns, UNESCO in 1972 published a position paper entitled Uses of the Sea (United Nations, 1972) which, in a broad sense, describes the world-wide aspects of the coastal zone. The study gives perspective to the magnitude and worth of some of the factors involved.

For instance the worlds' ocean products and their uses are worth nearly \$US 60,000 million annually. This includes \$US 20,000 million - Transportation, \$US 8,000 million - Fisheries, \$US 30,000 million - Military, \$US 51,000 million - Fresh Water, \$US 6,000 million - Oil and Gas, \$US 100 million - Sand and Gravel, \$US 50 million - Other Minerals. Estimates of waste disposal and recreation were considered substantial but not included.

Ninety percent of the world's marine food resources come from the Continental Shelf. Total world fish catch has in the decade from 1958, risen from 34 million to 64 million tons (including 7 million tons from inland waters). Fish catch projections indicate 120 million ton catch by the mid 1980s. A steady increase in the west Indian Ocean fishery, including Tanzania, is predicted.

More than 19 percent of the world's oil and 6 percent of its natural gas was obtained from the Shelf in 1970. Within ten years, 33 percent of the world's total output of 70 million barrels a day is expected from the offshore regions.

While it is beyond the scope of this paper to quantify aspects of the world-wide coastal zone problem, excerpts from the conclusions of the United Nations report are of general interest.

Overall growth rate of all coastal zone factors will increase the frequency of interacting operations. Potential conflicts will be concentrated in localized zones of intensive use--less than 1 percent of the total sea area. Conflict probability is increased by multiple area uses, degree of confinement, urbanization,

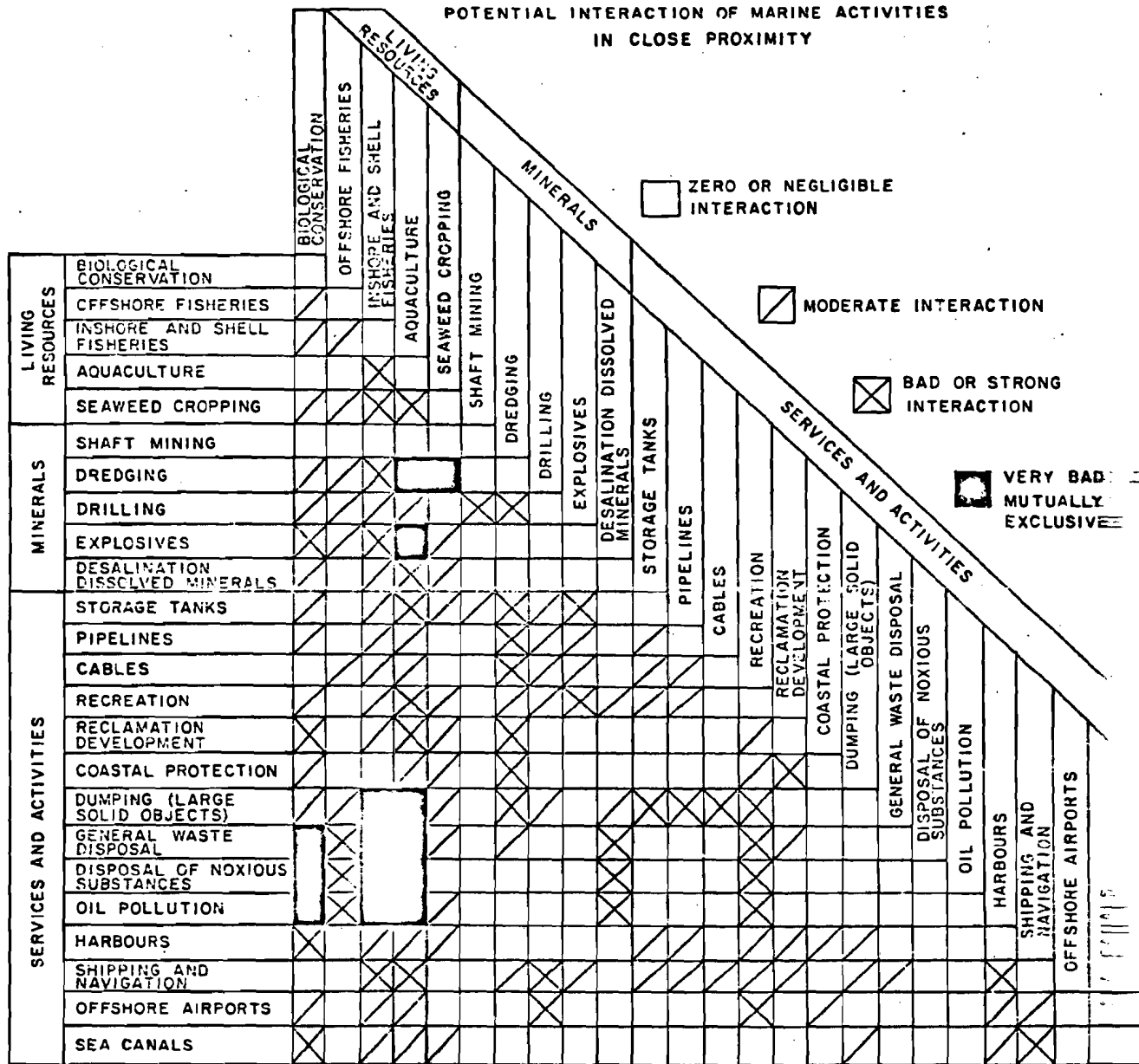
industrialization, increased tourism and recreation, and close proximity between international neighbors.

Specific resolution of local technical conflicts appear to depend on local marine conditions and economic priorities.

Figure 1 describes in a general sense the degree of potential interaction or conflict for a typical national jurisdiction and perhaps provides a framework that one should seek to fill in conjunction with actual development of a Tanzanian coastal zone plan.

Harvey Silverstein of WHOI, in a 1971 study of Egyptian and Israeli technological development (Silverstein, 1971), listed prerequisites for national science policy and administrative development that contain points applicable to the Tanzanian coastal zone effort. Within the national context, the decision-making elite must display a favorable attitude toward rational economic action; be convinced that non-planning has serious negative consequences; agree on operational goals and perceived needs for technological input to improve production. It also must be possible to mobilize

Figure 1



Source: United Nations. 1972. Uses of the Sea

complimentary inputs and institutions to apply the favored technology. An analysis of physical, financial and human resources in science and technology as well as the presence of research centers, decision centers, and research programs are required.

He quotes the United Nations Advisory Committee on the Application of Science and Technology who

"rejects the view, held by some economists that the best hope of developing countries lies in their acquisition of technologies that are already applied in more advanced countries, and that it is a mistake and a waste of their own resources for them to go in for research and technical development on their own, in view of the costs in research and development and the special difficulties encountered in developing countries."

"Developing countries, facing almost diametrically different conditions, will often find that a variant from the technology of the developed countries, and perhaps an altogether different technology is more suited

to their conditions. It is difficult for a developing country without a science and technology capacity of its own, and particularly without the trained people involved, to know what useful technology exists elsewhere, to understand it, to select it, to adopt, to absorb, to repair and maintain, to operate."

In that the advent of a Tanzanian coastal zone plan represents an innovation, the general characteristics described by Everett Rogers in his Diffusion of Innovations (Rogers, 1962) also seem to apply. These characteristics specify that any change in traditional methods must clearly show relative advantage, compatibility with existing culture, a clear statement of complexity, divisibility by pilot trial, and communicability to others.

A British review (Glyde, 1973) of sixteen technological transfer programs primarily correlates good performance with factors which include

Mode of Initiation

LDC Contacts AC

Method of Establishing Objectives

Use of DC or Collaborative
Recommendations

Type of Visit by AC Personnel

Repeated Long, Short Visits,
No Visits

Type of Funding

Core Funding or Internal Support

Management Strength

High, Medium

Magnitude of Funding

Less than £100,000

In summary, while broad analyses exist specifying the nature and approaches to coastal zone planning in developed countries and to a lesser degree world wide, the elements of Tanzanian planning are highly dependent on a rational grasp of that nation's particular situation--physically, economically and culturally, in order to approach the planning in a mode demonstrated to be successful. It is to the goal of describing those factors, so critical to any in-country technical activity, that the bulk of this paper will be devoted.

It would seem somewhat naive to expect that applicable factors will be wholly defined and presented to any coastal planning effort by the involved nationals, because of, among other things, national pride, governmental politics, and lack of definition and recognition. It there-

fore becomes the task of the planning expert to determine and quantify factors, test against national information and attitudes in order to develop needed and successful strategies.

Tanzanian Background

The following material attempts to develop the Tanzanian national background sufficiently to provide insight into the particular in-country factors that bear heavily on coastal zone planning. This in-country study will be developed extensively because it forms the primary element that will determine success, and is one that is frequently under-evaluated in attempts to transfer technology.

General

The United Republic of Tanzania, the largest (193,082 Km²) and most highly populated (12.3 million people in 1967) of the East African countries, lies just west of the Equator between the natural, western rift-valley lake-system boundary and the eastern shore line, which fronts on the Indian Ocean (Simko, 1971). The northern boundary with Kenya and Uganda is routed around Mount Kilimanjaro (a birthday gift from Britain's Queen Victoria to Kaiser Wilhelm of Germany) through Lake Victoria (Berry, 1971). To the west Rwanda, Burundi, Zaire (the Congo) and Zambia interface, the latter two through Lake Tanganyka. The two remaining of the eight adjoining states, Malawi (across Lake Nyasa) and Mozambique (along the Ruvuma River), lie to the south. Offshore the

three islands of Pemba, Zanzibar, and Maria complete the national territory.

Although a border dispute with Malawi over the Lake Nyasa boundary exists, as do border incidents and normal frictions with Uganda and others, the governmentally proclaimed tenor in East Africa is for continued emphasis on unified positions and integrated commissions, universities, legislative bodies as well as other facilities and services, especially between Kenya, Uganda, Tanzania. Historically, the control of all three by Great Britain from 1918 to Tanzania's independence in 1961 has contributed strongly to these interrelationships which the present national administration under President Nyerere continues to advocate publically. Union with Kenya was even contemplated at the time of Tanzanian independence (Berry, 1971).

An East African Community Treaty in 1967, resulting from a Danish review, centered control of East African economic and banking interrelationships at Arusha, the new inland post-independence capital of Tanzania. The initial northward orientation of the alliance has been broadened by the addition of southern and western member nations. Zambia's sea link is being developed through Tanzania's principal port of Dar es Salaam, while Mozambique still provides an "isolating" frontier where Africa's few

remaining colonial and minority governments interface with the independent African states. Links with the western boundary nations of Zaire, Rwanda and Burundi are far more tenuous, based primarily on differing histories, distance, and lack of communication facilities (Berry, 1971).

Physical

The continental extremes in elevations, Mount Kilimanjaro (5950 m) and the depths of Lake Tanganika (358 m below sea level) lie close alongside. The coastal physiographic regions lie below the 200 m contour, along with the Rufiji and Ruvu River flood plains and the offshore islands. The rest of the country, above 200 m, rises slowly to the west into the high plateaus of central Tanzania (900 to 1500 m) which tend to be higher to the north. The topography includes inselberg-dotted, sloping, gently undulating, stream-dissected repetitive countryside. To the west, along the lake borders, river basins cut into the landscape. To the south, rounded granitic hills are prevalent, leading to narrow valleys. Over 40 percent of Tanzania's lands are underlain by three billion year old Pre-Cambrian sedimentary and metamorphic rock. Another 25 percent is covered by

comparably aged plutonic rock, including some of the world's oldest (Pemple, 1971).

Other prominent features include a north-eastern volcanic mountain chain featuring the 5950 m high-active Kilimanjaro and the 4600 m Mru. A pair of fault-block mountain ranges, the Usambras and Pares, which overlook the verdant seaward-facing Pangani valley add to the spectacular countryside. The central region boasts the Ngorongoro Crater, an impressive game refuge in the world's second largest caldera. The westward-flowing Great Ruaha River and its spectacular gorge to the southeast of the giant, still developing, western rift-faults scarp zone and its lake beds, together with the alluvial flood plains of the main river systems, are other major inland features (Berry, 1971).

The rivers of Tanzania are not large compared with the major global systems. The Rufiji, the largest of Tanzania's rivers and the only major deltaic river in East Africa, flows at less than 1/3000 of the Congo's rate, into the Indian Ocean (EAMFRO, 1965). Four major river basins (the Indian Ocean, the Nile through to the Mediterranean, the Congo into the Atlantic and the interior complexes) handle the flow of all Tanzania's rivers.

Five of the major rivers drain into the Indian Ocean. In sequence from north they are the uniformly flowing Pangani, the Wang, the Rufiji and, forming the southern frontier, the Ruvuma. Typically, the rivers' peak flows occur in April and May and are highly variable (Berry, 1971).

Coastal Zone

The Coastal Region starts inland with low hills and plateaus, overlying highly stable Pliocene to Jurassic rock which leads down to coralline terraced cliffs and sand beaches. Mangroves fill inlets and river estuaries, hindering coastal access. Offshore, erosional platforms or shelved fringing reefs lead to channels, which mark the beginning of a complex zone of scattered coral reefs and occasional sandy islets. The reef zone widens to the south to parallel the widening Continental Shelf.

The East African shelf area which contains these features is one of the smallest in the tropics, 4500 square miles above the 100 fathom line spread along 500 miles of seacoast (EAMPRO, 1965).

The islands of Zanzibar and Mafia lie well within the 100 fathom Continental Shelf contour, separated from the mainland by approximately 25 to 75 foot deep channels. Faunal distributions indicate that Zanzibar

was at one time clearly attached to the continent. The 640 square mile island (53 miles long by 24 miles wide) is separated by 22 1/2 miles from shore. The geologically older island of Pemba, 25 miles to the north east of Zanzibar is somewhat more isolated by deeper channels (270 to 400 feet) in the narrowing shelf. Pemba is 42 miles by 14 miles (380 square miles). Neither island exceeds 400 feet in elevation. Both have fertile areas and were once wooded (Tanzania Today, 1968).

Mafia Island, 15 miles directly offshore from the extensive Rufiji River delta system, is approximately 32 miles long by 10 miles wide and is supplemented by an extensive system of minor islands and reef areas (Ray, 1968). Tutia, a typical reef to the south of Mafia, was described in detail both physically and ecologically by Talbot (1965).

The northward flowing East African current, 50 to 100 meters deep, the western arm of the Indian Ocean gyre, spawned by the northern equatorial current, dominates the coastal and offshore flows. During the northern winter months, November to March, a northeast monsoon tends to slow the African coastal current to 1/2 to 2 knots. The stronger May-to-October southeast monsoon accelerates the current to 4 knots. Lower velocities and variable flow

directions are common within the individual reefs and along the shores (Talbot, 1964). Spring tidal range at Mafia is close to 12.4 feet and at Neap, 4.2 feet. The slight westward wind and current components resulting from both monsoons tend either to produce downwelling or at least prevent upwelling. General area productivity in the offshore surface layer tends to be reduced. Richer biological zones occur inshore in the reefs, due to availability of detrital material, as well as in the sub-surface currents offshore (EAMFRO, 1965).

Seasonal variations in rainfall and evaporation dominate the other climatic elements impinging on the coastal zone because of the overriding effect on agriculture and consequent population distributions. Rain in the tropics falls as convergences cause moist air to rise and thereby drop in temperature. Typically, the meeting of the northeast and southeast air streams is called the Tropical Convergence Zone. The resulting rain-belt, which can be found in January to the south of Tanzania, moves northward throughout the spring, in response to the overall weather system's shifting highs. The summer sees the rainbelt, now far to the north, start its southward return. Thus, the southern border

of Tanzania sees a single yearly rainy season while the middle and north country is exposed to two (Jackson, 1971).

Wide variations in Tanzania's generally stable climate can occur with changes of altitude resulting, for example, in a temperate climate on the slopes of Kilimanjaro. Apart from this altitude effect, temperature variations at seas' edge are slight, 4^o to 6^o centigrade about a mean of approximately 25^o centigrade. Yearly peaks closely parallel those already described for weather. In Tanzania's largest seaport, Dar es Salaam, situated midcoast, the sun shines 2800 hours per year, ranging from 5.3 to 9.1 hours per day (Jackson, 1971).

Historical

Tanzania's history starts with the advent, or descent, of the earliest man, depending upon one's point of view. Oldevai Gorge, near the Ngorongoro crater in north central Tanzania, is the site of the earliest known man. The fossil bones of australopithecines attest to the presence of the two-footed near-man on the grasslands and savannahs of Africa about 2-1/2 million years ago. Several stone-age cultures followed, with hunter rock-paintings and burial cairns prevalent (Sutton, 1971).

Iron-working peoples populated many inland sites in the first millennium A.D. This product, combined with the output of salt-working sites a century later, led to early trade which supplemented the predominately agricultural subsistence economy. Pre-Christian era trade existed with Egypt, Arabia, India and China, as indicated by archaeological finds. By the 8th or 9th century Muslim trade for smelted iron, carved ivory, minerals, cloves and slaves was heavily underway. Islamic culture accompanied the traders. Heavy tarriffs, as well as trade profits, financed population-center construction (Davidson, 1966).

Ruins at the present small coastal town of Kilwa, south of Dar es Salaam, chronicle in stone the sequence typical of early Swahili island and coastal city-states such as Kisawani, Kunduchi, Zanzibar, Pemba, and Mafia (Dato and Sheriff, 1971). The sequence includes a 13th-to-14th century native palace, a 15th century mosque, a 16th century Portuguese fort, and finally overlying Omani Arab constructions.

When the Portuguese under DeGama first explored the East African ports in 1497, the operation and the trade networks were at their zenith. The Portuguese in typical fashion, first observed, then recorded their descriptions, prayed over and subsequently plundered,

burned and destroyed the cities. An attempt to replace the Islamic trade with their own failed, primarily due to lack of capital and capacity. The Dutch, for a time, succeeded them but quickly neglected the area to explore the Far East (Davidson, 1966).

Slave trade expanded from 10,000 per year during the early years to 45,000 per year under the Omani Arab domination in the late 1700's. Slave trafficking set native group against native group far into the country. Eventually a not-to-be-forgotten fear and hatred was established for whites, who generally organized and profited from the trade well into the mid 1800's. Coffee, sugar and spice trades, predominately coastal, were also developed during this period. In time the slave trade depleted the labor supply and the plantations failed. The remaining Portuguese moved to other areas of Africa or on to South America at this time (Davidson, 1966). Trade with the interior was severely limited, not only by communication difficulties, but also by the need to traverse a meager rainfall zone heavily infested with the deadly tsetse fly (Datoo and Sheriff, 1971).

In the late 1830's, German colonial interests under various guises usurped native and Arabic control. Uprisings led to strong German government control and the start of European colonial domination. With characteristic organizational ability the administration of the entire country was undertaken with the minimum of manpower and equipment (Mascarenhas, 1971).

The control span of the existing chiefs was solidified. The majority of the Administrative District Capitals established at that time have survived to become Tanzania's major towns. Telegraphic and railroad systems communicating with the interior were established at Dar es Salaam focusing sea trade at this comparatively new port. Steamship service from Hamburg, as well as coastal and lake shipping systems were instituted prior to 1900. Railroad construction was paced by vehicular traffic limitations. Large plantations of sisal (a hemp-like rope-making material), rubber, and coffee were in high production. Agri-biological institutions were established. Much good land was alienated by Europeans for profitable enterprises. Little direct benefit accrued to the native population except through missionary contributions to health and education (Mascarenhas, 1971).

The World War I conflict was resolved in 1918 with control of the majority of East Africa, including

Tanzania, given under a League of Nations mandate to Great Britain. The Germanic districts were re-organized to make better use of the stronger chiefs. Central government control was emphasized only in areas with deficient local government. Tribally-oriented Districts, with some adjustments in numbers, were grouped into Provinces, typical of the British colonies. Legal recognition was given to the status of the chiefs. Native courts and treasuries were established and together formed the main elements of indirect rule (Thomas, 1971).

Britain's role as guardian of a League of Nations mandated territory evolved into a United Nations trusteeship. Independence was achieved in December 1961. Julius K. Nyerere became the first president of the then Republic of Tanganyika in 1962. Zanzibar was absorbed in 1964 after a revolution deposed its Arab minority Sultan. Tanzania was thereby formed (Simko, 1971).

The new nation became a United Nations member, joined the British Commonwealth and the Organization for African Unity. It is now both a Socialist state with strong ties to the People's Republic of China and the Scandinavian Socialist States, as well as a center for African liberation movements (Berry, 1971).

Population

Tanzania's 12.31 million people (according to a 1967 census), 11.96 million on the mainland and Mafia Island with the remaining 355,000 in Zanzibar, exceeds numerically the population of her close neighbors who are small but highly populated. Kenya has 9.95 million and Uganda 7.93 million (Demographic Yearbook, 1968).

Her population density of 13.9/km square is slightly over the average for Africa. Of eleven of the most populous African countries, she ranks fourth from the lowest in population density. Even lower densities occur in the comparatively large countries of Zambia, Zaire and Algeria.

Regional distributions of Tanzanian population are relatively even, though individual areas and densities vary widely. High population densities are found on Zanzibar, Pemba, as well as along the coastal and international frontiers. Population is especially concentrated to the north. In all, 2/3 of the area carries less than 1/4 of the population. Another 25 percent of the population occupies only 5 percent of the area.

The nation is predominantly rural even though over 1/4 million of Tanzania's 830,000 urban inhabitants are found in Dar es Salaam.

The urban population contains a high percentage of non-Africans, especially Indians, who fill the merchant-entrepreneur class void between the agriculturally-oriented, comparatively untrained natives and the college-educated intelligentsia who generally can be found filling top government slots. In 1957, Africans made up 98.4% of the total population, with Asians only 1%, Arabs .22%, and Europeans and others .23%. (Thomas, 1971).

Growth rate of populations in East Africa has been difficult to determine with any certainty. First count was made in Tanzania in 1948. With increasing efficiency of count, as well as true growth, it is difficult to attribute the total numerical change to one or the other cause. The currently projected geometric growth rate of three percent per year results in population doubling every twenty-five years. Principle reasons set forth for the apparent population increase include a decreasing mortality, especially close after birth, coupled with a continuing high birth rate and heavy area in-migrations. Differential growth, predominately in areas of highest population, can be seen. The

coastal and offshore islands are in the leading group with excess population (Thomas, 1971).

Because a population surplus relative to employment exists in the coastal zone, Tanzania is actively engaged in attempting to encourage more uniform relationships between population distribution and agricultural/industrial capacity. Increasing industrial production and cash income, food production and yield, providing differential encouragement to industrial and service segments and promoting out-migration to under-utilized areas are all being implemented (Thomas, 1971).

Population redistribution is complicated by two underlying factors: tribalism and language. The four major African language families are represented in the north central area. The bulk of the rest of the country, with 95 percent of the population is covered by people speaking approximately one hundred varieties of the Bantu language (Sutton, 1971). One of the Bantu languages, Swahili, has generally replaced these dialects and is rapidly becoming the national language. English is encouraged and dual language capability is typical in the populated area (Tanzania Today, 1968).

Tribal areas are extremely important in the organization and distribution of people. Tanzania's more than one hundred substantial tribes still live quite differently from each other based heavily on variations in employment, religion, traditions, and habitat (Thomas, 1971). Although tribes have been incorporated organizationally into the government structure, as noted above, the current trend toward a more socialistic regime appears to include little unilateral power for the tribal hierarchy (Second Five Year Plan, 1969). Rather a strong drive toward self-reliance and cooperative enterprise is stressed. In general, however, in Tanzania, and most of East Africa, the polarization into tribes does not prove to be a substantially divisive influence (Thomas, 1971). Neither apparently does the tribal overflow cross international borders. Another useful population breakdown, based on economics, shows among other things some basis for projections of population distribution and growth. In a study by Young Sing (1971) based on 1967-1968 statistics, the distribution of income as related to population density is reviewed. Among its revelations are that the large and medium size holdings are of great importance to the agri-monetary sector, the identification

of the development obstacles presented by pastoralism and the split between the northern coastal high-income sisal-based economy and the south coastal low-income agricultural-based economy. Recent sisal price drops due primarily to synthetic competition have lowered the immediate income potential of the north coast.

With 44 percent of Tanzania's population under 15 years old, considerable costs must be devoted to education and health services with no immediate productive return. A low sex ratio of 95 males/100 females has been a permanent feature of her population. The ratio drops as age increases from birth mainly due to differential mortality favoring the male. The curves suggested by horizontally stacked paired male/female survival histograms are concave upward with increasing age typical of high growth rate areas. Within the average, wide geographic area differences exist. Most coastal areas and other population centers such as Pangani (1.22) and one Tanga district (1.5) averaging overall 1.15, far exceed inland areas sex ratios (.75 to .85). The coastal areas south of Dar es Salaam, Rufigi and Kilwa are also centers of male in-migration. Male surplus in the coastal areas are attributed partly to in-migration of adventurers/entrepreneurs seeking financial improvement (Thomas, 1971).

Governmental Organization

Seventeen mainland regions, renamed Provinces, are now united in a single state governed under a single-party Socialist aegis. Zanzibar and Pemba are separately and more restrictively governed. At the local level, district councils and independent town councils provide educational, social and economic services. The City of Dar es Salaam and the municipality of Tanga, separate TANU (National Party) Districts, are similarly organized. Elections for ward representatives follow the parliamentary pattern (Cliffe, 1971).

The key elements in Tanzania's administration are the sixty-one Districts, which in 1969 were still grouped into substantially the same regions established under British rule. As mentioned above, they reflect tribal and ecological units but to a variable extent. Some complications have resulted from differences in tribal and political loyalties, recent divergent trends in development, and excess population or land area. For instance, the largest districts, 64 Km² square in area or approximately 500,000 population, are as large as some independent African states. In some areas homesteads rather than residential centers predominate. This, together with poor communication, taxes the limited District officials' management capabilities (Cliffe, 1971).

While the District is the basis for both party and parliamentary constituencies, Central Government control in the country is conducted through the offices of Regional Administration by Regional Area Commissioners. These regional officers coordinate government services, provide general administration, act as ex-officio members of Parliament and party secretaries as well as members of the party's National Executive Committee (NEC). In 1969, a parallel lower order administrative/party functional level was established as Divisional Secretaries. Other government departments now have field offices at the District or Regional levels or below (Second Five Year Plan, 1969).

The Tanganyikan African National Union (TANU), the single national party, consists of both elected and appointed officials who appear at all government levels down to sub-levels of the village. Among the functions of the TANU officials are to provide a demand/information channel from the people to the top governmental levels and to assist agencies in the organization and direction of the people in enhancing area development. TANU also provides and supervises the arena in which competitions for all governmental elective offices are held (Cliffe, 1971).

Parliament consists of over one hundred elective members. Eligibility requirements include TANU membership, which in turn requires adherence to Socialist doctrine and demonstrated lack of interest in private business. TANU branch representatives vote and in essence nominate the top two district, or sub-district, candidates, one of whom is then elected by popular vote to parliament. Parliament also has members who are, to all intents, appointed. While some members in this category hail from the mainland, the total representation from strife-torn Zanzibar is appointed in this way (Cliffe, 1971).

The governmentally established and controlled cooperative Movement Marketing system dominates the internal economic scene and helps to assure indigenous control of the economy. By 1967, the 1650 governmentally registered Cooperatives, double the 1961 quantity, handled four times the 1961 tonnage. While most export, and substantial internal, consumer good crops are controlled by the Cooperatives, local consumption needs often are met by illicitly marketed goods (Larsen, 1971).

The Cooperative hierarchy starts with a Society of primary producers which receives, pays for and stores the product, while providing some producer capital. The Society is in turn funded by a cost compensatory tax. The

unit costs of compulsory participation to members are lowered as volume increases. On the next higher echelon, Unions of Cooperatives coordinate sales, distribution and transport. A levy is again applied. Levies which exceed costs may be returned to the members or invested in processing or development. The top echelon unites the thirty-three Unions (in 1968) the Cooperative Union of Tanzania (CUT), a powerful political and administrative body.

Poor success of the Cooperative Marketing System at the lowest interface, caused by all levels, has been attributed to high operating costs, low product price, inefficiency, dishonesty and lack of trust, complicated by adverse world market conditions. Governmental assessment of the problem has led to constructive steps to improve the system and increase producer confidence (Larsen, 1971).

The Ujamaa, socialist-cooperative villages described in Landberg and Weaver, 197 , which were established to fulfill the intent of the 1967 Arush Declaration have as their objective the development of "economic and social communities where people live together and work together for the good of all." (Nyerere, 1968).

Kigombe, a long-established coastal fishing community, recently named a Ujamaa Fishing Village in

accordance with the Second Five Year Plan for Village Fishing Units, also receives funding from the Tanzanian Agricultural Credit Agency to its Kigombe Fishermen's Association. The complex interrelationships at the performance level between government, TANU, tribal, family, and business enterprises are described in depth in the Landberg and Weaver work. Any attempt to effect coastal zone change or regulation must take full account of these interrelationships and the extensive traditions and social behavior upon which they depend.

Economic Status

Before examining national goals an assessment of recent economic posture appears in order. In Tanzania the Gross Domestic Product (GDP), an approximation of the sums of incomes earned by production, peasant-labor and capital factors, less subsidies and indirect taxes in 1967 was 5.96 billion shillings, or 580 shillings per individual (one shilling equals .14 U.S. dollars). GDP growth has been 4 percent at constant prices, with a 3 percent or more population growth through 1970. However, little growth has occurred in the subsistence sector which does present a discouraging picture for the rural population.

In fact, Jenson (1971), reports no probable growth in rural GDP per inhabitant at constant price.

Rapid growth, however, has occurred in Dar es Salaam where over 20 percent of the national GDP is earned. Eight primarily coastal and northern districts of sixty-one total districts, including Dar es Salaam, account for 50 percent of the GDP. Product per inhabitant ranges widely from 4200 shillings in Dar es Salaam, 1200 in Tanga and less than 200 in poorer inland areas. However, estimates of most GDP sectors are somewhat questionable, especially the agricultural sector due to unreliability of district production figures and the requiring compensating approximations. Individual district totals tend also to be somewhat questionable. The effects noted from heavy capitalization and earning concentration in the northern coast and border areas, however, lie well outside any error limits.

The overall trade balance was unfavorable from 1947 until 1961. Subsequent to 1961, it has remained favorable between 60 million shillings and 330 million shillings, averaging 175 million shillings through 1967. A steady increase in all sectors resulted in reaching the following totals for 1967: 1625 million shillings imports (1345 foreign, 280 East African), 1760 million

shillings exports (1645 foreign, 83 East African), total trade 3385 million shillings resulting in a favorable balance of 135 million shillings (Mascarenus, 1971).

Tanzania's present trade balance with Europe is unfavorable, 12.5 million pounds imports versus 2.7 million pounds exports, and is heavily concentrated in manufactured good imports from the United Kingdom, Italy, France, West Germany and a half dozen others. A favorable balance with the Far East, 6.4 million pounds export versus 1.6 million pounds import, is concentrated in Hong Kong, Indonesia, Singapore and Siam. China is the fifth largest among the nations showing unfavorable trade balance.

In general many of Tanzania's biggest consumers also bear unfavorable trade balances such as Hong Kong, India, Canada, United States, Italy, West Germany, Japan and France. Trade with Socialist countries has increased over twenty-fold since 1961.

The overall trade volume tripled within the 1947-1957 decade and has doubled through 1967. Per capita trade increased from 62 shillings to 276 shillings over the same total elapsed time. The Commonwealth is the largest trade partner, accounting for approximately 60 percent of the exports in 1967.

National Goals, Objectives and Performance

A convenient summary of currently proclaimed Tanzanian national goals can be found in the Second Five Year Plan for Economic and Social Development-1 July 1969 - 30 June 1974. In the lucid text of a quoted speech by President Julius K. Nyerere to the TANU Conference on May 28, 1969, the following areas were highlighted:

East African unity

Basic national policies as stated in the Arusha Declaration of 1967

Economic growth which will bring benefit to all

Socialism

Self-reliance in the Ujamaa Village concept

National objectives

Adequate and balanced diet

Good and attractive clothing

Decent housing

Educational opportunities

First Five Year Plan problems and lessons

Underachievement of economic growth (4.3 percent achieved growth, vs. 6.7 percent planned)

Disastrous price drop of sisal in the international market

Failure of the Tanzanian Trade Agency

National Development Corporation, the major promoter of large scale socialist production, still in its infancy

Rhodesian minority declaration of independence necessitated major planning revisions

Lack of adequate national statistical information, especially in estimated population growth rates, (2.2 percent per annum predicated vs. 2.5 percent experienced) required retargetting of plans

Incomplete Socialist Doctrine definition (since offset by the Arusha Declaration of 1967)

Management system encouraged slow project start and inflexibility in redirection for desired project changes

Priorities for Second Five Year Plan

Educational effort must shift from secondary teacher training in the university to expansion of the primary school system. (In 1964 only 46 percent of the children had the opportunity to go to school). Concurrently the failure to obtain the desired output of university science graduates, which, if continued, would force Tanzania into a continuing backward and dependent role, must be overcome.

Production growth successes, while substantial (10% per annum), were well under planned level (14.8% per annum). Development of a long-term industrial plan aimed at the

East African common market and export is necessary and should be implemented by the start of the Third Plan.

Labor-intensive small-scale industries are highly encouraged, because of low capital requirements, wider distribution of income and transmigration of labor to rural highly-populated areas (i.e., the coastal zone).

Investment in industry is to be concentrated in the private sector. The 16% investment in the private sector should be directed toward small-scale projects.

Agriculture is to be substantially revamped to continue withdrawal from the disastrous sisal project and to invest resources in production of other crops and livestock. Food, its production and local consumption, is of great importance in national survival. Opportunities have been consistently missed in planting, rearing and diet balancing. The state of health of the people has been heavily penalized, especially the young.

The "transformation approach" emphasized in the first plan, where the government financed highly technical/mechanized settlement schemes, has been abandoned in favor of the Ujamaa Village concept. People are to be discouraged from performing farming duties, i.e., plowing or transport, that can be accomplished with oxen or donkeys. Continued development emphasis nation-wide on expanding numbers and effectiveness of Ujamaa Villages is paramount. Caution is required and expectation for material help should not be the primary inducement, rather the need for collectivization.

Rural emphasis means reduced urban improvements. Money, especially capital, will be in short supply. Assistance will be available only where labor and local resources cannot suffice. Industrial decentralization to new urban growth centers will hopefully spread industrialization while still allowing sufficient concentration for cost advantages.

Economic transformation from export domination to creation and servicing of a rising local market is emphasized. Exports for foreign exchange are still highly encouraged. In other words, income from exports should be spent for local production which, while not sophisticated, should be of necessarily high enough quality.

The building and servicing of communications, road and other transportation systems presents the difficult choice between new starts and continuing and improving existing and functioning installations. Kilimanjaro Airport is singled out for its tourist value and the TANZAM (Tanzania to Zambia) railway system for copper transport.

Cost effectiveness and efficient resource allotment are stressed. While profits provide a substantial measure of desirability, some enterprises must be subsidized for other national purpose such as employment, skill availability, etc. Moderate research support for industry, agriculture, commerce, and administration are planned, with emphasis on improved quality, administrative efficiency and self-discipline.

While an overall assessment of in-country progress against achievements of the Five Year Plan goals probably will not be available until the advent of the third Five Year Plan, some feeling for the general state of national progress can be obtained from summary periodicals, i.e., African Diary, African Affairs, and United Nations assessments. Some significant items include the following:

Fifty-four foreign governmental loans, totalling 3.4 billion shs., from 1964 through 1970, include 12 interest-free loans (5 from Peoples Republic of China, 6 from Canada and 1 from Denmark). Aggressive efforts continue to seek loans for Five Year Plan projects. Heavy aid from People's Republic of China (African Diary, 1971)

Efforts continue to establish investment interest in Tanzania. SIFIDA Investment Company, a multi-national finance company which is made up of British, French, Swedish and West German private investment sources and was established for joint industrial agri-business sector projects/ventures with either government or parastatal organizations. Other similar organizations such as International Finance Corporation, Commonwealth Development Corporation, and Corporate Development Finance Company hope to lure investors back into relatively high risk African ventures (African Affairs, 1971).

Internal troubles in Zanzibar continue with Arab attempts to regain lost power.

Take-over of private business continues.

Continued low sisal prices, agricultural problems and technical obsolescence have accelerated industry close-out.

Financial resources are the major constraint to economic expansion. Foreign borrowing not enough. Bankers warn government about proceeding on development without money in hand.

National Development Corporation income up 59% in 1970.

President Nyerere sets water system, school and medical facilities priorities ahead of road surfacing required to maintain communication network.

Trade volume up 20%. Major increase in imports. Balanced trade deficit grows.

Growth rate still low at approximately 4.5% per year but rising.

(Above seven items are from African Diary, 1971)

While far from complete, the picture that emerges from these and other source materials indicates isolated successes, but points toward continued difficulty in meeting many planned objectives. Extreme difficulty in obtaining capital from any source, in achieving reasonable levels of national growth and earnings and a heightening of the trauma involved with choosing between necessary, primary national requirements continue. The net result of continued dependence on foreign aid, especially from the friendly Socialist countries, appears to be a necessity for survival and growth. Further growth acceleration is required downstream, in order to offset inability to achieve present Plan performance.

Major Coastal Zone Conflicts/Compatibilities

A high degree of synergism and complimentary advantage will result from the initial activity expansion especially into relatively unexploited coastal areas. The advantage in resolving what conflicts do occur will probably lie with the intruding element typical in the early development of the American West. However, given sufficient time, organized resistance will form precipitating substantial conflict, whose resolution can result in retrenchment or reduction of forward momentum in national progress, unless orderly means for equitable solutions are developed and implemented. This conflict situation already exists in Tanzania's highly developed port of Dar es Salaam and to a lesser degree in other developing coastal sites. In many undeveloped areas little conflict exists in the stabilized cultural physical situation. However, coastal zone conflicts are eventually assured for the entire Tanzanian coast in some time phased manner. The conflicts will be enhanced by the need for rapid development for national survival resulting from continued slow progress. Some major areas believed to be involved in this mutual compatibility/incompatibility conflict are described below. All can be expected to interact to some degree with each other as ameliorated by time and geographic location.

Shipping/Trade/Communications

Coastal trade and transport growth is inevitable given increasing trade projections from the TANZAM Railway, upped quotas in industrial production, the emphasis on obtaining capital by continuing to improve the trade balance and the increasing coastal population concentration.

Tonnages handled by Dar es Salaam have already increased from 905,000 to over 2,128,000 during the three year period from 1965 to 1968. Navigation improvements required for traffic control, deep water berths, and containerized cargo sites are under construction. Increased petroleum, the principle Tanzanian import (two times the total export tonnage), needed for the oil refineries in Dar es Salaam and the Zambian petroleum pipe line are necessitating installation of an offshore terminal (Mascarenhas, 1971).

Two other ports, Tanga, a 320,000 ton capacity lighterage port to the north, and the deep water Mtwawa, with 400,000 ton capacity, close on the southern border account for the rest of Tanzania's ocean transport needs. Both have been recently developed to support unsuccessful agricultural schemes and are currently operating below capacity. Mtwawa's major export, cashews, exceeds her

imports by two to one (Mascarenhas, 1971). Neither Mtwawa nor Tanga, which sandwiched in between Dar es Salaam and Mombasa Kenya are expected to show increases comparable to Dar es Salaam even though government influence is being applied to decentralize capacity. Infra-structure, including feeder roads, railways, and storage facility improvements should also contribute to tonnage increases (Dirlam and Carpenter, 1969).

Industry/Parastatal Development

Heavy and diversified industrialization including both large and small operations are being highly encouraged within the Coastal Zone. The self-reliance concept, the concentration of Ujamaa rural development areas and the highly populated rapidly increasing coastal population centers require a geographically dispersed industrial capability which generates a need for construction and services. Parastatals and cooperatives likewise are predicted to both grow and proliferate within the Coastal Zone. Water resource developments, sewage disposal, and increased crop irrigation to support increased agricultural efforts will likewise have to grow. Coastal pollution, especially near highly utilized ports, will

follow, adding industrial chemicals, fertilizer, and insecticides into the coastal waters.

Hydro-electro power systems will effect coastal fresh water flow. Other coastal power plants will prove to be sources of thermal pollution. A 15 percent yearly growth in power capacity occurred from 1953 to 1957. This growth rate must increase substantially to meet the increasingly accelerating needs. Surveys to determine whether minerals, including oil and sand, may be present in commercial quantities in the offshore areas are required.

Recreation/Tourism/Conservation

Recreation and tourism have been one of Tanzania's more significant sources of favorable foreign exchange, reaching in 1970, 140,000,000 shs. gross against a 40 percent outlay. In 1968, visitors to Tanzania totalled 40,000 (60 million shs.). By 1973, 120,000 are expected (140 million shs.). Dar es Salaam accommodated 50 percent of these tourists. Many visited both inland game refuges and coastal resorts. Expansion of coastal resorts is expected as air facilities are improved.

A marine reserve program which will hopefully conserve selected elements of Tanzania's better reef areas for present and future tourists and recreational use while permitting controlled fishing harvests is being considered (Saila, 1968).

No effective nation-wide shoreland conservation program is known to be in existence.

Fisheries/Aquaculture

Fisheries, both subsistence and artisanal, are expected to expand due to population pressures, increased per capita consumption, increased use of processed fish parts, marine training, research and equipment improvement, and added emphasis on Ujamaa Village marine fishing units. Infra-structure improvements will facilitate growth. Drying, icing, and processing facilities, marketing and transport systems, improvement in boat-gear, engine-hardware and maintenance may be expected. In the overall, approximately 3 plus million shillings were planned for development in 1972.

Twenty percent of Tanzania's catch is obtained from the Continental Shelf. Prediction of improved fishing catch from the Shelf range from four times (Marshall, 1972) to ten times (Second Five Year Plan, 1969). Addition of an ornamental shell fishery may be expected.

The 1974 Law of the Sea 200 mile extension for living marine resources will no doubt encourage development of offshore commercial fisheries. The development of these fisheries may be expanded by non-Tanzanians who could post

1974 Law of the Sea be required to pay subsidies and land and process their catch on Tanzania's shores (Knight, 1972). Eventually increases in capital, trained manpower, and national interest should dictate Tanzania's takeover of the offshore operations.

Mariculture potential, especially in the brackish water of the southern mangrove area (Mattheson, personal communication) is a decided possibility in the near future but only where highly tolerant organisms may be reared under labor-intensive low-capital and primitive technology. Seaweeds have also been mentioned for commercial harvest and culture. Conflicts at sea, shore, and within the estuaries can be expected.

Increased Coastal Urbanization and Exploitation

As coastal pressures rise, restrictive legislation can be expected to insure meeting and upgrading of the general health and welfare requirements of the coastal citizenry. Likewise, marine educational desires will compete actively for limited coastal zone funding programmed for less essential supporting projects, facilities, and equipment.

Post Law of the Sea Regime

In addition to the Law of the Sea effects on fishing, a workable solution with regard to off-shore research and exploration by foreign vessels will probably result in a requirement for monitoring and on-site observation. At the same time, an opportunity will be provided for effective technology transfer. A strong base of marine scientific personnel must be available for assessment of foreign intent and assimilation of new technology providing yet another conflict for zonal resources.

Law Enforcement

Coastal zone law enforcement involving Tanzanian national problems such as theft, reef dynamiting, and controlled fishery regulation enforcement, offshore control of foreign entry, and military operation are additional sources of conflicts.

In studying conflicts between all of the above areas and their multiple interrelationships certain underlying factors are implicit and must be considered. These factors include land use, zoning, regard for ownership (government or individual), property evaluation, jurisdiction, socialistic principles, and social and cultural preferences. Any attempt to deal with Tanzanian coastal planning must be structured to accommodate them.

establish the legal and decision-making processes and to set objectives for coastal zone management against future requirements? In the author's opinion there probably are some advantages to becoming knowledgeable in current techniques, Tanzanian implications and in establishing cost/benefit projections implementing selected small-scale pilot operations in areas representative of future problem classes. The three pilot areas that seem appropriate to consider are:

- (1) The most advanced major port at Dar es Salaam which can serve both as a pilot for future harbor development sites as well as having many present conflicts that can benefit from proper planning.

- (2) A coastal Ujamaa Village complex relatively near to a developing port such as Kigombi, near the port of Tanga, in which social-cultural-economic village development considerations can be related to growing coastal capability.

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- (3) An offshore natural-resource/
artisanal-fishery development
area such as a segment of the
Mafia Island reef complex being
considered for both marine reserve
use and fishing exploitation.

For each element of these areas, which
together represent urban, rural and natural settings,
the general approach should include the following factors
and problem descriptors, adapted from

Cause-Environmental Condition-Effect

Natural environmental characteristics

Reason for dissatisfaction

Incidence of cost, damages, dissatisfaction

Intensity or severity of problem

Geographic location of problem

Time description of problem

Governmental, administrative jurisdiction

Social, cultural involvement

Technical consulting, foreign and local, available

Funding, foreign and local, available

Cost/benefit analysis over time showing both
magnitude of problem and expected crossover.

Planning Recommendations

With Tanzania's escalating coastal zone growth and increasing incompatible multiple uses, there is little doubt that effective coastal zone planning will in the long run be beneficial. At this time, however, Tanzania has neither the financial excess and technological skill, nor can she put up with any slowing down of development that might be involved with environmental, or any other coastal zone control, to consider any sort of an overall national coastal zone control effort. Even if money were to be supplied her by outside agencies, it could be put to far more effective use in accomplishing currently deferred necessities.

In the Stockholm Conference, the developing countries, especially Tanzania, make the point that they must be permitted the right of unfettered exploitation in order to survive and narrow the techno-economic gap with the Advanced Countries.

Is there any advantage to the country to become aware of and apply techniques of Coastal Zone Management; to setup information gathering on the pilot scale; to identify participants and their viewpoints; to devise techniques for adequate interest representation; to

After analysis of effected sub-sections in each of the area elements are made, a relative ranking should be attempted. The ranking should be made using weighting factors set by the three localized coastal zone planning groups responsible for the studies, and should be widely discussed, perhaps in an internationally convened seminar prior to the spending of any resources for problem resolutions.

This approach, especially if internationally sponsored, could result in development of Tanzanian coastal capabilities, with a minimum of country resource commitment, early enough to permit judicial involvement with on-going processes on a cost-effective basis as desired, in consonance with State needs. A high degree of local control and participation in the establishment of patterns of development of minimal Coastal Zone control required at different levels of complexity and different geographical locations should ensue. Non-national interest in environmental and coastal control in the developing countries can be evaluated by the extent of their monetary participation and resource contribution in what could well prove to be an effective pilot approach for other developing countries.

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