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Water Law and Water Resources in Eastern Africa

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AND WATER RESOURCES
IN
EASTERN AFRICA

Julian C. Juergensmeyer
James B. Wadley
# TABLE OF CONTENTS

**CHAPTER I**

Introduction .................................................. 1

**CHAPTER II**

East Africa: Its Land, Natural Resources and People ............. 15

Kenya .............................................................. 41

Uganda .............................................................. 50

Tanzania ............................................................ 55

**CHAPTER III**

The Background Matrix of Water Resources .......................... 61

Race ................................................................. 62

Religion ............................................................. 71

Land Tenure ....................................................... 76

Political Development ............................................ 102

Economic and Social Development .................................. 120

**CHAPTER IV**

Water Law History ................................................ 147

Background ........................................................ 147

Uganda .............................................................. 154

Kenya ............................................................... 168

Tanzania ............................................................ 202

**CHAPTER V**

Kenyan Water Law Today ........................................... 219

Nature of the Water Right ......................................... 219

Acquisition of the Water Right ................................... 223

A. The Permit ...................................................... 223

B. Permit Procedure .............................................. 232
CONTENTS (continued)

CHAPTER VI Tanzanian Water Law Today .................... 242
                  Nature and Acquisition of the
                  Water Right .................... 242
TO
JANE, FRANCES
AND
TERRY WOOD
All of the field work research and library research in Africa for this study was conducted in the spring and summer of 1972 pursuant to a research grant from the International Legal Center. Without the financial support of ILC and the encouragement and counsel of John Howard, Gilbert Verbit, and Terry Wood of that organization this first comprehensive view of the water resources within a water law context in Kenya, Uganda, and Tanzania would still remain unaccomplished. Also essential to its fruition was the cooperation and assistance of (1) Dean Joseph Modeste Sweeney of Tulane University College of Law, since at the time the research was conducted Professor Juergensmeyer was a member of the Tulane Law Faculty and Mr. Wadley was a student at Tulane Law School, and (2) Dean Joseph Richard Julin of the University of Florida College of Law, since the report which follows was written while Professor Juergensmeyer was a member of the University of Florida Law Faculty and Mr. Wadley was Director of the Eastern Water Resources Research Center of the University of Florida College of Law.
The authors are also deeply indebted to over 100 water administrators, lawyers, engineers, hydologists, and government officials who granted interviews and gave assistance to the authors in Kenya, Uganda and Tanzania. No listing of their names is attempted not only because of their large number but also to avoid any implication that they subscribe to the views, interpretations and suggestions of the authors.

It should be pointed out to the reader that the report that follows is both tentative and incomplete. In the near future footnotes will be completed and chapters will be added on environmental law in Kenya, Uganda and Tanzania. Subsequent to that, a second part will be added which will contain materials on water law, water resources, and environment law in the Empire of Ethiopia.

JGJ
JBW
CHAPTER I
INTRODUCTION

Of all the dark corners of the Dark Continent, East Africa has probably been the most obscure. While only a hundred years ago the whole continent held secrets from European eyes and challenged the bravest and most venturesome of explorers, in East Africa the secrets were thought the most important and the challenges the greatest.

There, wild beasts of monstrous proportions had roamed in unfenced freedom long before Dr. Leakey's Zinjanthropus saw the dawn of man in the gorge at Olduval. They had to be hunted. There, jungle blended with plain and mountain stretched skyward lifting volcanic peaks to heights unequalled elsewhere on the continent. They had to be conquered. There, the largest and deepest lakes of Africa had to be discovered. There, the Mountains of the Moon had to be explored. There, the headwaters of the Nile had to be found. There, Killimanjaro had to be climbed.

Although long "dark" to Europeans, Africa was not without foreign
visitors. Fifty centuries ago, Egypt sent her caravans southward seeking ivory, ebony and slaves for her capital at Memphis. The Phoenicians visited often as did the Greeks and the Romans. Even China had contact with Africa a thousand years ago--one expedition returning with a giraffe from Kenya for the Emperor (who regarded it as a good omen). Arab traders early established permanent settlements and were soon well in control of the east coast. They travelled the monsoon winds in their dhows trading cloth, beads and ironware for slaves, ivory and other needed materials. Although the Arabs did not venture far inland because they depended on African traders to bring their goods and slaves to them on the coast, they managed to establish themselves so securely that even though the land was later divided between the British and the Germans, their culture and influence could not be displaced.

European penetration began with the Portuguese during the first half of the fifteenth century. They inched their way down the west coast under the direction of Prince Henry, the Navigator, and a trade
monopoly was established in West Africa as a result of Vasco de Gama's explorations. During the seventeenth century, England, France, Sweden, and Prussia challenged Portugal's domination as interest in the profitable slave trade grew. By the turn of the eighteenth century, Africa had a new master and England rather than Portugal called the tune and was the power with which other nations had to contend.

Opposition to the slave trade, initiated by the Quakers, and the rampage of the industrial revolution with its need for new markets and new sources of raw materials finally forced a wider interest in Africa; but not before more than twenty million Africans had been deported and another then million had been killed before shipment or en route to the Americans as slaves.

In the late 1790's Mungo Park, the first of the great explorers of Africa, survived the rigors of the quest to find the Niger River. By 1822, Hugh Clapperton was in Kano, the great market city of northern Nigeria. Timbuktu, although well known to the Moors as a center of scholars and the book trade, was also visited by the Florentine mer-
chant Benedetto Dei as early as 1470, and even brought to the attention of Pope Leo X barely twenty years after Vasco de Gama rounded the Cape of Good Hope in 1494. In spite of this, it did not receive its first visitor from northern Europe until 1828.

A wave of missionaries washed over Africa in the years that followed with such legendaries as Krapf, Steere, Rebmann, and the immortal Livingstone in the vanguard. During the second half of the nineteenth century the European explorers also began their assault on the heartland of darkest Africa. Burton and Speke reached Lake Tanganyika in 1857. Then Speke, with Grant, discovered Rippon Falls and the source of the Nile in Lake Victoria resolving an age-old mystery that had haunted Europeans for over sixteen hundred years. In the 1860's Baker discovered Murchison Falls and in the early 1880's Thompson climbed Mt. Kenya—at last the world could believe that that mountain really existed and that there was snow at the equator!

By 1900 the heart of Africa was no longer a complete mystery to Europeans. The Americans, too, had had their eyes opened to the
dark continent but it had to be left to Theodore Roosevelt to properly "conquer" it to their satisfaction. In 1909, armed to the hilt and with a troop of baggage porters the size of a small army, T.R. answered the call of the wild that had rung in his ears since the days of his cowboy youth and penetrated the East African wilderness seeking trophies of the "most savage beasts on the face of the earth." Only when the animals had been bagged, shipped to America, and carefully preserved in the Smithsonian Institution could many Americans feel they had done their part in the discovery and conquest of Africa.

The struggle for power in Europe near the end of the nineteenth century produced a scramble to stake claims to African territory. An attempt was made to apportion spheres of interest in the dark continent according to the discoveries and explorations made by the missionaries and explorers of the respective countries. In East Africa the not altogether satisfactory partitioning was frequently arbitrary, often dividing tribes or ignoring ethnic boundaries. The Portuguese
claim to the whole of the interior between Mozambique and Angola was settled finally by the Anglo-Portuguese Treaty of 1890. This agreement fixed boundaries that remain in effect to this day. The area that comprises Kenya, Tanzania, and Uganda was divided between Great Britain and Germany by treaties hammered out in 1886 and 1890. By 1889 the Italians were securely positioned with a protectorate over the Somali coast and held Eritrea despite their defeat at Adua in 1890.

Although these areas were partitioned for their value as colonies, history quickly demonstrated that the motive for control could not be the mere hope of profit alone for the colonial government. Nearly all of the territorial acquisitions proved tremendously expensive—both in terms of manpower and money that had to be appropriated for the development of the lands. A burden had to be borne—that of "civilizing" the primitive world of East Africa.

But colonial government could not last forever and the decade of the 1960's brought a rash of independence to Africa. New govern-
ments began breaking out all over. There was no immunity in East Africa and by 1970 all three countries--Kenya, Tanzania and Uganda--were no longer under the political control of their erst-while colonial masters. Although they exist as completely independent--politically--today, the break with the past has not been complete. Even though there have been strong movements in the direction of "Africanization," much remains to remind even the casual visitor of the heritage of former colonial days.

Once a deep mystery, East Africa has been discovered, explored, conquered, converted, colonized and now "freed" from colonial domination. The plane of interest has now shifted from mystery to curiosity and the area is constantly deluged with tourists who come to see for themselves this land of gigantic animals. Yet, even with this constant attention and perpetual position in the world news limelight, Africa is still not yet completely exposed to light. Much is, and perhaps always will, remain a mystery. For example, we know now about as much of African cultural antiquity (Leakey's outstanding contribution
notwithstanding) as the nineteenth century European knew of African geography. We cannot decipher the written language of the Kushites. We know almost nothing of the great civilizations of Kush or Nubia. Even our knowledge of geography leaves much to be desired. Much of the fauna and flora have yet to be discovered, identified, classified and studied. And who knows what potential wealth lies hidden in the land itself if ways could be devised to properly develop it. Discovering and exploring the Dark Continent is still a big and exciting challenge not unlike that confronting Livingstone, Speke, and Burton—much indeed remains to be discovered.

In broadest terms, East Africa, except for a narrow coastal plain, is highland and characterized by sub-desert steppes. The deserts are not nearly as harsh and dry as the Sahara, to be sure, but they are dry enough. And the mountains, while not the highest in the world, are high enough and easily the highest on the African continent. It has been said that in all the legends of saints
and prophets either a desert or a mountain is pretty sure to play an integral part. As the gospel of modernization sweeps across East Africa and the prophetic voice from the wilderness cries for development, both mountain and desert loom large as obstacles to be tamed.

Central to any development in this part of the world is the consideration of water: how to find where it is not now found, how to get rid of it peacefully where it is found in too great abundance. And without the mountains and the highlands, there might be little hope for water at all in much of East Africa. But much of the water that is available must be contained, stored, channeled, and ultimately transported with greatest care or most of the area will forever remain desert.

It has often been observed that a major difference between man and animals is adaptive ability. Over the years, animals have demonstrated a propensity to adapt themselves to the rigors of their environment. Man, on the other hand, manages to modify his external environment rather than himself to suit his needs. Adaptation in East Africa has not been easy for either man or animal. Most 'Wild' animals, however, have
been relatively successful. Some animals can and do go for days without water when the dry season comes. Other animals, like the lungfish, must go into the ground and pass the dry season away from direct exposure to the harshness of the climate. Most, in one way or another, have adapted to the point that they live on little water during the times when water is in critically short supply. Plants, too, have demonstrated an outstanding adaptive capacity, enlarging trunks, sending down deep roots, replacing leaves with thorns and passing the dry spells in a state of dormancy.

But man and his animals are not so fortunate; they must have water in regular quantities and at regular intervals. While cattle, for example, have been in Africa for four or five thousand years, they continue to suffer from their failure to fully adapt to either climate or terrain. Heat stress takes a great toll and lack of water is a constant problem. The cattle must drink at least once a day to maintain their weight and their health. And although man has been there even longer than his cattle, he is even more dependent upon a good source of water.
East Africa is not to be easily modified even by man, and water is often the area's most valuable commodity—often the hardest to find and often the most difficult to reduce to usable quality.

As is the case in most places in the world, rules have been developed and procedures agreed upon by which this scarcest and most valuable resource can be used and shared. The rules are sometimes primitive and simple. Sometimes they are very complex indeed but they are always necessary—even in the areas where too much rain falls, and where the rules must regulate how to dispose of the excess water before it injures another or his property.

This book examines the rules that have been formulated by the governments of East Africa pertaining to the regulation of water use and consumption. No attempt has been made to investigate or explain the many traditional rules developed by tribes that still may have force in the more remote regions. A caveat or two is perhaps in order at this point. One must not conclude that the orderly development of water resources in the future is guaranteed and no unresolvable alloca-
tion conflicts will thereafter arise just because rules have been established by central government authority. Since water regulation and legislation is a comparatively recent phenomenon in East Africa, examination and re-examination of the laws must go on for years to come before the evolution of regimes that will be fully capable of handling the unique situations of the area. There are still many gaps, too, in the presently existing laws, that must be discovered and eliminated. Further, there is often a "formalistic" difference between how the laws appear on the books and how they are actually implemented. In many areas, water in East Africa presents the observer with outstanding examples of a high degree of discord or at least a marked lack of congruence between the formally prescribed and the effectively practiced. In this context, it is also important to remember that even if such formalism is identified, it does not necessarily follow that a negative shadow should be cast on the system. Some formalism may, in the final analysis, be a positive condition. At any rate, the condition must be recognized in order to understand
the regime and to facilitate identification of those areas that must be changed, formalistic or not.

Finally, one must not be led to conclude that simply because there is some superficial similarity between institutions in East Africa and elsewhere, particularly in the United States, that institutions have been copied, function the same, or are even intended to function the same. There has been a widespread borrowing, to be sure, and it is easy to conclude that the permit system in East Africa, for example, is nothing more than a transplant from the prior appropriation doctrines of western United States. Such may not be the case at all once that particular aspect of water law in East Africa is properly understood.

*Uhuru* means freedom in the Swahili language and *maji* is their term for water. At a recently completed dam in Tanzania, the two were symbolically linked together and prominently displayed on the dedicatory plaque in the phrase "*uhuru na maji*"—freedom and water. Water truly symbolized freedom for much of East Africa in a very real sense. It is hoped that a contribution will be made here to the understanding of
those laws that regulate use and consumption of water in this area of the globe and thereby enhance their role in the struggle for freedom.
CHAPTER II

East Africa: Its Land, Natural Resources, and People

The people of Africa have been called "small figures in an immense scenery." The scenery is indeed immense and has earned a controlling influence over the fortunes and destinies of all who have settled there. In many areas, nature has successfully defied man's attempts to even occupy and civilize parts of the land. Immensity, too, describes the continent. Africa is the world's second largest in area. It is a land of lush tropical rain forests—"glittering equatorial sums where huge trees jostle one another for room to live" and harsh deserts filled with unbelievable emptiness and unequalled topographic extremes, many of which are aptly termed immense. The Sahara is among the world's largest deserts, Kilimanjaro among the highest mountains, and the Congo basin one of the largest rain forests.

The Roman scholars Pliny and Elder said nearly 1900 years ago that "There is always something new from Africa." The emergence of new nations by the handful have forced Africa onto the front pages of
nearly every newspaper in recent years. In 1950 there were only three
independent countries—Egypt, Ethiopia, and Nigeria. Today there are in
excess of fifty. New maps, new studies, and new books appear almost
every day. But the past is still very much a part of today's Africa.
The Great Rift Valley has given up remnants of some of the oldest forms
of human life. The Olduval Gorge in Tanzania, and part of the Rift, is
the location of Dr. L. B. S. Leakey's most famous excavations and the
primordial source of his Zinjanthropus. But other sites scattered
throughout Kenya and Tanzania have also yielded relics of inestimable
historical value, making East Africa a veritable gold mine of antiquity.

Elsewhere, traditions and practices that are older than written
history can document still affect political and social behavior of many
peoples. But older than all of these is the same scenery that is so new
to us of the western world. Man in Africa has had to cope with his
geography since time immemorial—sometimes successfully, sometimes not—
and it is impossible to even attempt an understanding of African insti-
tutions without putting them in their proper geographical perspective.
This is especially true when one seeks to understand how the African people have attempted to regulate the use and consumption of water, something so intimately linked with both geography and social development.

Africa has traditionally been divided into two parts--North Africa or Saharan Africa and Bilad-as-Sudan (the land of the Black People) or Sub-Saharan Africa. As a zoogeographical region, this area south of the Sahara is known as the Ethiopian Region. Although East Africa forms only a small part of the Ethiopian Region, all the major landforms and climate extremes of the entire region are found there in one degree or another.

A few broad generalizations are possible about the geography of East Africa. It is bounded in large part by natural barriers. The Indian Ocean lies to the east. The mountains and lakes of the Rift, including the famed Mountains of the Moon and the lakes that feed the Nile River, mark the west. To the north are the stony deserts that separate Kenya from the Highlands of Ethiopia. To the south, great lakes, among them some of the longest and deepest in the world, separate
Tanzania from Malawi and the southern Congo. While the Ruvuma River, that divides Tanzania from Mozambique, is a natural boundary, vast areas on both sides of the river are geographically similar but it is only between Zambia and Tanzania that the boundary of East Africa is clearer on the map than on the ground.

Taken as a whole, East Africa is considered as one of the great volcanic areas of the world. Most of the mountain peaks, including Mt. Kenya, Elgon and Kilimanjaro, are the cones or craters of extinct volcanoes. Many of the volcanoes are still partially or violently active. Kilimanjaro still gently puffs steam but the Virunga peaks on the Ruanda, Uganda and Congo borders are more violent. Mount Elgon on the Kenya-Uganda boundary is an enormous crater, one of the largest in the world and second only to Mgorongoro in Tanzania, world famous for its grassland floor that teems with big game.

Elgon has no permanent snow but both Mt. Kenya and Mt. Kilimanjaro have permanent glaciers and snowfields together with the Ruenzori Range. They are the only African mountains to bear permanent ice.
Although they are not volcanic, the Ruenzori, the fabled Mountains of the Moon, are unique in other ways. In the Ruenzori, the rainfall is the highest recorded in this part of Africa. There, run-off has gouged deep gorges over the centuries as it made its way to Lake Albert and the Nile. The peaks are nearly always enshrouded with clouds, and the high humidity combined with an exceptional absence of a dry season produce such lush plant growth that the range's upper slopes are blanketed with cloud forests.

The Great Rift is perhaps the most impressive topographical feature in East Africa. It is certainly the largest and most prominent. Running from the Zambizi Delta in the south to the Red Sea in the north, it is a spectacular gash in the earth's crust some 5,000 kilometers in length. The appearance makes one wonder if the earth has simply dropped a few hundred or thousand feet in an otherwise flat bush country, leaving mile after mile of exposed vertical cliff. In prehistoric times, the floor of the Great Rift appears to have been filled with swamps and great lakes. Today all that remains are
massive plains of white dust or alkaline lakes. The smaller soda lakes support a fantastically large flamingo population while the larger lakes, notably Lake Rudolf and Lake Baringo, support a very varied fish fauna, since they are less alkaline. Among the lakes of the Great Rift, Lake Naivasha is most unusual as it is a fresh water rather than an alkaline lake.

The lakes of Tanganyika and Nyasa to the south and Albert, Edward, and Kivu to the north make the deep trench of the Western Rift. Lakes Tanganyika and Nyasa are tremendously deep; their bottoms are below sea level. Lake Tanganyika has been sounded to a depth of 600 meters.7

Lake Victoria, the largest lake on the continent, lies equi-
distant between the two arms of the Rift Valley. Here the Nile officially begins its 4,000-mile journey to the sea, tumbling over Ripon Falls and on to Lake Kyoga. Lake Victoria, like Lake Naivasha and others in the area, is dominated by a single plant species, the papyrus. Floating islands dot the lake and massive papyrus swamps
stretch along the Nile, totally controlling the immediate landscape.

Forests in East Africa are as surprising as much of the rest of the area. Even though rainfall distribution varies considerably, factors such as similarity of altitude, low temperature, and high solar radiation combine to produce belts of similar vegetation. Generally, mountain forests cover the lower slopes up to about 9,000 feet. These are similar to true tropical forests but are characterized by smaller trees, fewer climbing vines and several non-flowering evergreen trees. Often stands of mature trees will tower over a wide variety of shorter trees. In other places, wild bananas will be found in practically impenetrable thickets. It is thought that at one time most of East Africa was covered by such forests but today only about two percent of Kenya and Tanzania remain in extensive forested condition.

This reduction in forest land area has had a significant impact on both animal and human populations. Many animals once found in abundance have disappeared from most of East Africa altogether or are
endangered and found only in the remotest regions where the forests are as yet relatively undisturbed. Further, peoples like the Kikuyu that have traditionally lived by shifting cultivation, that is, by clearing areas of forest, planting and then moving on to repeat the sequence once the land becomes unproductive, have destroyed considerable forest and are running out of new undisturbed areas into which they can move their increasing populations.

Riverine forests are in many respects similar yet retain their own peculiar elements. Typically found as narrow belts along banks of rivers, such forests are dense with creeper-hung evergreens and an occasional wild fig. A great variety of vegetation is found here and often animals that are normally considered montane-forest dwellers.

Above the montane forests, on the mountain slope, a very narrow belt of bamboo exists together with forest trees that normally grow at lower elevations. As a habitat, this belt is surprisingly barren because the dense bamboo manages to crowd out most other plant and animal life. Above the bamboo, forests of heather and giant grounse...
behind. This compounds the destruction.

It has been observed that "the plains, by virtue of their openness, offer a unique opportunity to see at a glance the basic relationship of what is a complex ecological system. The herbivores that keep their numbers in check lurk in sheltered places. Overhead, vultures wheel, while perhaps a solitary jackal trots purposefully along a well-worn trail. The overriding impression is one of harmony, with each animal perfectly adapted to fit a particular way of life." Although "small figures in an immense scenery," man and his animals often upset that otherwise perfect balance.

While man has played and will forever play a vital role in the ecology of East Africa, the environment, too, has played a vital role in his life. It is perhaps an excessively broad generalization to say that East Africa has only two seasons—the wet season and the dry one—but it is true that one needs to understand both to fully appreciate the water situation of the area. Although East Africa as a whole is essentially a hot and relatively dry place, the dry season is of particular
importance to both man and his animals. Temperatures rise and often
the sky is altogether cloudless with no hope of relief for the parched
land. When the humidity is low, as is generally the case during these
periods, more solar heat gets to the ground in the daytime and more is
lost from it during the night. Thus, with no clouds and the sun vir-
tually overhead, intensively hot days contrast sharply with correspond-
ingly colder nights. Dust, in addition to the general lack of water,
is a serious problem. As the ground heats up in the morning, columns
of hot air rise. These generate enough wind to whip the dust into
spectacular dust-devils which rise hundreds of feet into the air and
travel several miles. Heavy materials that have been picked up will
be quickly deposited again, but the finer dust will often be carried
considerable distances before it is returned to earth. At the height
of the dry season, the landscape often appears to be covered by a fine
coat of dust everywhere.

During the dry season, many small animals that are particularly
susceptible to desiccation hide during the heat of the day in the rela-
tive coolness and humidity of the ground beneath rocks and logs and thereby conserve precious moisture. Some animals appear to live without water altogether during this period as they pass it in a state of aestivation. The Lungfish and the African catfish are good examples of this type of animal. Tortoises and terrapins also aestivate, as do some frogs and many invertebrates. The fat mouse probably does also.

The Giant Snails cement their shells shut with mucus which dries into a hard cap thus reducing evaporation.

The majority of the larger game animals spend the day in the shade, either under bushes or trees or, like the Bohor reedbuck, in peculiarly formed shelters made from tall grass. There they avoid as best they can the dangers of overheating and dehydration. The daytime for them is generally a period of relative inactivity and when the evening brings coolness they stir and make their way to water. There they drink their fill (which for an elephant is between 140 and 170 liters) and wallow in the mud which effectively dissipates heat. When feeding ground and water holes are not in the same vicinity, animals must travel
over great distances. Elephants have been reported on occasion to travel 15 miles from feeding grounds to water. 13

Of man's animals, those that suffer most in the dry season are the cattle. Although they have reportedly dwelt in Africa for four or five thousand years, they have failed to adapt fully. They suffer considerably from heat stress and require a drink at least once a day. 14

Fire is naturally associated with the dry season. Since time immemorial, it has been the traditional practice of many tribes to burn the plains during one or both of the dry seasons to keep down trees and brush that are not useful to their cattle and which otherwise threaten to take over the range. The fire also allows nutritious grasses to maintain themselves and forces them to send up green shoots at a time when other fodder is scarce.

Fire at the wrong time and in the wrong place does cause considerable damage to the land. It destroys habitat for animals and it destroys the animals themselves if they are not fortunate enough to escape. Often, too, with the fire-caused loss of ground cover, some
areas are particularly susceptible to serious erosion problems when the rains come. Because of these and other problems, most East African conservationists are opposed to burning. They argue that it is the principal agent in the degradation of habitats. But because soil and vegetation are so different from one place to another in some areas such as the Kidepo Valley in Uganda, burning may actually be beneficial. There, however, it is carried out in a controlled way by biologists rather than by the tribesmen.

Another ecological event associated with the dry season that is even older than the burning is the migration. The most spectacular of these seasonal movements involve the zebras and the wildebeests. Near the end of May or early June, half a million animals set out on their one hundred-plus mile journey from their short-grass plains of the Serengeti to their dry season feeding grounds. There they are able to find permanent water and plenty of shade trees.

Sometimes, however, the dry season is unusually dry. Such cyclical climatic periods appear to recur at intervals of from 10 to 15
years, and may last a couple of years. These droughts are often usually destructive of plant and animal life and often have a lasting impact on the landscape. A good example of recent drought-induced destruction is seen in the elephant and rhinoceros populations that were greatly reduced in Kenya in 1970-71.

Of all the large game animals found in this part of Africa, none seems more adaptable in its eating habits than the elephant. Feeding on any of a hundred different food plants, from head-high course grass to underground bulbs, elephants are able to feast on foods rejected by other grazers. But because much of what they eat is woody or fibrous and their digestive tract relatively inefficient, tremendous quantities must be consumed before the beasts are satisfied. Often the effect on the ecology is beneficial. In the more dry areas, almost all the animals are dependent on the elephants one way or another, often even for their food. For example, in swampland the trampling of high coarse grasses by elephants in their search for food often reduces the tangle of otherwise inedible grass to a freshly sprouting carpet of tender
green that can be consumed by the other animals that follow the elephants. Tree limbs, too, are broken often, making foliage available at lower levels for shorter browsing animals. Further, by eating the fruits of certain palms, new groves may be seeded miles away as the hard unbreakable seeds are not digested but excreted as the herd moves on. The elephant's waste excretions are equally valuable to the environment. Six pounds of dung will attract 16,000 insects in one night. In addition, most of it is eventually carried underground by dung beetles where it can fertilize plant growth. Elephants also can exert a profound effect upon water supplies. By puddling with their feet they create depressions that trap the water of the rainy season. They create waterholes by rolling and bathing in these puddles and by plastering themselves with the mud. They can dig wells in sand with their trunks and by trampling through riverbeds they often can raise the water table enough to cause ground water to flow at the surface.

In other places, however, the elephant's eating habits are very destructive. In wooded areas, trees may be uprooted or killed by debark-
ing and trampling, brushland can be converted to grassland with its
attendant dangers of fire, and sometimes even the grasslands can be
reduced to barren wastes before they have a chance to reseed. It is
argued that the elephant, aided by fire, is the prime natural converter
of forest to brush and brush to grassland. At least in terms of
their impact on the environment, they must be considered second only
to man in their ability to alter it.

In drought years the effect is most strongly felt; heavy brows-
ing kills more trees and much more grass is trampled and destroyed as
the elephants are forced to move farther to find the food they need.
In recent drought years elephants have turned to eating things they
had not normally been known to relish. In the late 1950's they started
attacking the huge boababs and today few large trees remain that are
unscarred. Many are now being spectacularly destroyed, as they are
ripped apart for the moisture and calcium. This destruction, which is
taking place at an unprecedented rate, is frequently followed by fire
which kills any seedlings and completes the eradication process.
In addition to the damage caused by the elephants, the drought takes a serious toll of the animals themselves. During dry times, the elephant's digestive tract seems unable to assimilate the dry grass and the elephant turns to more woody material such as that obtained from boabab trees which do contain some moisture and nutrition. This type of material is utilized only with great difficulty and frequently death is the ultimate result to the animal. The serious drought that devastated Kenya during 1970-71 is reported to have killed up to 5,500 elephants in one national park alone. If this estimate is accurate, one in three elephants was killed, by the disastrous drought which hit Tsavo East National Park. Other estimates placed the figure at between 3,000 and 4,000 but these are generally thought to be somewhat conservative. No matter what the exact figure, substantial numbers of elephants were destroyed and the destruction was indeed drought induced.

The use of the term "drought" may be a little misleading as many might suppose that death was caused by a lack of water. Such seems not
to be the case at all. Post-mortem examinations of freshly dead elephants revealed that they had full stomachs but that the contents were mainly with no green materials. There was also further evidence that the animals suffered serious protein deficiency which, together with the stomach contents, suggests that death resulted from malnutrition directly caused by the forced changes in eating habits induced by the drought conditions.

A similar die-off was reported among rhinoceroses but the total number of animals destroyed was much lower—estimated at only 300. Significantly, chemical examinations of the blood serum of dying animals and examinations of stomach contents pointed toward the same conclusions deduced for the elephants. The rhinoceroses, too, died of malnutrition, caused by drought.

There is some evidence that such die-offs are as periodic as the most severe of the cyclic droughts which come at roughly century intervals instead of occurring over a 10 to 15-year cycle. There is also considerable evidence that nature has taken her own course either to
reduce excessive populations to optimum levels,\textsuperscript{30} or to move the area itself into its vegetal climax stage of grass.\textsuperscript{31}

There has been considerable controversy over the proper cause of and solutions to the die-off. Some argue that the elephants should be cropped to keep their numbers in line with what the environment can support.\textsuperscript{32} Others argue that the destructive effect of too many elephants, coupled with the natural culling effect of periodic drought, actually has a beneficial impact on the environment.\textsuperscript{33} No matter what the eventual resolution of the problem might be, the important economic value of the elephant, to the native, the tourist, the national economy, and the environment sharply illustrates the degree to which climate and particularly the dry season makes its impact felt. This factor must be considered before any large scale, long-range economic planning and development of water resources can be formulated.

- - - - -

Toward the end of the long dry season, clouds tend to build up daily, reflecting the gradually increasing humidity. This effect on
the vegetation is spectacular as many flowers and plants blossom even before the rains fall. Rain, when it does come, is not the gentle drizzle one might expect but usually a precipitous downpour coming late in the afternoon or after dark. Animals on the plains can often be seen traveling to a distant storm—sometimes as far as twenty miles during the night.

After the rainy season is well established and there is an abundance of good grazing, animals will spread out from their permanent water-hole areas. The wildebeests make their return migration following well-marked traditional tracks. This is usually the time new animals are born and a herd of animals can scarcely be found that does not have its share of young.

As the rainy season continues, rainstorms become more frequent, and more violent. Occasionally, these heavy rains fall as hail—even on the equator—if they strike at higher altitudes. When the storm is over, many areas will be left under water and thus, for a brief time, the problem is one of too much water rather than too little. In some
areas, very little rain has a chance to sink into the soil; most of it is carried off in rills and gullies into larger temporary watercourses. These discharge into rivers which may become raging torrents destroying anything in their path. Usually only dead animals, trees and silt are carried away by the floods. Sometimes, however, a village gets in the way and the destruction is more extensive. For example, when exceptionally heavy rains fell in the Nandi Hills area of Kenya on June 4, 1972, hundreds of families were left homeless as between 600 and 700 houses were either swept away or inundated.

At the end of the rainy season, the showers become less frequent and less violent and are separated by longer rainless periods. In the highland areas, the land will be beginning to produce its late summer harvest. In the arid country, the grass will already be turning dry, bushes and shrubs will be dropping their leaves to assume the winter appearance of the dry season, and the small animals will be looking for refuge underground. Rivers will be low, and many waterholes drying up, and most of the country will be beginning its next period of drought as
East Africa moves again into the dry season.

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Tribal man lived in very close contact with the seasonal patterns of nature and physical imperatives of geography. Most tribal rites and activities display this association. The kinship system of the Kikuyus is directly related to and demonstrates this dependence upon geographical setting. The Kikuyus are farmers whose home, the grasslands in the highland country of Kenya, is a series of hills and ridges, divided by gullies and valleys. Each ridge is the environmental bailiwick of a family. In the Masai tribe of cattle herders, naming cannot take place without involvement with their environment: A bullock (which must be jet-black) is chosen from the family herd, killed, cooked and placed before the mother who gives the meat to the other women of the tribe in exchange for their offering of milk. In the evening when she goes to milk her animals, the child is taken with her on her back to the corral and named among the cattle.36

Winds of change are blowing across East Africa and the tribe has
not been spared the confrontation with modernization. Even so, many persons in East Africa still live in tribal situations and are still governed by the same rules of tradition that regulated the lives of their ancestors. And while these tribesmen manage to have a minimal contact with their 'modern' governments, their existence is still very much controlled by the "scenery" that is so immense around them. The formal rites that link man and nature may have been, on occasion, abandoned but the tie is still very much there. Cities and villages that have replaced many nomadic tribes or tribal settlements, need increasing quantities of water and other natural resources. Increasing herds of cattle, goats and sheep need more pasture and better water supplies. Farmers looking for land in arid regions need water to make the desert blossom. Cities produce incredible amounts of waste that must be disposed of--in ways that do not involve polluting the sources of water that are so important for peoples downstream.

While tribal man was often controlled by the nature of his environment, the dominating factor in the ecology today now is clearly man
himself. In East Africa, he has in many areas altered his environment to meet his needs. Dams have been built, wells dug, floods controlled and pipelines laid that allow him to possess and dominate more of his environment. In other areas, he has altered his environment to his own detriment and is now painfully aware that progress through technology has been able to modify but not eliminate his continuing interrelationship with nature. Today, many areas that once supported lush grasslands and abundant animals, are now reduced to stony patches of red soil barely covered with sparse thornbushes—largely as the result of extensive overgrazing. Most of the forestland that has been cleared has resulted in a loss of animal life and habitat. Many streams that are vital water supplies for villages are excessively contaminated with human and industrial waste. And even the animals that have so successfully attracted the tourists (that in large part support the economies of East Africa) are finding their very existence threatened by human invasion of their territory and by the high tolls taken by poachers seeking their skins. The area is no longer an untouched wilderness teem-
ing with an incredible abundance of wildlife and, unfortunately, the
effect of man cannot be avoided. Fortunately, enough of the wilder-
ness survives to teach man of his interlocking relationship with it.
Man has been in East Africa a long time. He is, in every sense of
the word, a true native of the area. Yet unless he learns to live
within the confines of this "immense scenery" he may destroy his own
means of eventual survival.

KENYA

The Republic of Kenya gained its independence from the British in
1963 and has since then been hailed a model of stability for other
nations of black Africa. As a country of almost 225,000 square miles,
Kenya ranks as only a medium-sized African state. In the west, it
shares an equatorial location with the forest states of the Congo and
the less humid states of Uganda and Tanzania. Snow-covered Mt. Kenya
is quite near the geographical center of the country and marks the
equatorial center as well. The equatorial location is somewhat de-
cieving, however, as little tropical fauna and flora is found.
Kenya is a country of great climatic and geographic diversity. Along the border with Uganda and stretching from Lake Victoria to the central part of the nation can be found rich agriculture highlands. These contrast sharply with the arid plains country of the north and northeast which comprise well over half of the country's total land use.

The great physical contrast and the scenic beauty that so attracts visitors from abroad is the result of an equally diverse geological past coupled with a wide range of climatic conditions. The rock formations range from the oldest members of the African Shield to recent volcanic and sedimentary materials. Climate is modified by altitude but is primarily differentiated by rainfall regimes. Both bimodal (that is, with two "rainy seasons") and unimodal (with a single "rainy season") regimes are present; the coastal region, lake shore and western rift are predominately unimodal, and northeast and central Kenya bimodal.

Altitude more than the equator influences the climate as far as
temperature characteristics are concerned. The agricultural highlands are located between 4,000 and 7,000 feet where a pleasant temperate climate is found the year around. The low-lying coastal zone is hot and humid while the low north and northeast plains are hot and very dry.

If it were possible to say that there is a typical Kenyan landscape, it would be described as bush and grass country with scattered or clumped trees and thickets. This, of course, does not describe the mountains and coastal areas that are protected forest, nor the areas of intensive agriculture in those areas where sufficient rainfall permits. Both the forests and the intensive agriculture require considerable rainfall—something that is not easily found in Kenya. While it is variously estimated that 50-75 percent of the total land area is semi-arid with less than 30-35 inches of rainfall, rainfall patterns vary greatly both in terms of annual precipitation and seasonal distribution (see figure 1). Between Lake Victoria and the western escarpment of the Great Rift Valley, the mean annual rainfall is 49 inches and may occur at any time of the year. Within this zone, the higher areas
may receive over 80 inches.\textsuperscript{40} In the central highlands, similar quantities may fall but often occur in two definite seasons, from March to May and from October to December.\textsuperscript{41} On the coast, rainfall will vary from 20 to 60 inches—usually between April and July.\textsuperscript{42}

For convenience the country is sometimes divided into four broad physical geographic regions: (1) the Coastal Plain, (2) the Arid Low Highlands, (3) the Kenya Highlands, and (4) the Lake Victoria Borderlands.

The Coastal Plain (see figure 2) is in many respects similar to the typical African coastal regions. It is narrow (never reaching more than 40 miles wide), and contains a few good harbors, and is fringed with lagoons, mangroves and coral reefs. Mombaso, on the southern coast receives the highest rainfall but precipitation declines as one moves both northward and southward from that point due to the deflection of rain bringing northeast and southwest monsoons.

Immediately inland from the coast are found a series of low, dry plateaus. These stretch all the way from the Tanzania border to the south to the northern border with Somalia and Ethiopia. This plateau
area is the largest of the four regions and covers most of the land in Kenya receiving less than 20 inches of rainfall annually. Much of this area receives considerably less rain and often does not get even ten inches a year. Although generally a dry region, there are occasionally enclaves where precipitation is greater—due largely to an elevation of over 5,000 feet. Here one finds a vegetation pattern much denser than the scrub brush normally encountered in the lower areas.

The Kenya Highlands are generally higher in elevation than the plateaus just described and are primarily volcanic in nature. Rainfall here is considerably greater and often the heaviest in East Africa, most of it falling along the escarpment and floor of the Eastern Rift Valley. This is the most densely populated region and the one of most intensive agriculture.

The Lake Victoria Borderland, the final region, has a reliable and evenly distributed rainfall exceeding 30 inches almost everywhere. The area is nonvolcanic and is a heavily eroded plateau region.

Taken as a whole, the country-wide mean annual precipitation is
20 inches. This means a predominately dry country in which three-quarters or more of the land area does not regularly receive enough rainfall to support nonirrigated agriculture.

There are four principal factors that regulate the dissipation of all precipitation: run-off, evaporation, plant transpiration, and percolation to groundwater.

It is estimated that the total quantity of water falling on land in an average year in Kenya is 235 million acre feet. However, not enough is presently known about evaporation and transpiration losses to confidently estimate what part of that total is actually available for beneficial uses.

Reliable studies show that, in four years out of five, only 15 percent of the country has a rainfall equal to or in excess of 30 inches (760 mm) per annum. The 30-inch isohyet is significant as it generally marks the boundary between lands of high potential and arid and semi-arid lands. Only three percent of the country receives over 50 inches.
The drainage system is determined by the Great Rift Valley. Waters in the valley are handled by its own internal drainage system. Waters flowing westward to Lake Victoria and eastward to the Indian Ocean are handled in four major drainage basins (see figure 3). These drainage systems are called the Lake Victoria, draining 19,000 square miles, the Athi River, draining 27,000 square miles, the Tana River, 51,000 square miles, and the Ewaso Ng'iro with 79,000 miles. The Rift Valley drains 49,000 square miles. The mean run-off in these principal areas varies from 1.2 percent in the Rift Valley. Run-off for the rest of the country outside the Lake Victoria basin averages only 3.25 percent. The Ng'iro basin, which with the Rift Valley comprises 57 percent of the land surface in Kenya, has only 1.4 percent.

With such relatively low rates of run-off, one should expect a considerable part of the precipitation to reach the groundwater table, particularly in the areas of high rainfall such as the Lake Victoria basin and the Central Highlands.

Evaporation from the open water surface of lakes and rivers is high,
estimated at over 50 inches per year at altitudes over 10,000 feet and
over 100 inches in areas below 1,000 feet. Nevertheless, it is thought
that in areas of extremely low rainfall, such as the northern and eastern
parts of the country, where evaporation loss from open water may exceed
100 inches, the pattern of rainfall which results in flash floods fol-
lowed by relatively rapid drying would indicate that at least in the
flood plain areas good quantities of ground water should be found.

Groundwater is by far the most important water resource in Kenya.
With the exception of Nairobi where conservation measures have been
implemented, groundwater resources are extensive and largely undeveloped.
Although the mean water table is about 260 feet, which is considerably
deeper than that generally found in other parts of Africa, development
has been undertaken since 1927 through extensive use of boreholes.

Because of the pattern of population concentration in areas of
relatively high precipitation, there has not been much of a water short-
age problem. One study concluded that 'on a country-wide basis, there
is an ample supply of water, but it is unequally distributed, stream
flows are subject to wide seasonal variations and the occurrence and
safe yields of groundwater reserves have been only sketchily charted.

In explaining and justifying the above conclusion, the same study
suggests that all might not be so well in the future.

In the well watered highlands and coastal strip there
are few problems with respect to the basic availability
of adequate and good quality water supplies. As commun-
ity demand develops in these areas due to population
growth, increased domestic consumption and industriali-
ization, surface run-off will have to be conserved to an
increasing degree by impoundments, greater use will have
to be treated to facilitate downstream reuse. Although
costs may increase as more remote and undesirable sources
have to be utilized, the water is generally available
for development.

Communities located in relatively dry zones, but within
economical distances of perennial streams, may be equally
fortunate to those in the well watered zones with regard
to the availability of developable supplies. In such
areas, however, there is likely to be considerable compe-
tition with agricultural interests, since the viability
of agriculture will depend on irrigation and the avail-
ability of water for all purposes may be limited to a
single source.
UGANDA

Young Winston Churchill once remarked that "Uganda is a fairy tale. You climb up a railway instead of a beanstalk and there is the wonderful new world." Perhaps the most striking aspect of this new world—especially if one has traveled from Kenya—is the greenness that greets the stranger who approaches the country over Lake Victoria's north shore. In contrast to much of Kenya, Uganda is quite a lush paradise.

Uganda achieved her independence from Great Britain in 1962 and began life as a nation as a loose federation of old kingdoms—Buganda, Ankole, Toro, and Bunyoro. By 1967, a central government had abolished the kingdoms and Uganda was declared a republic. Uganda has at least her share of political, economic and social problems and there is still an uphill battle to be won before uhuru—freedom—finally comes to all Ugandians in all walks of life.

Physically, Uganda is about the size of Ghana and is comparable in area to Great Britain and Northern Ireland. The entire drainage
system of the country forms the upper catchment basin for the White Nile which begins its journey to the sea there, with the outflow of Lake Victoria supporting the main discharge of the river. There are 16,400 square miles of open water and swamp---20 percent of the country's area---and most of the innumerable rivers are sluggish, vegetation-covered and swampy.

It has been observed that the three important features of the occurrence of natural waters in Uganda are (1) the existence of large historical lakes, (2) the presence of large areas of swamp, predominately of papyrus, and (3) the presence of permanent ice. The ice is found in the form of glaciers on the uppermost slopes of the Ruenzori Mountains that mark the boundary between the Congo and Uganda. The southernmost of these glaciers is practically on the equator. As mentioned previously, such ice is rather unique in Africa and is found only in East Africa.

There are five large historic and well known lakes within and about the nation's boundaries. Both the drainage system and these
lakes are relics of the earth's movements associated with the Rift Valley faulting of the Quaternary Era. It is thought that previous to this time, Uganda drained westward into the present Congo system. It is thought that previous to this time, Uganda drained westward into the present Congo system.  

Most of Uganda forms part of the high African plateau and is just under 4,000 feet above sea level. The southern part of the country is occupied by Lake Victoria, the second largest body of fresh water in the world, while to the west the mountain peaks soar to over 16,000 feet. This altitude and geographical configuration created a generally pleasant though slightly damp climate in spite of an equatorial location. Uganda is dominated by a well-marked seasonal rainfall regime where, except in the extreme northeast, annual precipitation exceeds 30 inches. The heaviest rains fall at two distinct periods in the year, the first in April and May and then again in September and October.  

Between the rains, the country experiences conditions that sometimes approach drought levels. June through August are generally the dry months in the north while November until March are dry in the south. This wet and dry seasonal sequence is not nearly as serious, however, as the
uneven distribution of the rains when they do come. Although there is sufficient moisture for plant growth, the unevenness of distribution often seriously hurts growing crops. It is estimated that one third of the country is in a water-scarcity zone. This total, of course, includes the dry northeast but it also includes large sections of southern, central and western Uganda where there are water deficiencies caused by inadequate seasonal and geographical distribution patterns.

As a result of this, the most pressing problem of water supply is the requirement of the rural population in the "water-scarcity" zones. Here, partial failure of the rains results in crop failures that produce migrations of men and cattle to areas of sufficient water which in turn leads to friction between communities, malnutrition and hunger and the spread of disease among the cattle.

Other serious water problems that face Uganda today are caused by poor drainage, substantial populations in more remote upland areas, overgrazing and excessive erosion. Various approaches have been taken to alleviate this situation but in most cases the lack of adequate
hydrometerological data necessary for proper planning and design has been a serious impediment. Over the years, however, much has been accomplished and there is firm basis for hope in the future. By 1968 over 5,000 boreholes had been drilled by the Geological Department in an attempt to develop the groundwater supplies in drier parts of the country. Also, by that date, over 1,000 storage dams and valley tanks had been constructed in areas with low groundwater supplies or low groundwater potential. Attempts at reclaiming acid peat papyrus swamps have demonstrated that careful control of groundwater levels and continued cultivation will convert these swamps into productive land that can be irrigated by drainage water.

Compared with the problems of water supply in rural areas, the government apparently feels that most other water supply questions are secondary. The major urban areas presently have adequate water supplies but these will undoubtedly have to be expanded in the future. For this reason, the Second Five Year Development Plan, 1971/2-1975/6 is heavily weighted in favor of research and meeting the needs of rural
TANZANIA

Of the three nations forming East Africa, Tanzania is the youngest.
The United Republic of Tanzania, consisting of the republic of Tanganyika
and Zanzibar, was formed in April, 1964. Although there are many areas
of interdependence between the mainland and the island of Zanzibar,
water law appears to be handled completely separately. Thus it is appro-
priate for the purposes of this book that we discuss the two as if they
were separate nations altogether. Tanzania (referring to the mainland)
lies immediately south of the equator between the great lakes of Victoria,
Nyasa and Tanganyika and the Indian Ocean. Except for a narrow strip
along the country's 550-mile coast, the country lies spread out between
1,000 feet above sea level and 19,000 feet above sea level with most of
the country at a plateau of about 4,000 feet.

As in Kenya and Uganda, the chief factor in shaping and limiting
the agricultural and livestock potential of the country is the rainfall
pattern. On the whole, Tanzania is a dry country. Rainfall everywhere
is seasonal, in some places coming in two rainy seasons - in others, falling only once. The general pattern, however, in most of the country is to have just the one fairly short period of rain making conditions for agriculture and livestock difficult.

Between one-half and three-quarters of the land is open woodland or bushland and thicket, interspersed with man-made savannas and grasslands. Even in these otherwise physically hospitable areas, soils tend to be poor, characterized as too saline or too alkaline or too variable in texture for extensive utilization. Further, the vegetation patterns are very favorable for tsetse fly infestations and much of the country's interior will remain useless unless measures of eradication are taken, notwithstanding the fact that in some of these useful areas rainfall and good soil have combined in unusual and certainly somewhat unique high potential areas.

In many areas, flooding will alternate with the seasons. Just as in Kenya, rains come so violently and water reaches the groundwater table so slowly that flash flooding is an expected incident in the
rainy season. Paradoxically, there are relatively few areas where flood control by itself offers the solution to land development. Often irrigation is the other necessary ingredient, but rainfall is often so meager and flooding so frequently the flash-flood type that little water can be meaningfully stored for irrigation without great cost and little of the actual flooding itself can be accurately anticipated.

For purposes of water development, the country can be conveniently divided into several hydrological basins that conform to the country's natural drainage patterns. The Indian Ocean Drainage Basin is drained by rivers and streams that flow directly into the Indian Ocean. The major rivers of this basin are the Pangani, Wami, Ruvu, Rufiji, Lukuledi and the Ruvuma.

The Atlantic Ocean Drainage Basin is drained into Lake Tanganyika which in turn feeds the Congo River and eventually reaches the Atlantic. The basin contains only one major river, the Malagarasi.

The Mediterranean Sea Drainage Basin drains into Lake Victoria which, through the Nile, eventually reaches the Mediterranean. Major
rivers in this basin include the Kagera, Mara and Simiyu.

In addition to these major drainage patterns which drain outward from the country to the various oceans, there are two internal drainage basins, one feeding Lake Eyasi and the other Lake Rukwa. The major rivers are respectively the Manoga and the Wembere draining into Lake Rukwa.

The major rivers draining into the Indian Ocean are characterized by their perennial nature. This is to be sharply contrasted with the streams in the other basins that may be dry during certain seasons even though they are considered major streams. In such areas rainfall is not enough to support extensive agriculture or livestock without irrigation. Often the water stored in dams would have to be pumped to the fields to be effectively used. This, at present, would seem beyond reach given the current power situation in the country.

Many of the rivers in these drainage basins offer much in the way of possible irrigation and hydroelectrical development. Irrigation is relatively new to Tanzania and its potential is far from fully exploited.
The biggest problem so far associated with the limited hydroelectrical development that has taken place is that most of the power is confined to urban areas. That fact is certainly significant in a country in which over 90 percent of the people live in rural areas.

But lack of power is not the only problem facing the rural population. There are at present many places in Tanzania where the nearest water point is as far away as ten miles from the inhabited area.

Groundwater resources in the country have been largely undeveloped and an adequate survey of their availability is unavailable. Nevertheless, certain generalizations are possible based on recent geophysical surveys. The granitic and other rock formations that are so frequently found with only a shallow weathered surface are far from ideal for the retention of groundwater. Thus, it is not surprising that there are not many major aquifers where groundwater is readily available in substantial quantities. In volcanic areas, groundwater would appear to be more accessible but prospecting is difficult due to the type of geologic formations and water quality there is often lower than desired. Even
springs in volcanic areas are small and yield little water fit for human or animal consumption.

Some emphasis has been placed on boreholes as a means of supplying water. A frequent problem is the depth to which one must drill in order to reach potable water. Wells frequently must go to 500 feet and often the average depth in a given area is between 200 and 250 feet. This generally means prohibitive high cost. Prior to 1960 over twenty percent of the wells drilled had to be abandoned due to too low yield, too high salinity and/or flourine content.

For Tanzania, as for Kenya and Uganda, effective development of water resources is a necessary prerequisite to future development. Although she has considerable areas of water scarcity, other areas have more water than they can presently use. Thus, like Kenya and Uganda, Tanzania must be as concerned with water development as with water distribution and redistribution.
CHAPTER III
The Background Matrix of Water Resources

It is certainly necessary to understand the physical environment of East Africa in order to understand the water situation and the laws that have been developed to regulate it. However, to put these laws in proper perspective, other considerations as well ought to be at least briefly treated. These will help define the social problems that make water such a crucial factor in the future development as they focus on the variables that determine the attitudes and the institutions that are often the parameters of the development equation. We must keep in mind, of course, that there—as so often is the case when one is dealing with the human situation—the whole is much more complex than the sum of the individual parts. There is considerable interaction between the factors to be discussed below which makes it difficult to isolate them and discuss them individually. Nevertheless, some individual identification is necessary. No attempt has been made to identify all relevant factors nor even all of the factors that may be of some major im-
portance. And further, no attempt has been made to place any of the variables in any order of importance.

Race

Numerically, the population of East Africa is overwhelmingly African and is composed largely of peoples from the Bantu and Nilotic or Hamitic racial groups. Despite the numerical preponderance of the Africans, the non-African population has exerted such an important influence on the economic life of the region that it is more proper to speak of East Africa as multi-racial rather than African.

The population has been broken down as follows by race and country:

TABLE 1

Population of East Africa by Country and Race 1963

<table>
<thead>
<tr>
<th>Race</th>
<th>Kenya</th>
<th>Tanganyika</th>
<th>Uganda</th>
<th>Zanzibar</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>African</td>
<td>8,575</td>
<td>9,656</td>
<td>7,093</td>
<td>298.7</td>
<td>25,623</td>
</tr>
<tr>
<td>European</td>
<td>53</td>
<td>21</td>
<td>10</td>
<td>0.7</td>
<td>85</td>
</tr>
<tr>
<td>Indo-Pakistani</td>
<td>180</td>
<td>90</td>
<td>82</td>
<td>19.7</td>
<td>372</td>
</tr>
<tr>
<td>Arab</td>
<td>35</td>
<td>25</td>
<td>2</td>
<td>-- b</td>
<td>62</td>
</tr>
<tr>
<td>Others</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>0.4</td>
<td>12</td>
</tr>
<tr>
<td>Total All Races</td>
<td>8,847</td>
<td>9,797</td>
<td>7,190</td>
<td>319.5</td>
<td>26,154</td>
</tr>
</tbody>
</table>

a. All figures in thousands (000)
b. For Zanzibar, Africans are included with Arabs and Comorians under the heading "Indigenous Inhabitants."

European influence is of comparatively recent origin, beginning
as we have mentioned with the missionary and exploratory activities of
the late nineteenth century. At present, it overshadows that of the
other immigrant races in all but the commercial sector of the economy. 4
Although the British eventually became the dominant power, European
settlement had been in progress for nearly four centuries before the
British arrived. The Portuguese and the French, both of whom predated
the English, were content to confine their activities to a narrow coastal
strip and traded for inland goods with the natives without themselves
seriously penetrating the interior. The British, on the other hand,
did penetrate considerably. They came initially from the north 5 and were
primarily motivated by military and missionary considerations rather than
economic interests. However, conversion and colonization were compatible
bed partners and after the struggle associated with the "scramble for
Africa" by European powers at the end of the nineteenth century, East
Africa as a whole emerged under the control of a single colonial power.
The effects of this British rule and occupation is still felt in various
ways today.
Arab and Indian influence has had a much longer history than the European counterpart which in large measure has displaced it.\(^6\) The Periplus of the Erythraean Sea,\(^7\) dating from the first century A.D. and thought to have been written by an Alexandrian ship's master, indicates that trade between East Africa and the Arabian peninsula was almost routine in nature and that contact with such far away places as India and China was not unknown.

The Arabs were securely in control of the coastal belt and the off-shore islands by the time the European explorations brought them to East Africa in the fifteenth century. This coastal dominance was consolidated during the next three hundred years. By the nineteenth century when the British were finally taking political control, the Arab influence and commercial contact had penetrated inland and extended as far south as northern Zambia and Malawi.\(^8\) The Arabs were primarily interested in slaves and trading with the interior; it has been estimated that in the 2,000 years of Arab control up to 100 million people were removed from their homes.\(^9\) This decimation drastically re-
duced the interior populations to the point that "British intervention perhaps prevented the extinction of many groups whose land might slowly have been taken over by the Arabs and their allies." 10

On the coast, the Arabs intermarried with the Africans, a union that also mixed languages and resulted in today's Swahili. 11 The language is now spoken throughout most of East Africa but it is not the only aspect of life permanently affected by the Arab influence. Many aspects of trade and business, particularly on the coast, reflect the continuing Arab heritage. And, the presence of dhows in the harbors also reminds one of the existence of a large segment of the population that is and probably always will be more Arab than African or European.

While the Indians have not been in East Africa as long as the Arabs, they nevertheless have been there a long, long time. By the end of the Middle Ages, trade relations between India and East Africa were almost as important as those between East Africa and the Persian Gulf. 12 And although the Indians, like the Arabs, were not much inclined to explore the vast interior, they were in marked contrast to
the Arabs very adept at and interested in finance and retail trade.

It was not until after the British penetration of the area, however, that Indians seriously moved to the interior. The railroad brought the greatest inward migration although some twenty years before some of the leading Indian merchants had extended their business into Uganda. The Indian community was keenly interested in developing the trade of the area but, like the Arabs, they had little desire to develop the natural resources of East Africa. Even today, while many Indians are actively engaged in important aspects of resources development, including water, more are engaged in trade and business pursuits.

Little is known of African societies in the interior before the coming of the Europeans since no written records exist and the many oral traditions vary in reliability, have been lost altogether, or have yet to be pieced together in a meaningful way. It is generally thought that the interior has been the scene of large population movements. In the late fifteenth or early sixteenth century, for example, there was
a large southern movement of Nilotic Luo peoples into the Bantu-speaking half of Buganda. Also during the sixteenth century, the Luo were moving up the Nile Valley toward an area now usually called Chope. They then went north to Acholi, westward to Alur and eastward into Lango country, passing on to the northeast corner of Lake Victoria. The Masai seem to have come south from the Lake Rudolf area into the Kenya highlands area and down into the Rift Valley and Tanzania.

In southern Tanzania, an area not influenced by either the Nilo-Hamitic or Nilotic peoples, a movement of Ngoni peoples took place in a northward direction from across the Zambezi.

In addition to these major movements, there has been constant movement among smaller units as agricultural and climatic conditions have forced peoples to shift locations. These major and minor movements are reflected in today's population distribution patterns. Africans are spread thinly over practically all of the country with occasional pockets of considerable density. It also explains in part why the Africans can form a large part of the urban population although the existence of a
large permanent African urban community is only a recent development.

The significance of the multiplicity of races for our purposes here goes much beyond the mere fact of race itself. While East Africa may properly be called a racial melting pot, little has actually melted in the sense that there has been broad sharing or intermixture of culture and traditions. It is tremendously important for our purposes that the Europeans emerged as the historically significant group in extra-economic areas. They have clearly been the moving force in water resources development and can properly be thought of as the father of the national water laws. Although this European group later was expanded to some extent to include important individual Indians and Africans who have contributed significantly to developments in water law, the trend today is toward Africanization which may eventually displace the European and Indian elements involved. The problem of racial intermixture in East Africa is by no means a recent development. There has been much dissatisfaction with the alleged refusal of the other races to fully integrate with the African population and, in Kenya, to subscribe to
Jomo Kenyatta's slogan of *harambee* (the native cry of "let us all pull together"). Religious principles have interfered with mixed marriages, economic considerations have often encouraged the employment of the sons and daughters of the non-African rather than the Africans, and African customers have long been charged—as much as the traffic would bear—with the profits safely deposited in the banks of Delhi and London.

In 1967 Tanzania reacted against this situation and forced out hundreds of non-citizen Asians. Subsequently, a considerable number of businesses previously controlled by Asians were rationalized. Kenya followed quickly with the declaration that the permits to stay and work, given to the some 125,000 Asians that had opted for British citizenship at the time of Kenyan independence, would probably not be renewed when they expired. This event coupled with a change in British immigration policy restricting the number of East African Asians allowed into the country caused a virtual migration of Asians from Kenya in the days before the British exclusion took effect. By 1970 some 25,000 Asians had left Kenya for Britain, India, Canada, or other parts of Africa.
Uganda has followed suit and adopted as one of its developmental goals under the most recent five-year plan "the Ugandanization of the economy in the most rapid and orderly fashion possible." This policy has primarily caused a shift in the personnel occupying important political positions but has caused many non-Africans (primarily Asians) to leave—many as a result of direct governmental edict.

The water laws of the respective countries themselves incorporate very little of the African, Indian or Arabic heritage. They are understood largely in terms of European legal concepts. They are administered according to European procedural methodologies and involve, in short, very little from the non-European society in which they must function.

It must be observed that while the British ruled in East Africa for the better part of the past century and had such a significant impact on the development of their legal systems, as we shall see in greater detail in subsequent chapters, most areas were and still are, on the local level, very strongly inclined in direction of Arab or Indian or African culture. And although many of these areas have 'westernized' (to use the term
quite loosely), many of the ethnic and cultural traditions have not been abandoned altogether. It is in this social environment that the laws, including the water laws, must operate. Race, then, is important because of cultural traditions and societal patterns and not so much to the understanding of the origin of water law as to the understanding of how it can possibly function in a society with which it has so little in common.

Religion

The role and importance of religion in the East African development picture is largely ignored or at least greatly underestimated. Religion is closely tied to all stages of the history of non-African penetration into the area and accounts in no small measure for the peculiar attitudinal coloration of the cultural milieu found today in Kenya, Tanzania and Uganda. Further, aspects of the religious law have worked themselves into the accepted public law of many local areas if not in the national laws of the countries themselves.

From a missionary standpoint, two religions have distinguished them-
selves in East Africa: the Muslims and the Christians. Neither group, however, proselyted in a religious vacuum. When Christian missionaries arrived they found that most of the inhabitants were used to the idea of one God but, unlike the Christians, they did not conceive of him as bothering about what happened among men. 22 Several examples illustrate this. The Kikuyu, in Kenya, worshipped a god who lived on Mt. Kenya and was a god of love. He concerned himself with man only to punish him with famine, disease and death when he disobeyed him. 23

The Masai, also of Kenya and borderland Tanzania, believed in a god but had no word for soul, or spirit nor for the spirits that had departed. They had no word for good and had nothing to denote bad. 24 To them, man was just another beast that would perish.

The Kamba thought it was wasteful to offer sacrifices to their god as he lived in the skies too far away to be influenced by them. They offered their oblations to the spirits of their departed who, they believed, lived in fig trees upon their departure from mortality. 25

Most of the tribes had their own theologies but it was generally
missionaries of a multiplicity of denominations.

In spreading the "good news" of Christianity, the missionaries relied heavily on the services of African converts. By 1893 seven Africans of mature age were ordained deacons and three years later three of them became priests. By 1938 the African clergy outnumbered the European missionaries and by 1950 they exceeded their non-African counterparts by a ratio of four to one. Even though the Roman Catholics have Africanized at a somewhat slower rate, today it can be said that European missionaries are required now only for specialized aid.

As the indigenous people are providing their own clergy, a pattern has been developed that has been emulated in the field of secular government. And as the missionaries turn to give their attention to medicine, education, and the under-privileged in urban areas, that, too, has been seen as a good example for government to follow. Often the inroads made by the church in these areas have provided the stimulus and generated the necessary pressure for similar government action.

The impact of Christianity, in terms of numbers of converts or in
terms of its indirect impact on societal life through attitudes and institutions, has been the greatest of all the outside religions and even overshadows that of the Africans' own religions. As a result, the non-Christians in East Africa frequently conduct their daily affairs in a social environment that smacks highly of Christianity even though it may not outwardly be considered such. Many of the laws as well reflect elements of the Muslim, Hindu, African, and Christian ethics. And as religious precepts are often the most effective determinant of how one deals with nature and his physical environment, a very direct, albeit, subtle impact is had on natural resources development. As we shall see, a clear example of such an impact by the Christian ethic will be seen in the earliest statutes dealing with water rights in Uganda.

Land Tenure

In East Africa particularly, but undoubtedly the case elsewhere in the world, "Land is the physical basis of all human activities. It is the foundation of prosperity of a nation." Although the natural environment around him has had a tremendous impact on the selection
and development of man's political and social institutions, the ques-
tion of land ownership itself has often been at the very center of that impact. 'Man is a land animal, and land matters mightily to him. His talents and energy indeed can take him far; but his roots are no less on the earth than those of any tree and his achievement is much affected by what he makes on the land he lives on...'32 And the ownership of that piece of land into which he sinks his roots has been a motivating goal of tremendous power.

In developing nations generally, and in Africa in particular, land is and will be for a long time to come the primary source of development capital. As one East African authority expresses it:

Whether they succeed in progressive industrialization or not, land is the major resource of these countries; the way it is used today and the obstacles to its more efficient use are thus of paramount importance. It must be soberly assumed that in most developing countries neither trade, nor aid, nor foreign investment will provide [the] major share of capital required to finance economic development....33
Typical of the East African feeling toward the importance of land is that contained in the Arush Declaration: "Land is the basis of human life and all Tanzanians should use it as a valuable investment for future development." The feeling in Kenya is very similar. The report to the recent UN conference on human environment makes it clear that "the people of Kenya are totally dependent for their existence on a thin nutrient filled layer of topsoil, the rain that falls on that soil and the energy of a benevolent sun working through the plant life rooted in it."

There are also often strong elements of a social function associated with ownership, that all are affected by the ownership rights of the one, and the one's rights are conditioned and determined by the needs of all.

Land tenure is concerned with human jural relations to land and as such defines how people acquire and dispose of interests in a given piece of land as well as the extent and nature of their interest. The bases for such interest may be statutory, predicated upon provisions
of enacted law, or customary, derived from particular long-standing customs or usage practices. Often the interest one has in the land also determines what one can do with the elements and resources that are found below the land or that pass over the land. In this context, the impact on water law, water use and development is substantial and can be easily seen. In Uganda, for example, the Public Lands Ordinance of 1962, section 24(2) sets out the following relationship between particular types of land ownership (tenure) and water use rights:

All rights in the waters of any spring, river, stream, watercourse, pond or lake on or under public land (whether alienated or unalienated) shall be reserved to the Government, and no such water shall be abstracted, dammed, diverted, polluted, or otherwise interfered with, directly or indirectly, except in pursuance of permission granted by the minister in accordance with such procedure as may be prescribed; provided that nothing in this subsection shall prevent the reasonable use by an occupier of unalienated public land of any such waters for agriculture, pastoral or domestic purposes only. (emphasis added)
When one considers the various interests in land that are observed in East Africa, the multiplicity of form and origin and the extensive lack of uniformity is impressive indeed. Land tenure, for example, as it has developed in Uganda, has little in common with certain aspects of land tenure in Tanzania and the same can be said with respect to land tenure in Kenya. Much of the diversity is attributable to types of tenures deliberately created by governmental action. Not infrequently these 'new' tenures are at variance with traditional concepts of ownership and use. Often, too, the new tenures favor those with the economic ability to acquire and protect the land holdings. This situation is not always stable and in all three countries there is much pressure to reform the land tenure systems. Many things have been done in recent years to remove the inequities of present tenurial systems. In Uganda, the cry for reform is nearly universal among academicians as well as politicians. Chango Macho has argued that without some reform the development targets of the various development plans will be difficult to attain. Kanywanyi has sug-
gested that one of the major problems facing the country is that of customary land tenure and land usage practices associated with it. Further, Obol-ochola concludes that 'There seems to be no doubt... that the question of whether or not land tenure reform is necessary is popularly answered in the affirmative.'

In Tanzania pressure for reform is most strongly felt in the direction of collective ownership rather than as a movement for an individual piece of land. Under the concept of Ujamaa villages people will be brought together on land owned in common and worked together by all for the good of all in a cooperative effort designed not only to increase production but to implement the principles of socialist society adopted by TANU (Tanganyika African National Union). Development of such villages is given high priority under the Second Five Year Plan and has become a functional goal of the party. This priority is reflected in the following provision of the Second Five-Year Plan:

The Water Development and Irrigation Division will
speed with which reform has become a national cause is due to some of these localized efforts. One recent examination of the situation reports the following:

... There was a nagging land-hunger among Africans, especially the Kikuyu, and specifically for the rich highlands fields which the whites had taken from them. This hunger erupted in the bloody Mau Mau rebellion in 1953, which became the rallying point for the movement which eventually swept Kenya to independence a decade later.

There were 7.5 million acres of fertile land in the old White Highlands. Simple justice, simple political common sense, dictated that an increasing proportion of this good earth be turned over to the indigenous population and, in the first few years after uhuru (independence), more than 2 million acres were bought from their former white owners and offered to land-starved black citizens.

But these attempts at reform generally only shift the impact of tenure from one institution to another or affect the degree to which particular institutions are influenced. Often unless radical measures are
taken, tenure will be a problem for years to come. Land tenure, under whatever system, has and will continue to profoundly affect the process of water resource protection and development in East Africa. It is an extremely complicated area and it is hardly possible to do it justice in a very limited space. Nevertheless, several generalizations are possible and useful.

In Kenya, the land problem has been associated with a tenure system introduced by European colonists, particularly the British and with the changes occasioned by independence from the British. The British were initially not particularly interested in settlement in Kenya but focused their attention on Uganda. The reason for such an interest was two-fold: they wished to cut off the slave trade at its roots, and they wished to reach the source of the Nile which had been discovered in 1863. The only practical way to reach Uganda was from the Indian Ocean at Mombasa to Lake Victoria. In 1901 a railway between those points was completed and the East African Protectorate faced the financial responsibility of its maintenance. Although the ultimate destination of the
railroad was Uganda, in 1899 a rude town was established at about
the halfway point in the midst of a mosquito-laden swamp which the
Masai called nyarobe—the place of water. The presence of the
Europeans was not exactly unexpected although the natives had no rea-
son to believe what would happen when they came. Long before their
arrival, their coming was predicted by the Kikuyu tribe, Kenya's
largest. Also predicted was the laying of the "iron snake." It
did not take the British settlers long to recognize the geographical
facts of life as well as the strength of their position and realize
that most of the precious 13 percent of Kenya that was suitable for
intensive cultivation lay in the highlands that stretched from Nairobi
to the Uganda border. Whites swarmed to this fertile area which was
by tradition Kikuyu land and it is not surprising, given the above-
mentioned fulfillment of prophesy, that the British were able to buy the
land from the Native Kikuyu who had no way of knowing that they were
deeding the property in perpetuity, contrary to their traditional law.

Because of the need for African labor, the new colonists did not
want their workers living too far from them. In 1906, under the direction of the Earl of Elgin, then Secretary of State to the colonies, various lands were reserved for the settler-farmers while others were left to the natives. As the settlers increased in number, more land was needed and demanded and colonists did not want their chances for land expansion limited by reserving land to the natives. At that time, the Colonial Administration in Kenya set up five native reserves for African Agriculture but the boundaries were not fixed until 1926 and even then the arrangements were not permanent. The African reserves were agreed upon only after assurances that the Europeans could lease new lands as they needed them but even with that provision, rapid appropriation took place due to the moderate policies of the Colonial Administration and the inability to control the pressure generated by the settlers who were entirely disinterested in the native populations.

The land tenure policy up until the independence had its root in the Crown Land Ordinance of 1902 and its Amendment of 1915. The Crown Lands Ordinance allowed land to be sold in the name of the Crown to
Europeans for life, or under 99-year leases. The 1915 amendment declared that all native land was Crown land and the natives were therefore tenants-at-will of the Crown. When this system is compared with the natives' tradition pattern of land tenure, one can appreciate the magnitude of the change. Under the general Bantu system of ownership, tenure is better understood in terms of kinship ties. It is not exactly true to say that the land is "collectively owned" or that it is owned by the individual but the individual is an owner only in relation to the tribe. In so far as there are people of his own blood who depend on the land for their daily subsistence, the individual is not the owner but the trustee for others.

The most pressing problems associated with the colonial tenure system stemmed from the fact that the land alienated by the Crown became known as the White Highlands and comprised most of the fertile region around Nairobi in the highland of Kenya. In reducing the facts of ownership to acres, the settler-farmer averaged 3,460 acres while the native African held only 23.6 acres.
Independence brought further changes. The Constitution confirmed the existing titles and interests in the land. Most of what used to be Crown land was vested in the regions. A central Land Board was set up to purchase land in what were known as scheduled areas (generally the White Highlands) and to resell or convey for settlement purposes—not necessarily to Europeans. The most sensitive area of all, involving Trust Land, saw the land and the power to administer it vested in county councils. These councils held the Trust Land for benefit of the persons ordinarily resident on that land and had to give effect to any rights vested in any tribe, family, or group or individual by African customary law. If central or regional authorities acquired Trust Land for public purposes, full compensation had to be paid and when the land was no longer necessary for the purpose specified, it had to be offered back to the council. If land was thus acquired, customary rights were extinguished. Further, the council could extinguish customary rights by setting the land apart for specified purposes, provided, of course, that compensation was paid for the cus-
ony rights so affected. The trust of this aspect of the law was
to firmly vest the non-public land of Kenya in the hands of the local
authorities who could protect local interests. 51

Not only are many different tenurial forms found in Uganda, the
problem is additionally complicated by fundamental questions of legal
theory. Since Uganda was declared a protectorate by the British,
rather than a colony, it has been disputed whether radical title to
all the lands in the protectorate was vested in the Crown in the same
way as the English doctrine of tenure stipulates for Kenya. 52 Ini-
tially, the legal theory assumed that the declaration of the pro-
tectorate gave the British government little legal power to control
the land. 53 This theory was later modified to the point that the
Crown could appropriate waste or unoccupied land in those protector-
ates where there was no "settled form" of government and where land
had not been appropriated either by individuals or by the sovereign. 54

Buganda, one of the kingdoms in Uganda, was treated by the terms and
stipulations of the 1900 Uganda Agreement (one of the agreements secur-
ing the protectorate) as a country where there was a settled govern-
ment. In this area, existing rights had to be confirmed and lands
that were already appropriated were considered mailo lands and the
absolute title was in the mailo owners. 55

The origin of mailo land is interesting. The concept of
individual ownership of the land was alien to Buganda custom. Never-
theless, large tracts were allocated by the protectorate to the rul-
ing hierarchy as private property on the incorrect assumption that such
grants would confirm their interest in the land. 56 Mailo land is con-
fined to Buganda and differs from freehold land in that the Crown
held the mineral rights in the latter, and in that mailo land could
only be held by Africans and could not be sold to non-Africans
(although it could be leased to them, with the mineral rights reserved
to the owner). 57

Land not privately owned, either as a freehold estate or as mailo
land, was vested in the Crown as allowed by the Crown Lands (Declaration)
Ordinance of 1922. 58 This, in essence, vested the Crown with all
land held on the basis of customary tenure which situation continued until independence. Under the 1962 Public Lands Ordinance, all former Crown lands were declared public lands; freeholds and Mailos were not retained by the Ordinance. In addition, all former Crown lands occupied for governmental purposes were vested in the Uganda Land Commission and all public lands in the several federal states or districts were vested in federal land boards or district land boards.

In 1967 further changes were made consolidating the federal and district lands under a national land board called the Land Commission for Uganda. Under the 1969 Public Lands Act the power to lease, manage, and alienate all "public lands" was vested in the Uganda Land Commission. Since freeholds and Mailos were not considered official estates alienated during the protectorate, they have therefore been unimpaired by the recent changes.

At present in Uganda, as a result of the above-mentioned historical development, there are five main systems of land tenure. These are the freehold, Mailo, leasehold, license, and customary tenure.
Each in its peculiar way differs from any equivalent English common law concept. Freeholds, since 1916, have been largely held by Africans and cannot be acquired by non-Africans. In 1916 the Secretary of State decreed that there should be no further alienation of freehold estates to non-Africans on the theory that Uganda was a protectorate and not a settlement colony. This decision was appealed to the Governor but was rejected in Britain. With the enactment of provisions for title registration an additional category of freehold tenure was established. Under the Crown Lands (Adjudication) Rules, enacted in 1958, an African who validly held a piece of land under the customary law could register his title and it was recorded as a freehold. Finally, as a result of recent statutory changes, all public lands have been vested in freehold in the Uganda Land Commission which is the body that can grant freeholds or leaseholds to individuals.

Under the Land Transfer Act, rights of African proprietors are severely restricted in the sale or transfer of any interest for which
they are registered, and no disposition may be made to any non-African
without the previous consent of the Minister. 67

Mailo tenure has already been mentioned but several additional
aspects merit consideration. Today, to alienate property to a non-
African, permission must first be secured from the Minister respon-
sible for lands. 68 In many respects, mailo land is thus similar to
freehold land now and Mailos which were once official estates have
been abolished and vested in freehold in the Uganda Land Commission.
In addition, Mailos are preserved only in the Districts of Bunyoro,
East Mengo, Masaka, Mubendo and West Mengo and in all cases the
entire property interest in and the control of all minerals and
water is vested in the Uganda Government. 69

Leasehold estates are very similar to the English common law
equivalent. However, slight differences are encountered in that
there are two types--statutory and private. The statutory lease-
hold grows out of relationships created under the Crown Lands Ordin-
nance or the Public Lands Act. Originally, they could not endure more
than 99 years and were the only estates granted to non-Africans. All leases bore development conditions and could not be alienated, except by will, without the permission of the Governor. Although the statutory authority has changed over the years, the conditions under which the leases were granted have remained substantially the same.

Private leaseholds bear a more marked resemblance to the English common law equivalent in that they are contractual relationships between Mailo owners or private freehold owners. The conditions applying to statutory leases do not apply to these leases as the duration, terms, and rental amounts are determined privately. The only major restriction is that where a lease is to be granted to a non-African, consent of the Minister must be sought. 70

One further development might be mentioned. If an African holds by customary tenure, he may apply to the controlling authority to grant him a leasehold estate in the public land occupied by him and such a leasehold interest may be created out of a customary tenure. 71

 Licenses are similar to English common law equivalent and need
little discussion here. Licenses are granted for certain specific purposes and are usually for an unspecified duration. Historically, the licensee required a certificate from the commissioner authorizing him to hold the land described and then only for a period not to exceed 21 years. Certification could not be granted for land cultivated by natives or native communities. Further, if the land involved was needed for purposes of development, the governor could evict the tenant at any time without compensation.

Statutory changes have all but eliminated the significance of the licenses. Today, the Uganda Land Commission can grant annual tenancies for purposes of erecting building of a temporary nature or for the development of natural resources.

Customary tenure is perhaps the largest system under which an interest in land is possessed today in Uganda. It is important to note that customary tenure carries no connotation of possession of a fee title (as might be the case under the English Common law) nor are the customary estates even the equivalent of a leasehold since there is
no payment of rent nor development conditions imposed on the estate.

The system differs from place to place with the interest possessed being dependent upon whether the tenure system is tribal, by clan, by village, by family, or by individual. The trend is toward individual tenure and the whole system is being gradually modified. "The present customary tenure in Uganda is a result of many contemporary social, economic, and political forces." As conditions have changed in recent years, many of the postulates that supported one particular form of customary tenure have been eroded or replaced with the following resultant situation:

The institution of Kingship has been abolished in Uganda by the 1967 revolutionary constitution. Tribal tenure where ownership is vested in the rulers or kings is therefore now defunct. Some elements of feeling by members of a tribe that the land within the tribal boundary is owned collectively or communally by the tribe still exists. Clan, village, and family tenures are still predominant, but in the densely populated areas there is a general trend towards individual tenure...
Finally, in the districts of Toro and Ankole, tenures peculiar to those areas are found that are of minor significance. In some instances, life estates were granted for meritorious service in the district administration. Also created were certain landlord-tenant relationships that were to be governed by the Crown Lands Ordinance and the subsequent Toro and Ankole Landlord and Tenant Laws.

As noted above, certain types of tenure have been tied to developmental conditions or use restrictions. These perhaps more than any other single factor affect water use and development. Related to the problems of land use that are generated by the multiplicity of tenure forms and their resultant relationships to water development. Uganda (as well as other nations of East Africa) faces the additional problem that regardless of the type of tenure involved, some land is rendered useless and closed by the government from occupation altogether by the invasion of the Tsetse fly, regardless of the tenure involved.

Much progress has been made in recent years to combat this situation but it is still a major factor in land use and development considera-
tions and often affects development of water sources that may be found in infested areas.

In Tanzania, the land tenure problem is often thought to be a direct outgrowth of the political history of the country. Tanzania, unlike the other nations in East Africa passed through a period of German administration. After the success of the Allied powers in the World War I, Tanzania was administered by Great Britain as a Mandated Territory (later a Trust Territory) under the surveillance of the League of Nations and later the United Nations. Independence from Great Britain brought the country to "African socialism" pursuant to which it is presently governed.

The interests in land created during the German period were by and large vested in the Custodian of Enemy Properties and were auctioned off in the course of the war liquidation. Thus, except for a few grants which were of the nature of a freehold interest, and were most certainly converted to the equivalent of the English fee simple (though the point is much debated), little remains from the
German period. Very few freehold grants date from the British period as well. As a Trust Territory, the British were limited in much of their land use policies by the Trustee-ship agreement that was entered into which provided, inter alia, that "in framing laws relating to the holding or transfer of land and natural resources, the administering authority should take into consideration native laws and customs, and should respect the rights and safeguard the interests, both present and future, of the native population." This provision was implemented in the Land Tenure Ordinance which had the effect of declaring all land, whether occupied or not, to be public land, held for the benefit of indigenous people of the country. Foreigners had a right of occupancy and could acquire freeholds only under certain limited conditions.

After independence, the Freehold Titles (Conversion and Government Leases) Act was passed that converted all freehold lands into government leaseholds on the theory that it was necessary for all the land to be owned by the people as a whole. The principles used to support such a policy were more of a throwback to traditional tribal rules than a giant
radical step in the direction of socialism. First, land belonged to society, not to individuals, with the government acting as trustee or caretaker. Second, one's right to land was dependent on the use one made of it. Third, land was not a commercial commodity.

Just as in Uganda, social and political factors have been at work and have modified somewhat the effect of the above principles on the actual situation. Functionally, the present situation might be classified into various sectors--traditional, public, private and collective. Land tenure, however, in the traditional sector has not adhered religiously to the idea that private property had no place in an African society and geographical, demographic and historical factors have contributed to the entrenchment of a system that has defined the rights of the individual or of the group in terms of "ownership" and which allows for the sale, purchase and lease of such lands. The collective sector is, at present, highly theoretical and experimental although efforts are strenuously pressed for the development of Ujamaa villages.
The public sector is concerned more with the relationship between the state and the subjects, including Parastatal bodies and companies that hold land directly from the state—either under governmental leases or other interests. Finally, the private sector contains many of the estates and interests introduced by the English colonial administration and is thus the tenure system's most easily understood by those familiar with the English common law.

Taken as a whole, the overwhelming past of the country involves a land tenure system based on native law and custom or some similar concept of collective ownership. Rules of ownership, even when the result of native governments, have never been uniform nor have the rules been static.

Tanzania, as has been the case with Uganda and Kenya, has benefitted (or suffered as the case may be) from traditional alienation restrictions imposed on the various ownership interests. Also found in common with the other countries of East Africa are general rules giving the state control over the subsurface minerals and the water, so
that even if one were able to acquire a freehold interest or a facsimile thereof, one would only acquire rights to use the surface.

**Political Development**

Any analysis of water law administration will focus, sooner or later, on the actual institutions involved. Such a focus generally includes a look at the rules, regulations or legal norms that have a bearing on decision-making as it relates to enforcement and administration of the nation's particular water laws. However, underneath it all are the broad currents of political interaction, political ideology and political behavior that, until most recently, have not even interested scholars of political science—let alone of water rights—at least insofar as they have been related to the political and economic development of a country. 87

It is practically impossible to describe here, even briefly, the political development situation for any of the nations of East Africa even though it is recognized that no area of governmental administration, including something as inconspicuous as water law, can be fully under-
stood and appreciated without at least some feel for this facet—and
the better the feel—the better the understanding. Here, as with land
tenure, the complexity of the subject prevents its thorough examination
in a few pages and likewise here, as with land tenure, only general-
izations can be practically dealt with.

Any discussion of development subsumes comparison. A system is
inevitably compared either with what the system once was or with what
other systems once were or are now. While it is true that comparison
is valuable in that it leads to a conceptual knowledge, often one
wonders if the comparison matrix must not be selected arbitrarily just
to have a vehicle that will facilitate analysis. It is imperative to
note that, as a rule, comparison is not conducive to a knowledge of
detail, and since this is a book on water law in East Africa rather
than on political development, a conceptual framework for analysis is
more important than the peculiar details that can be adduced from the
same mass of data for each separate country.

An inquiry may be considered comparative if it pro-
ceeds by the use of an analytical scheme through which different societies may be systemically compared so that, by the use of a single set of categories, their identities and uniqueness may be discovered and explained. The analysis is comparative if the explanation draws on variables and the value of variables that are applicable to the description and analysis of societies widely different in time and place from that under immediate consideration. Any inquiry into a particular society will be considered comparative if its descriptions and explanations assert, imply, or permit the systematic juxtaposition of that society or of some sections of it with other societies or their corresponding sectors.

One is tempted in making such a comparison to draw on variables associated with one's own society, particularly if that society is "Western." In such a situation, it is very difficult to avoid the value judgement that if the society under consideration fails to conform to the "western" norm as described by the variables chosen, the society is on a "lower" or "inferior" level of development. Such an approach unfairly prejudices the situation and somewhat precludes
effective analysis.

The initial determination in any discussion of political development concerns the dimension of the system under consideration. Political systems have been variously defined, with some definitions allowing for analysis of a greater segment of society than others, and it is difficult at best to chose the definition that is most suitable for the particular type of analysis undertaken. Almond, for example, begins his classification with an emphasis on "roles" and defines political systems as the "patterned interaction of roles affecting decisions backed up by the threat of physical compulsion." Such a definition is satisfactory for purposes here although others are certainly available.

The next consideration is the selection of a comparative model or matrix. This is an even more troublesome proposition due, in part, to the unavailability of a completely satisfactory one.

A model is an explicit statement of the structure which a scientist expects to find in any mass
of data. The structuring of expectations is implied in any theoretical formulation. The construction of a model additionally requires that the structure be made explicit with reference to concrete "sets" of data which it is intended to organize. Modeling thus becomes a method of genuinely integrating theory (a structure of expectations) and research (a mass of data) by means of explicit postulates and hypotheses.

Since every system exists in at least two time-planes, more than one model is generally necessary to completely describe the society. First, the system needs to be described in terms of the historic, or developmental plane, and second, it needs to be understood in terms of its present or functional plane. And, it is not infrequent that more than one model is appropriate in locating the system in either plane. In the case of the nations of East Africa, it is necessary to combine models.

Considering first the historic plane, Black described the development process as a combination of events that, depending on their order or degree, tend to define the location of the society along a
is accompanied by the emergence of the group we might denominate as the advocates of modernity. The way national societies appear to have been constituted, it seems entirely possible for the country to pass through this phase on a national, urban, political level long before the crisis is passed or the confrontation is even made on the level of the most remote and unassimilated tribal society within the country. In fact, this situation is probably the norm in most African nations, including East Africa.

Second, there must be some consolidation of modernizing leadership. This generally involves a transfer of power from traditional to modernizing leaders and often follows a three-stage sequence. Initially, there is an assertion on the part of the political leaders of the termination to modernize. This is followed by an effective and decisive break with the institutions associated with a predominately agrarian past permitting the transition to a more industrial way of life. This, in turn, finally results in the creation of a politically organized society. This process of consolidation is often long and
painful. The role played by TANU (Tanganyika African National Union), the only political party on the mainland of Tanzania, is a good example of how long and drawn out this process can be. While there can be no doubt that the party, under the direction of President Nyerere, has adopted modernization as the national goal and has become the locus of power for the modernizing leaders, much of Tanganyika is still not effectively controlled by the party structure. One recent study suggested that "TANU is unable to manage political affairs at the local level... central TANU organs cannot exact the desired responses from regional and district party bodies; and... there is a great deal of deflection from orders and plans made at the center." Further, TANU is, indeed, hierarchically organized and led by a charismatic leader. Yet Tanganyika is only partially and intermittently ruled by the national TANU modernizing elite."

The next phase is even more protracted and involves an economic and social transformation in which there is an accession of modernizing leaders and the development of a society to the point it is predominately
urban and the focus of mobilization of the great majority of the
population is toward the society as a whole rather than toward local
communities and specialized groups. In most African nations, in-
cluding those of East Africa, modernizing leadership is still consoli-
dating power and support and the associated period of economic and
social transformation is still far in the future.

Finally, it is postulated that there follows a phase directed
at the full integration of society. The ultimate end of this phase
is hard to foresee as it perhaps has yet to be reached by any nation.
Paradoxically, the integration is to be accomplished as a result of a
great movement of peoples from the countryside to the city as a result
of which there can be efficient utilization of human resources and great
functional specificity in social roles. This situation is to lead the
nation from one of relatively autonomous regional, organizational, and
occupational groupings to one that is highly fragmented and in which
the individual is relatively isolated.

Not all nations go through the above phases with the same degree
of rapidity nor with the same finesse. Scholars have suggested seven patterns into which the 170 politically organized societies he studied could be conveniently grouped. Uganda, Kenya, and Tanzania all fall together in the "seventh" pattern. This pattern, which fits most other subsaharan African nations as well, involves societies that did not have religion, or language, or political institutions sufficiently developed at the time they faced the challenge of modernization to be ready to accept the new conditions without extensive borrowing of ideas and institutions from other modern societies. These have been retained more or less as they were adopted. Such an explanation would account for most of the present water law regimes of East Africa and, additionally, suggests why there are so many apparent 'western' roots found therein.

Common also to the nations of this particular development pattern is the colonial heritage that stimulated the initial phase of modernization, the "challenge of modernity," but at the same time delayed consciously the next phase, that of consolidation of political power by the
modernization leaders. TANU here again is an excellent example. On July 7, 1954, in Dar es Salaam, TANU was founded. Within the short period of four years it became the overwhelmingly dominant political organization in the country outside of the government. In 1960 a "responsible government" was formed with President Nyerere as the chief minister. On December 9, 1961 Tanganyika gained its independence and Nyerere became the Prime Minister. In 1962 a new Constitution was adopted and Nyerere became president. Thus, in eight short years, the party and the individual have risen to the pinnacle of power (a position they occupy still over ten years later). However, given what was said above about the degree of control exerted by TANU over the country as a whole, it would seem clear the British, in their administration of the country since the end of the First World War, had managed to keep most of the forces TANU had sought to capitalize on in effective check (although evidence is available to show that there was considerable political activity among Tanganyikan Africans since before World War II).
In determining the precise location of the countries of East Africa along a continuum of modernization, a look at an additional model is appropriate. Riggs has suggested an ecological model that looks at the development of society from a functional approach, more akin to the above-mentioned definition of political systems suggested by Almond.\textsuperscript{107}

Under the Riggs model, societies move through a progression of three stages that may or may not parallel their movement along Black's continuum.\textsuperscript{108} The first stage is the most rudimentary and is referred to as a "fused" society. At this stage, there is little role differentiation and the locus of power and decision-making is in the hands of the traditional elites or family-tribal structures. On the advanced side of the scale, societies are characterized as "refracted" and show a very high level of role differentiation, an intellectual class, Western-style offices, and the modern gadgets of administration. Sandwiched in between is the stage referred to as 'prismatic' which shows a high degree of "heterogeneity" or mixture of "fused" and "refracted"
traits. The essential features of the "prismatic" society include a high degree of "formalism" (meaning a discrepancy or congruence between the formally prescribed and the effectively practiced), and a high degree of "overlapping" (meaning the extent to which formally differentiated structures of a refracted--or modern--type co-exist with the undifferentiated structures of the fused--or traditional--type). In such a situation, it is common to find government offices, parliaments, elections, markets and schools set up but find the effective functions of administration, of politics, economics, and education to be carried out by family, religious, caste or communal groupings.

In the major metropolitan centers, such as in Nairobi or Kampala, society might well have developed to the point that the "prismatic" model is no longer the most appropriate analytical tool. However, among the smaller towns and tribal groupings it may well very accurately describe the level of development. And in the most remote regions of the countries, among the Turkana, for example, society may still be in the "fused" stage.
Since we are concerned here primarily, if not exclusively, with the stage of development only as it relates to the national administration of water law, we are not concerned with particular tribal groupings except as they relate to the broad proposition of ethnic assimilation and then only as an indicator of movement in the direction of a "refracted" society. So, excluding for the moment the "exceptional" circumstances of what is perhaps the greatest part of the country (both in area and in population), we might suggest as a working generalization based on interviews with and data collected from governmental personnel, that the countries of East Africa, at least as far as the administration of their water laws is concerned, are generally at the stage of political development where goals of modernization have captivated the imaginations of the political leaders. They, in turn, are struggling to wrest control from traditional power holders in a society in which are found many of the institutions of a bygone colonial administration and institutions from modern life that are inhibited in their effectiveness by the continuing operation of traditional acculturation and administration groupings.
In other words, they are generally prismatic societies, coming to grips with the challenge of modernity and the struggle associated with the consolidation of modernizing leadership and economic transformation.

All of this, of course, colors one's expectations as to whether the system of administration that is statutorily provided for in the water codes is ever actually implemented in the field as it is written and also what one's expectations ought to be when one ponders how and when changes are likely to come about once the inadequacies and inequities of the present water laws are understood.

Turning to the actual functioning of the present political systems in East Africa at the above-outlined stage of development, examination of still an additional model is necessary. Almond and Powell postulate that one can understand how a system functions by understanding the processes involved in rule-making, rule application, and rule adjudication. The particular processes involved that are of concern here are interest articulation, interest aggregation and communication. This six-fold matrix is referred to as the "conversion process" by which
Easton's demands and supports are converted into a flow of extraction, regulation, distribution and the like from the political system into the society.

The conversion process is supposed to function as follows:

(1) demands are formulated (interest articulation); (2) demands are combined in the form of alternative courses of action by the structures whose function it is to aggregate interests. It is deemed best that each particular group articulate its own interests (interest aggregation); (3) choices are made and authoritative rules are formulated (rule making); (4) these rules are applied and enforced (which in the more developed society involves structures specifically designed for administration) (rule application); (5) these applications of rules are adjudicated in individual cases where obedience is deemed inconvenient or inappropriate or undesirable by the individual (rule adjudication); and finally (6) these various activities are communicated both within the political system and between the political system and its environment (communication).
The more developed the particular system, the more specialized the structures are supposed to be and the more responsive are the outputs to the content of the input. However, in every system, no matter how developed, the particular conversion process takes place. An understanding of the stage of development combined with an understanding of the functional process should aid somewhat in understanding the particulars of water law administration.

In East Africa, legislative, administrative, and judicial structures are fairly easy to locate—at least superficially. If one looks at the situation in the context of the previously mentioned development models, however, and in the context of water law and administration, the situation is not so clear. The Uganda parliament, for example, may not be the actual effective legislative organ of the country at all, particularly if the overlapping or formalism in the system is excessive. The situation is further complicated when one looks at the institutions that aggregate and articulate interests. Superficially, at least, the political parties, farms, and labor groups and other similar organizations that
have always existed would be expected to fill that role, but in Tanzania,

"no interest and associational groups exist which could be used by TANU
to effectuate its rule. Thus, TANU must itself organize such associational and interest groups (for example, TANU farmers or cooperative organizations, TANU literacy groups)". In Tanzania, then, if it should appear that the water legislation proposed by TANU is not exactly what the country needs (if that is indeed the case) one might be well advised to focus on the particular groups that have been organized to articulate the need for the present legislation to see if they were at all in touch with the problems of the nation's water system. Additionally, when one considers the relatively recent nature of the water law legislation itself and how matters of water rights have been traditionally included only as a marginal item in the public land acts of the past one can appreciate how any articulation of interest at all in this area is in itself a recent phenomenon and is in some measure an indication of the development of the political system. And conversely, one can appreciate that as the system has developed, structures allowing for
articulation of interests favoring specialized water law legislation have been developed (albeit overtly by TANU) which in turn have directly caused the very existence of specialized bodies of law. Of course, whether this is the actual case or not with respect to water law will be explored in subsequent chapters. One might even go so far as to suggest that perhaps a primary reason Uganda has had no history of specialized water law may not be so much as a result of water abundance in the country as many have argued, as much as a result of a particular political development that the country has found itself in prior to and since independence.

Economic and Social Development

While the topics of political, economic and social development have been separated for purposes of discussion, it should be made clear that they are very interrelated. Many have argued that the economic aspect of modernization has been so dramatic that it should be regarded as the central and determining force in this process. In fact, however, it is more true that economic development itself depends to an even greater
extent on the intellectual and political leaders to mobilize resources.

To illustrate, when it is said that the political leaders are committed to a national goal of modernization, what is usually meant is that they seek for their countries' increased economic development, usually in the nature of increased industrialization based on some 'western' pattern. What is not so clearly understood, even by the modernizing political leaders themselves, is that their success in reaching their goals of modernity may well depend in large measure upon their success in developing effective political institutions that are capable of mobilizing populations and resources in the direction of their goal. In other words, it would seem that economic development cannot be accomplished through development or manipulation of purely economic factors alone, and failure to predicate efforts in this direction upon parallel political and social development may actually result in much of the frustration and instability often associated with development problems present today in East Africa.

One is impressed with the sense of urgency with which the 'under-
developed countries' pursue their goal of economic development. One reason suggested for this is that the nations see the need for a higher growth rate as an inescapable fact of contemporary life, upon which elements of national legitimacy depend:

The imagination of many of these nations have been fired, perhaps most of all, by the remarkable way in which the Soviet Union has raised itself to the status of a Great Power by its own bootstraps and in short span of time. The expansion is also demanded by the ex-colonial status of many of these countries: assertions of equal status ring hollow unless they are matched by economic strength. Several nationalist governments have also come to power on the promise of progress, nourished over the years on the thesis that foreign rule denied prosperity. Democratic forms of government, left as a legacy to some of these areas, also make the system vulnerable to insufficient growth and hence keep it alive to the issue. Even dictatorships have sometimes shown themselves sensitive to the perils implicit in an unsatisfactory rate of growth.

In many cases, even though the commitment toward economic devel-
opment is there in the new political leadership, entrenched interests continue to stand in the way of goal achievement and the resultant situation often threatens to be explosive, or depending on the strength of the entrenched interests, to be even reactionary against economic development.

In determining the present status of the countries of East Africa, with respect to levels of economic development, some understanding of the economic development is intimately associated with the two interrelated and essential functions of savings and investment and argues that "traditional economies tend to consume virtually all that is produced, leaving little for investment and growth." Although these traditional economies may be virtually self sufficient, producing most of the food consumed, clothing and implements used from resources locally available, they lack the degree of role differentiation and specializing necessary to permit the production of any marketable surplus. Once a surplus is generated, savings can be increased and greater investment made.
As the society specializes, there is a marked trend toward urbanization which in turn "generally involves a significant transformation of the family from the larger kinship units normally associated with agrarian life to the much smaller nuclear family consisting only of parents and younger children." 116

While economic development has the effect of leveling incomes, education, and economic opportunities, it is not generally accompanied by a similar leveling of social or political roles. What does happen most frequently is that the composition of the elites undergoes some reformation. Equally striking are the increases in literacy, forms of communication, and improvement of health as a result of technological developments.

All this means, of course, is that while the fundamental problems of human nature and human relations do not differ very much from the modern as opposed to the traditional society, the means with which they are dealt do vary as well as does the environment in which they are confronted. Taking the process of economic development as a whole, it might
aptly be characterized as being simultaneously destructive and creative leading to the ultimate conclusion that modernized societies are not necessarily more civilized but only that they have increased their capacity for dealing with the same age old problems of man and his environment. This is particularly evident in matters of pollution control and environmental protection. As countries become increasingly committed to the goals of an industrialized society, the tendency to pursue this goal at any cost is often evident and any serious restriction, for example, in the form of emissions standards is often thought undesirable as it would effectively increase the expected cost benefit ratio and thus scare away or at least discourage capital investment by the few in the country (or the many out of the country) who are disposed to invest. It matters not how otherwise desirable the measures may be in view of the "enlightenment" or "high level" of civilization one would expect to be associated with increased health awareness and educational expansion. It should not be surprising therefore that strong environmental protection measures are the exception rather than
the rule in East Africa given the present level of economic development. And, it is not surprising that "in Kenya today there is no laid down policy as to who is ultimately responsible for matters pertaining to sewage," 117 or that it can be reported in Uganda that "whatever pollution is caused by industrial and mining production in Uganda represents a side effect of activities primarily undertaken in the interests of economic and social development. 118

Looking at the countries individually, in Kenya there has been a considerable African migration to the few major cities. Taken as a whole, however, "over 90 percent of the population live in rural areas of the country" although there is a tendency toward concentration in three distinct population regions. 119 Along Lake Victoria from the slopes of Mount Elgon to the Tanzanian border is found the westernmost cluster. 120 A second well-defined region extends northward from Nairobi toward the Aberdares, Mount Kenya and Nyambeni. Finally, along the Indian Ocean from the Sabaki/Galana River southward toward the Tanzania border is found the third major concentration. It is impor-
tant to note that these areas show a considerable correlation to altitude, rainfall, and land fertility and reflect "earlier population regions which were well established in pre-colonial times in response to natural conditions of the land." It must be noted, however, that there has been a slight modification in the pattern of population due to settlement changes and land policies of the colonial and post-colonial phases.

Urban populations, on the other hand, accounted for 9.9 percent of the total population of Kenya at the time of the 1969 census. This population is located primarily in the highland urban centers dominated by the capital city of Nairobi.

The rural/urban configuration is being altered significantly by three factors that indicate movement along the economic development continuum. First, there is an acceleration in the rate of growth of the total population. At the time of the 1969 census, the total population stood at 10,942,705 and was growing at the geometric rate of 3.3 percent per annum. This is a rise from the 2.64 modal rate for the
period 1948-62. This increased rate of growth is attributable to a sharp decrease in the death rate, a sustained high birth rate and an increase in the youthful structure of the population. To attempt to control the increased birth rate, a national family planning program has been developed that has been recently put into action and hopes for success are, at this point, quite high.

Internal migration has also shown a trend toward urbanization and clearly falls into two categories. There is a shift in the rural population from the less to the more prosperous and developing farm areas in other districts. It must be noted that many of these shifts are considerably restrained by traditional territorial imperatives. Secondly, there is a marked shift from rural areas to economic growth points in the urban areas. Nairobi, the Coast Province and the Rift Valley are the primary destinations of these rural-to-urban migrations. Increased population pressures in urban areas have generated a pressing need for increased quantity and quality of housing as well as jobs and services.
A major benefit produced by the migration to the urban centers is that Africans are increasingly able to participate in an organized market economy and develop the basic skills necessary to organize the marketing of their own produce and to participate in simpler industrial processes. Even so, the region's natural resources are more susceptible to agricultural enterprise rather than mining or heavy industry. It is not surprising that "the greater part of the region's economic activity should take the form of agricultural output and that the majority of the indigenous workers employed in the 'modern' or 'capitalist' sectors of the economy should be relatively unskilled and hence able to command only low rates of pay." 

Industry is still relatively undeveloped in Kenya although in a comparative sense, it is better developed in Kenya than in Uganda or Tanzania. As of 1964, only about 10 percent of the Gross Domestic Product was directly contributed by industry. Since then, this proposition has changed reflecting an increase in industrialization but Nairobi is still the major manufacturing center and employs the lion's share of
the African labor force. Recent years have also shown increases in
employment figures for administration, governmental employment, trans-
portation and domestic services as well. Information released in 1972
shows a decrease from 38.1 percent to 30.6 percent as the contribution
of Agriculture and Forestry to the Gross Domestic Product for 1964 and
1970 respectively and an increase in the manufacturing production quan-
tity index (1964=100) to 109.1 for the same period.

As increased emphasis is placed on industrialization, water re-
resources planning has necessarily required more attention and recent
changes in the laws to reflect the increasing need are evident. In-
creased urbanization as well has considerable impact on water use and
resources planning. Many changes need to be made to keep up with the
needs of development. It is estimated, for example, that only 15 per-
cent of the total rural population presently enjoys a piped water supply
and only about 9 percent of the total population is supplied with treated
and piped water through municipal or other supplies. At present rates
of correction, it is estimated that it will take until the year 2000 to
satisfactorily supply water to all rural areas.

Although these and other related examples are topics for discussion at a later point they are mentioned here to illustrate the correlation between the stage of economic development that Kenya finds herself and our overall area of concern with water law.

In Uganda, the situation is not markedly dissimilar from that of Kenya. As something of a preface to the Third Five-Year Development Plan, 1971/2-1975/6, entitled Development Manifesto, the following language is used to express Uganda's commitment to modernization:

Uganda's development effort is directed at one overriding objective, namely, to enable every citizen of this country to enjoy the maximum level of economic and social welfare consistent with increasing economic independence.

The specific goals selected by the government to implement that stated policy are also worth noting:

1. Securing a rapid, steady, and sustained expansion in the per capita production of goods and services, and such transformation of the structure of
of the economy as will facilitate expansion.

2. The Ugandanization of the economy in the most rapid and orderly fashion possible.

3. Promoting a more equitable distribution of incomes and wealth among all sections of the nation's population, particularly through emphasis on rural development.

4. Generating a substantial increase in employment opportunities.

The official position in Uganda is that "the most serious socio-economic problem facing Uganda at the present time is the very low level of total and per capita income." Much of this problem, the statement continues, is due to the fact that "Uganda's economy is still heavily dependent upon caprices of the weather and of the world market." In a real sense, there is much merit to that argument. Uganda depends for most of its foreign exchange as well as domestic employment on an agrarian economy that is very much influenced by the effects of weather on growing and harvesting conditions on the one hand and on world prices for exports on the other. The latter condi-
tion—dependence upon the world market is tied to the dependence of the economy upon actual external support. Ownership of many, if not most, of the productive enterprises in the country is in the hands of foreigners, and foreign manpower and finance is strongly felt in both public and private sectors.

On the other hand, the level of foreign investment in the productive process in Uganda is still below what could be absorbed with benefit to the country's development. The problem has not been the relative amount of foreign capital so much as the relative inability to raise sufficient domestic capital to share in the development process.

As in Kenya, the income disparity in the country correlates with the urban/rural configuration, and the population pattern is subject to many of the same factors as are found throughout East Africa. The total population, as of 1969, stood at 9,548,847 which was growing at the annual rate of 3.8 percent. Unlike Kenya, however, a significant part of the rate of increase has been due to immigration from
abroad (including about 200,000 refugees from various surrounding nations). Once this immigration is discounted, the crude birth rate suggests a growth of 3.2 percent. Uganda, in common with Kenya, shows an increasing proportion of young people in the total population and some decrease in death rates.

Density of populations in Uganda is often disproportionate to the amount of people that the given land can comfortably support. For the country as a whole, the density is about 50 people per square kilometer (excluding water surfaces) but in areas such as Buganda, density rises to 170 people. Looked at in somewhat different terms, 23.9 percent of the population is carried on only 3.7 percent of the land area. There is a concerted government policy to open up sparsely settled areas and there has been a demonstrated willingness of the people to resettle spontaneously apart from any government. This results in a rather strange migration pattern from rural to rural areas rather than from rural to urban. This is not to suggest, of course, that there is no problem of rural/urban migration but even
though urban populations have more than doubled since the 1959 census, "the proportion of the total population living in urban areas is still small, and, strictly speaking, Uganda is not yet faced with an acute problem of urbanization." 145

The growth in the towns is difficult to measure because many have recently changed their boundaries. However, it is reported that "the growth of some of the towns can be partly explained by the expansion of industrial activity." Kampala, Jinja, Tototo and Kasese are cited as good examples. Other towns, on the other hand, owe their growth to such things as the establishment of district services. Considering all of the variables and generalizing it is clear that part, if not most, of the growth associated with towns is due in some respect to factors that would induce movement from rural areas to urban centers. 147

The problems associated with the population trends are similar to those in Kenya if only in kind rather than degree. And their impact on water use and development is similar. New industries demand more resources allocated to their needs. Increased populations need more and
better housing facilities. Water and sewage lines must be developed or expanded. Planning must assume a larger scale. More services must be offered.

A good example of the interrelationship between economic growth and water resources planning is seen in the continuing controversy over a proposed hydroelectric plant at Murchison Falls (one of the major tourist attractions of the country, receiving about 70 percent of the foreign visitors to the country). The controversy has gone through a fairly regular cycle of government favor and disfavor and seems to be in a constant state of either being played up or being played down.

When Uganda became independent in 1962, power was a major problem sector of the economy as well as an essential ingredient for economic development. At that time, although the huge Owen Falls hydroelectric scheme was successfully attracting industry to Uganda, the financial strain on the controlling Uganda Electricity Board was becoming acute. With the passing of years and the investment of considerable money, the
Owen Falls scheme has become a highly successful venture, but it has become increasingly clear, however, that the Owen Falls plant cannot carry the anticipated power demand for the future. With this in mind, the government formulated a plan to install a similar plant at the Murchison Falls. Immediate controversy resulted.

In a statement prepared the 19th of July, 1968, by the Director's Office, Uganda National Parks, details of the proposal were made public. Originally the plan was proposed by the Chairman of the Uganda Electricity Board and was prepared by electrical consultants to the Board. Construction was to take place over a 20-year period employing some 1,000 men. At that time, the estimated cost would have been one billion, two hundred million dollars (one thousand two hundred million dollars). A site about one kilometer from the falls was selected and a dam was proposed above the falls that would divert 90 percent of the flow of the Nile River underground to the power plant. The water was to return to the river below the falls. The falls are a spectacularly narrow gap of roughly 20 feet in width where the entire current of
the river is forced into a 140-foot plunge to the level below. After the intended diversion, it was suggested by critics of the proposal, that the water which would have passed through this narrow cleft would have been the equivalent of only a medium-sized stream rather than the mighty mile.

Arguments immediately came from conservationists arguing that the location of any population at all in the area (which is a game park as well) would increase poaching, scare the animals, scar the land and drive away the tourists. Others argued that the reduced flow over the falls itself would be no longer attractive to the tourists who, in 1969, were supposed to have contributed over six million dollars to the Uganda economy. It was also argued that the anticipated demand for power could be met with several smaller hydroelectric plants on the Bujagali, Bmyala, and Kalagala Rivers.

The government appeared to back off in the face of these arguments but the chairman of the Uganda Electricity Board was on record as having summarized his attitudes towards the wild animals, and tourists, with
the following language: "To hell with the animals and the tourists," and soon allegations surfaced to the effect that the electrical consultants to the Board had been motivated by certain self-serving objectives in designing and formulating the Murchison Falls project.

By 1969, however, the project had been revived though not officially, but suggested by language in a publication intended for consumption by tourists.

"The raw material of any industrial revolution is a ready source of fuel."

"In Nineteenth Century Europe this was coal. In Twentieth Century Uganda it is hydro-electricity. With no known coal or oil deposits, Uganda is nonetheless fortunate in that among its countless rivers are many which are ideal for electricity generation. . . ."

"The construction of the Owen Falls hydroelectric scheme, which is capable of producing 150 MW, has enabled Uganda to have one of the most extensive transmission networks of any developing country in the world."

"However, soon a new source of power will be required. A decision therefore has been taken to erect a new power station."
"After careful consideration of the various sites available, and of the advantages of inter-territorial co-operation with Kenya, the Government has selected the Murchison Falls area as the site of the new plant."

The details released were substantially the same as for the earlier proposal, and an attempt was made to refute earlier criticisms. Evidence has been offered to suggest that unless a power plant or something similar takes some of the pressure off the falls, the river is threatening to carve a new less precipitous channel to the Mediterranean that will bypass the present site of the falls altogether. The facility would be underground, and special emphasis was given to the fact that enough water would go over the falls (without any specification of quantity) "to impress even the most blase tourist."

This was substantially the position well into 1971. Again opposition forces, however, did not take the renewed interest in the power plant lightly and increased their efforts to defeat the project and by the summer of 1972 the project again appeared as if it had been
killed and an official of the Uganda Electricity Board, during the interview with the author, stated that as of June, 1972 there were no plans for a hydro-electric plant at Murchison Falls. However, recent Presidential speeches of selling power to the Congo and the Sudan suggest a revival of the idea of a power plant. However, nothing has been printed except classified papers which are not available to the public. 155

Whether a power plant is ever erected at the falls concerns us little here. What is important is the apparent willingness of the government to abandon what had clear overtones of a "development at any cost" program in favor of giving at least superficial consideration to the aesthetics of the area, the wildlife, and the appeal the area would have to tourists if left unspoiled. At any rate, the falls controversy illustrates how the problems of development spill over into nominally unrelated areas and directly involve significant aspects of water use planning.

Tanzania is passing through more or less the same stage of eco-
nomic development as is found in Kenya and Uganda. There are notable areas of difference that ought to be considered. The economy of Tanzania is largely rooted in the use of the land. As late as 1967 it was estimated that 96 percent of the population relied on agricultural activities for self-support or income. At that time over half of the Gross Domestic Product was attributable to Agriculture and related primary production.

Also in 1967 the Arusha Declaration was adopted at the TANU conference. In a recent speech by President Nyerere the effect of that declaration on governmental policy was quite simply outlined as it related to the problem of accomplishing either an increase in agricultural production or a shift in the direction of industrialization:

By the resolutions of the Arush Declaration we have decided that our Government and our people must work for economic growth in a manner which will bring benefit to all... Tanzanian is now in the second of a series of five-year plans. Under the first plan an effort was made to increase production and encourage-
ment was given to greater outputs. However, recognizing that it is fairly easy to produce textiles, cement, and similar goods as opposed to basic items of industrial capital and the goods that are used to produce other items, the Second Five-Year Plan has placed much more emphasis on economic planning. Targets for production output have been set as before but more sophisticated attention has been paid to how they will be realized.

At present the economy is expanding at about 4.3 percent. During the period surveyed, data suggests that the real rate was under-estimated and is probably in the 4.8-5.2 range. The goal set by the second plan is 6.5 percent but this raw figure tends to cover somewhat all of the progress intended. Planning is directed at improving the health, diet, and housing of the rural population and an expansion of the public investment in infrastructure.

Unlike Kenya and Uganda, Tanzania tends to put more emphasis on development in the rural sector as the key to fulfillment of the plan goals. "Emphasis on rural development means that the Plan
concentrates on agricultural expansion. However, rural economic
growth is not solely a question of agricultural expansion. Rural
development goes hand in hand with the provision of services to agri-
culture, an expansion in the supply of commodities and services to
meet the consumption needs of the rural population and improvement
of the channels of communication through which agricultural output
can be marketed. 163

Central to the concept of rural development is the previously
mentioned emphasis on Ujamaa villages. The concept appears strik-
ingly similar to the Mexican ejido and involves principles of col-
lective ownership and management, with all participants sharing in
the production. 164 The villages seem to be built on the principles
of the traditional extended family system with its emphasis on cooper-
ation and mutual respect and responsibility. The principle theoreti-
cally involved equal rights as well as equal opportunities and opti-
mally should produce a situation where there is "no exploitation of
man by man, and where all have a gradually increasing level of material
welfare before any individual lives in luxury." The stated objective is to farm the village land collectively with modern techniques of production and share the proceeds according to the amount of work contributed.

This lofty program is designed to reverse a trend in the opposite direction away from extended family production and social unity and appears to have been motivated by a growing tendency toward class distinctions in rural areas.

Also unlike Uganda and Kenya, Tanzania has embarked on a concerted program on governmental decentralization. While the concept has more impact on making "socialist participatory democracy a reality by giving the people decision-making power in matters affecting their development," the effect on the program is to create District Development Councils to replace the country's present 61 district councils. These development councils will "plan and administer local affairs with the very minimum of interference from Dar es Salaam." This will mean, as far as economic development is concerned,
that the primary impetus will come from the implementation of a very large proportion of agricultural programs under the direct responsibility of the districts and regions. Given what has been said above with respect to TANU having to create its own interest articulation and aggregation institutions, the District Development Councils appear to be a necessary precondition to effective implementation of the party goal of economic development as expressed in the Second Five-Year Plan.
CHAPTER IV
Water Law History

Background

Historically, East Africa has not always belonged to the Africans, at least as far as the development of the present legal structures is concerned. In Tanzania, the British took control from the Germans who acquired control as a result of earlier treaties with the British in 1886 and 1890. At that time, Germany based her claims on explorations in the early 1880's and upon treaties negotiated by, among others, Carl Peters with different tribal chiefs.

Illustrative of one such treaty is that made with the Sultan of Msororo:

Treaty of eternal friendship: Mangungo, Sultan of Msororo in Usagara, offers all his territory with its civil and public appurtenances to Dr. Carl Peters as the representative of the Society for German Colonization, for the exclusive and universal utilization for German Colonization.

It has been suggested that the treaties were signed by chiefs
ignorant of what they were about, and therefore did not deserve to be treated seriously. Further, since they involved areas that were part of the dominions of the Sultan of Zanzibar, they have been disputed as not having been transacted with parties actually capable of transferring the territory. Nevertheless, Bismark recognized and supported them, Sultan Barghash's vehement indignation to the contrary notwithstanding, and since the Sultan was powerless to do anything more than protest without the help of the British, when that help was not forthcoming, Germany's claim to the territory became secure. In August, 1885 instead of sending a friendly diplomat, Bismark sent a squadron of battleships and an ultimatum that the Sultan withdraw all protests to treaties made by Germans with the Sultans of Usagara, Nguru, Useguha, Ukami, and Witu or else Zanzibar would be spectacularly reduced to rubble. That appeared to cement German control of things in most of the area claimed.

As a result of the disputed claims of Germany to the Usagara area, the British Government was persuaded to take a more active interest in
the area and in 1885-6, the Zanzibar Commission met to determine the boundaries of the Sultan's authority. The Commission broke up without making the sought after determination and Great Britain and Germany began their own efforts to negotiate a satisfactory partition which produced two treaties. The result of the Treaty of 1886 and the subsequent Treaty of 1890 was to grant Germany a sphere of influence over what is now Tanzania and to grant Great Britain a similar sphere over what is now Uganda and Kenya.

It is important to note the negligible consideration actually given to the wishes of the Africans. While interest in Africa may have initially been generated by such sympathetic desires as that of destroying the slave trade, or of civilizing the native with missionary persuasion, as the power of the Sultan was reduced due to German or British influence, slave trade appeared to increase. And the belief among the natives grew that the white man really only wanted their land. Although the Africans themselves were unaware of the desire of the European powers to acquire the territory as a political
possession for strategic reasons without any interest in dispossessing individual landowners, the Europeans themselves gave little heed to the growing African fear until the matter erupted in bloodshed with the death of Bishop Harrington. 8

It is also important to note that actual development of the respective spheres of interest of Germany and Great Britain was undertaken, not by the countries themselves but by commercial companies. The German East Africa Company was started in 1888 and received a concession from the Sultan to administer the mainland opposite the Sultan's sphere of interest on Zanzibar. Similarly, a royal charter was granted and the Imperial British East Africa Company began to administer the British sphere slightly to the north. While the companies may have been primarily motivated by economic considerations, fairly clear political control was deemed imperative and soon the company flag was hauled down in Kampala on April 1, 1893 by Sir Gerald Portal, to be replaced by the union jack. A protectorate was declared and soon the administration of the Imperial British East Africa Company's other
territories was taken over by the Foreign Office and what is now Kenya became British East Africa Protectorate on June 15, 1895.

In Tanzania, the German East Africa Company was more intent on acquiring the region for the prestige, political power and wealth of Germany. Sweeping changes were attempted that were successfully resisted, first by the Arabs, then by the native African populations. This eventually brought an end to the company's control and the organization, in 1907, of a separate Colonial Office to administer the African colonies.9

In Uganda and Kenya, Colonial administration brought with it the law of the mother country, the common law of England. Of Uganda, it is reported that "the advent of British rule imposed a foreign legal system, basically that of England."10 Another authority corroborates stating that in Anglophonic Africa, English law "provides the residual law of the territory..."11

It is beyond argument, of course, that the English law, as applied in Africa, was not identical to the English common law in
all respects. Local pressures and conditions had a significant impact upon the institutions developed as well as the content of the law itself and peculiar circumstances often produced interpretations of rules very unfamiliar to one well versed in the English common law.

In Kenya, the effects of the peculiar social and political milieu into which the English law was introduced can readily be seen in the court structure, for example. From the time of the first local legislation dealing with courts in 1897 a triple system of courts has had some role to play in legal matters.

One set of courts had jurisdiction over matters which concerned the English colonists and consisted of the High (later the Supreme) Court, the courts of appeal above it, and the lower courts staffed by administrators applying an English-type law and procedure.

Another set of courts, primarily on the coast, in the dominions of the Sultan of Zanzibar, was staffed by Arab officials and applied both Muslim and English-type law. These were known as Muslim courts and were always classified as subordinate native courts rather than
native courts.

The native courts, staffed by Africans, applied primarily customary law and a 'common sense' approximation of English-type law and procedure. These were largely administrative courts.

The courts were maintained throughout the Colonial period as three separate and distinct systems despite considerable overlapping of jurisdiction as well as law. For example, an African was subject to the jurisdiction of both the native and the English courts and, if they were Muslims living on the coast they were subject to the jurisdiction of the Muslim courts.

While this tripartite system of courts did not survive independence, much of the law developed by the early courts, particularly the English courts, still has a bearing on legal developments today. Early cases, even though decided in the English courts, are binding in analogous situations today involving Africans. As a result of the post independence reforms the whole system of African courts was transferred from the realm of colonial political administration to
the judiciary. It was felt perhaps that the earlier colonial view of the British system as something that could not be introduced into Kenya in its entirety had, in fact, resulted in the introduction of only the inferior aspects of that system at least as far as Africans were concerned. Reform, then, was equated with making the superior aspects of the British system available to all Kenyans.

Although in Uganda and Kenya there seems to have been a recognition of the existence of and the need for native law throughout the colonial period, even today, in Uganda at least, there seems to be a highly developed body of customary law in certain geographic or legal aspects. Neither native nor customary law seems to have played a significant role in the development of the countries' water law codes and regimes in either Kenya or Uganda and in both countries the roots of water law are deep in the "received" British colonial laws.

Uganda

It has been suggested that until recently there has been no well-
defined body of water law in Uganda. While this is not technically true, it may be true enough. On the other side of the coin, it might be hypothesized that when the English common law was received in Uganda, the common law of water rights was received as well. One authority suggests this possibility:

> From the total context of the situation, one must assume a riparian doctrine to be in use, although its applicability seems not to be specifically stated; . . . . In Britain, and as applied throughout the British Empire, this devolved into arrangements for sharing water on a *prorate* basis, as between users during times of short supply. 16

If Uganda ever officially operated under such a "received" body of law it is not evident from the statutes or cases. Traces of water law development must be pieced together from many sources, some of which approximate the English common law and some of which do not.

In the Crown Lands (conveyance) Rules of 1905, one finds the following:
§3. . . a conveyance lease or license for the temporary occupation of crown lands under the Crown Lands Ordinance of 1903 shall not confer any right to the waters of any river or lake.

While the above provision suggests that the waters of rivers and lakes belongs exclusively to the Crown such that all rights can be retained anytime the lands were leased, certain rights were deemed to be available to all. In every lease, implied by virtue of Ordinance No. 2 of 1903, a covenant was found to

... permit travellers to encamp with their servants, animals, wagons and baggage, for a period not exceeding 48 hours, on any part of the land leased which is uncultivated, and which is not within a quarter of a mile of a dwelling house, and to allow access, with their servants and animals, to any river, stream, or lake upon the land leased. 17

A similar provision also applied to any land purchased from the Crown. Thus, not drastically dissimilar to the English common law, as a general rule, the waters and bodies of water appear to have been vested in the Crown and, since the beginning of British control, cer-
tain rights to the use of the water have likewise been recognized and protected in all transactions in which an interest in land was acquired from the Crown.

Also from this early date are seen the beginnings of regulation through permits, a concept that has only recently come into vogue among those who profess to follow the English common law riparian doctrine. In the same Crown Lands (conveyance) Rules of 1905 we find the following significant provisions:

No stream or lake may be dammed up, diverted or in any way interfered with, directly or indirectly (e.g. by sinking a well so near as to draw off the water) without permission.

Application for water rights should be made separately to the land officer, and should in his opinion there be no possible objection, the land officer may give 'written permission from time to time to dam up, divert, or use the water for temporary purposes for a period of not more than one year.' Should, however, in his opinion, there be a possible objection, or should the right be applied for for a longer
period than one year, a copy of the application shall be published in the *Official Gazette*, and shall be posted by the land officer during 30 days at the land office or collectorate of the district in which the water right is applied for, or should there be no such office in the district at the office of the sub-commissioner of the province concerned.\(^1\)

Any objections to the granting of such water rights shall be made in writing to the land officer within 14 days of the date of publication of the application.\(^2\)

The objections, if any, shall be heard on a day appointed, of which the applicant and objectors shall have due notice, by the land officer, who shall decide whether such objections are valid or not.\(^3\)

If there be no valid objections to the granting of such application, land officer may grant the application.\(^4\)

The applicant shall pay the expenses incident to the application and should the application be granted, such fee, if any, for the permission as may be agreed upon.\(^5\)

Also of note, from this early period is the following provision
found in the mining code, Chapter 26, of Laws of Uganda Protectorate, 1910:

§34 The commissioner of mines shall have the power, and is hereby authorized, on the application of any person holding a digger's license, to do the following acts on, or with respect to, any public field:
(c) to enter upon any lands, and to authorize the cutting, constructing, and using of drains thereon, and of water-races, dams and reservoirs, and the taking or diverting water from any spring, pool, or stream situated in or flowing through such lands, and in order to use such water for mining purposes.

The above-quoted provisions form the earliest colonial water law and in many respects show a degree of completeness far superior to that contained in subsequent and even present legislation.

These early rules, found particularly in the Crown Lands (conveyance) Rules of 1905 were retained until 1962 when they were repealed by the Public Lands Ordinance of 1962. There is no mention, however, of a water law regime to replace that which was repealed.

In fact, in the entire act, only one provision related specifically
to water:

24.(1) Nothing in this Ordinance shall prejudice the operation of the mining ordinance which shall apply in respect to public land as if applied in respect to Crown land.

(2) All rights in the waters of any spring, river, stream, watercourse, pond, or lake on or under public land (whether alienated or unalienated) shall be reserved to the government, and no such waters shall be abstracted, dammed, diverted, polluted or otherwise interfered with, directly or indirectly, except in pursuance of permission granted by the Minister in accordance with such procedure as may be prescribed.

Provided that nothing in this subsection shall prevent the reasonable use by an occupier of an alienated public land of any such waters for agriculture, pastoral, or domestic purposes only.

An interesting comment was made, however, in the debates over the adoption of the Land Ordinance of 1962. Section 24(2) was amended to include the clause "whether alienated or unalienated" to make clear that the new provision applied to public land even after it had been alienated. At the same time, an attempt to add
"industrial" to the final clause of subpart (2) was defeated. In the course of the discussion over these two proposals, Mr. Slade, a member of Parliament, concisely sums up what was to be the essence of the new water law.

The whole point of subsection (2) of this clause is that rights in water, broadly speaking, belong to government and water may not be taken except in accordance with the Minister's permission. There is the exception created by the proviso in relation to the taking of water for agricultural, pastoral or domestic purposes, [but] it is not thought that abstraction of water for those purposes would be very great... 29

Clearly the thrust of the legislation was to allow the government authority to regulate industrial uses of water while assuming that there was sufficient water for other uses. Subsection (1) of section 24, however, makes it clear that the mining ordinance should not be adversely affected by the new law. In 1949, the mining code contained significant water-related provisions which would apparently still be in effect even after the 1962 legislation. Under the mining
code, it was prohibited to mine or prospect in or on any of the
lands or waters of Uganda without proper permission. The code then
provides:

Save as provided in paragraph (d) of section 33
of this Act, no water of any spring, stream, river,
watercourse or natural water supply controlled by
the government shall be dammed, diverted or in any
way interfered with, without the consent of the
Minister. 30

Section 33(d) referred to above provides that only so much water
may be taken as will enable the prospector or miner to test for min-
eral-bearing qualities of the land and it is further provided that
such use of water for testing must not actually interfere with, or be
likely to interfere with, any existing use of water. While such a
provision is doubtless useful, its application is hindered by the
lack of any accessible definition of "existing use."

Section 60 of the mining code provides that water permits, for
the specified purposes, were to be granted subject to the approval
of the Commissioner of Lands and Surveys. Such permits could be for
all of the water in the stream or for only a part of it and for such periods as the Commissioner should see fit. However, if the permitted use disturbed or interfered with any other right, compensation was to be paid.

Once a permit was secured it apparently could be transferred independently of the land. Section 101 of the Mining Act provided that after such a transfer of a water right, the person to whom it was transferred had 30 days in which to apply to register the permit in the office of the Commissioner. Where approval of such a transfer was required, the period for registration ran from the date of the approval.

The provisions of the 1962 legislation were supplemented by the Water Rights Rules of 1967, as amended by the Water Rights (amendment) Rules of 1967. These rules restated the general proposition from Section 24 that no person could abstract, dam, divert, pollute, or otherwise interfere with the water of any spring, river, watercourse, pond, or lake unless he held a valid water rights license. Applications
for these licenses were to be made to the Minister of the Ministry of Lands and Water Resources. The applications were to be published in the Gazette stating the place where the proposed plans for the diversion could be examined by any interested person. Any objection to the application was to be referred to the Commission of Water Development, or to the Commissioner of Lands and Surveys or both for hearings and investigation.

The Minister was required to decide on the application within two months from the last day for lodging objections and could, at his discretion, grant the license for the full amount applied for or a less amount or deny the application altogether, in which case he was required to set forth specifically the reasons for the denial.

In addition, the Minister was empowered to require, if deemed necessary, as a condition of the grant of the license, that the applicant construct and install at his own expense any water control or measuring device to the specifications approved by the Minister.

Fees were to be charged when the total quantity of water exceeded
annually five thousand cubic meters of water and varies depending 
upon the amount of water required.

In 1961 recommendations were made on thirteen applications 
for water rights by the Water Development Department. As of 
August, 1967 when the water rights rules went into effect, the 
Water Development Department recorded eight action water rights for 
domestic use, 119 for industrial use, including processing of 
agricultural products, none for stock-watering, 28 for irrigation 
use, and one unspecified permit. And, there were seven permits 
outstanding for mining use.

Ordinarily, no permit is required for a government user and for 
that reason none are reflected in the above totals.

In 1967 a proposal was made to adopt an appropriative system of 
water law for the country but it was never acted upon although some 
of the recommendations for administrative rules were considered 
though do not seem to have been incorporated in the 1967 water rights 
rules.
In 1969, a new Public Lands Act was adopted and provision was made therein for water rights under section 27. The language of the section basically tracked that of section 24 of the 1962 act with only minor differences.

In addition, the provision found in the 1905 Crown Land (Conveyance) Rules relating to the right of access of travelers to water was included but in significantly modified form. As included in the 1969 legislation, the right applied only to an officer of the government in the course of his duty, and then only for the period of time his duties should require.

In 1972 there was considerable pressure generated to completely revise the water law structure of the country and a proposal was drafted in the Water Development Department that was rumored to have been adopted although recent political difficulties have interfered with its publication. The new statute is reported to resemble very closely the Tanzania Water Code and varies from the Tanzanian document only where minor changes were necessary to adopt the law to the pecu-
liarities of the Uganda situation.

From the time the Protectorate was declared until the recent statutory revisions of 1972 there have been no reported litigated cases dealing with principles of water law.

The thrust of the development of water law in Uganda suggests several conclusions. There is the suggestion that riparian principles are to be observed, but there is no clear statement of such a doctrine in the statutes. If the English common law of water rights was received in the country it has never been explicitly recognized or relied upon in the formulation of any of the rules. It appears that Uganda, although having developed over the course of the past century a number of water law principles that have a riparian cast or an appropriation cast, apparently has not intentionally borrowed from either system. Thus, it may be said that while the Uganda water law has been ill-defined throughout its history, it is truly a unique product of the Uganda situation. Perhaps because there has been sufficient water for existing or proposed uses, little concern has been
generated over the existence of the regime and because few conflicts have ever surfaced, little need has been felt to refine the system beyond the simple statement that the Crown (now the country) owns the water and one uses it with explicit permission or with tacit permission (depending upon the quantity of water required and the use to which it is to be put). Seen in this perspective, then, it may well be that Uganda has not had a full-blown system of water law primarily because there has not been a need for such a system.

Kenya

In Kenya, as in Uganda, the common law of England was "received." The language by which such law became the basic law of the Colony is contained in Government Notice No. 337 of 1921:

1. (2) Subject to the other provisions of this order, such Civil and Criminal jurisdiction shall, so far as circumstances admit, be exercised in conformity with the Civil Procedure and Penal Codes of India and the other Indian Acts which are in force in the Colony at the dates of the commencement of this order, and subject thereto and so far as the
same shall not extend or apply shall be exercised in conformity with the substance of the common law, the doctrines of equity and the statutes of general application in force in England on the 12th day of August, 1897—save in so far as--(the above) may at any time before the commencement of this order have been or hereafter may be modified, amended or replaced by other provisions in lieu thereof by or under the authority of any order of His Majesty in Council or by any Ordinance or Ordinances for the time being in force in the colony. Provided always that the said common law doctrines of equity and the Statutes of general application shall be in force in the Colony so far only as the circumstances of the Colony and its inhabitants permit and subject to such qualifications as local circumstances render necessary.

7. In all cases, Civil and Criminal, to which natives are parties, every Court (a) shall be guided by native law so far as it is applicable, and is not repugnant to justice and morality, or inconsistent with any order in Council or Ordinance, or any regula-
tion or rule made under any Order in Council or Ordinance; and (b) shall decide all such cases according to substantial justice without undue regard to technicalities or procedure and without undue delay.

The common law of England, as noted above, was to be in force "so far only as circumstances of the Colony and its inhabitants permit." It might therefore be suggested that, as in Uganda, the English common law of water and water rights was partially but never fully or completely effectively in force.

Also, as is the case in Uganda, the roots of water law are to be initially discovered in early Crown lands ordinances.

The Crown Lands Ordinance of 1902 contained the following provisions with respect to water law:

3. A conveyance, lease, or license for the temporary occupation of Crown land under this Ordinance shall not confer any right to minerals in or under the said land, or to the waters of any river or lake.
14. Except where expressly varied or excepted,
there shall, by virtue of this Ordinance, be im-
plied in every lease under this Ordinance cove-
nants by the lessee—

(d) To permit travellers to encamp with their
servants, animals, wagons and baggage, for a per-
iod not exceeding forty-eight hours, on any part
of the land leased which is uncultivated, and
which is not within a quarter of a mile of a dwell-
ing house, and to allow them access, with their
servants and animals, to any river, stream or lake
upon the land leased.

29. (1) Travellers shall be allowed to encamp with
their servants, animals, wagons, baggage, for a
period not exceeding forty-eight hours, on any
land purchased or leased from the Crown under this
Ordinance, which is uncultivated, and which is not
within a quarter of a mile of a dwelling-house, and
shall be allowed access with their servants and
animals to any river, stream, or lake upon the land.

(2) Any person refusing to allow travellers to
encamp, or to have access to water, under this sec-
tion, or interfering with travellers who are en-
camped, or any traveller refusing after request from
the owner or lessee of the land to depart after the
expiration of the forty-eight hours, or interfering
if any way with the comfort or convenience of the owner or lessee of the land, shall be guilty of an offense, and shall be liable to a fine not exceeding 1,000 rupees, or to imprisonment of either kind not exceeding two months, or to both.

Some similarity will be noted between the Crown Lands Ordinance of Kenya and that of Uganda but there is much that is dissimilar. In addition, in Kenya there are surprisingly a few cases that aid in the construction of the legal principles involved. Early rules were promulgated in 1903 and again in 1909 which also aided in the construction of the legal principles but both were declared by the courts to be ultra vires.¹

In 1909, in the case of Bowker v. Secretary of State, 3 Kenya Law Reports 56, a suit for damages was brought alleging injury caused by the construction of a ditch and the resultant draining of a swamp. The Secretary of State cross claimed for wrongfully cutting and removing the dam and for an injunction to restrain Bowker from interfering with the project. Plaintiff argued that the watercourse arose
and ended on his own land; that the government had no right to water which had fallen since the land was leased to the plaintiff and that the water was the natural right of the riparian owner. Defendant argued that the dam was needed as a result of a water shortage and that the town had properly voted to divert water from the swamp.

The court, through Judge J. M. Barth, held that no damage had been done and that the stream was actually to be considered a river. That being the case, section 3 of the Crown Lands Ordinance of 1902 governed and "all right to the waters of the river is vested in the Crown, and would so vest if the whole length of such river were within the plaintiff's boundaries." This construction suggests that the Crown Lands Ordinance did not indeed adopt all the principles of the English common law. The court further stated that "it is clear that the legislature intended to prevent riparian owners acquiring rights which otherwise they might have acquired."^3

The Crown Lands Ordinance of 1902 was replaced with the Crown Lands Ordinance of 1915. The earlier ordinance, however, was again the
focal point of a suit brought in 1918. In the case of Jamal v. Singh, 7 East African Reports, Judge Pickering held that "Section 3 of the Crown Lands Ordinance of 1902 is merely declaratory of the Common law, except possibly, with regard to lakes," and suggested that ownership of the water itself should perhaps be distinguished from the right of user. Section 3, it was concluded, stated the common law rule that there is no private ownership of the water in a public stream, that the Crown could not grant water running in a defined channel, but that the common law rights of user remain to riparian owners and were to be recognized.

This apparent conflict was mooted somewhat by the Crown Lands Ordinance of 1915 but it appears never to have been litigated again. It is also important to note that section 3 only mentioned lakes and rivers. One commentator suggests that this also brings common law principles into force in Kenya: 'Water of springs, waters falling on land and underground percolating waters are not mentioned in the section and, therefore, according to common law, remain in the private
property of the owner."

While the rules of 1903 and 1909 were ultimately invalidated by the courts, provisions contained therein suggest that one must not conclude on the strength of Judge Pickering's decision in the Singh case, supra, that the common law of England relative to water rights was explicitly adopted in Kenya.

From the rules of 1903, published in the Official Gazette of January 1, 1903, the following is found:

Rules made under the Crown Lands Ordinance cannot in any way abrogate that Ordinance but merely supplement its provisions.

The present rules deal only with agricultural land.

Rules for the purchase of land under the Crown Lands Ordinance, 1902.

6. No stream or piece of water which extends beyond the limit of one holding may be dammed up, diverted or in any way interfered with either directly or indirectly (for instance by sinking a well so near it as to draw off water). Provided that the leave of the
land officer in writing may be obtained to dam up, divert or use water in any other way for temporary purposes for a period of not more than one year and provided that for periods exceeding one year a Crown lease for water may be granted.

7. All lands purchased from the Crown shall be subject to any irrigation rules that may be hereafter made.

11. No sewage filth or refuse shall be allowed to enter into or foul in any way any lake, pond, stream or water-course.

The 1903 rules restate the idea that no use of the water (riparian rights notwithstanding) could be made of public waters without a permit of some sort. Only three permits were ever issued before the rules were modified by the 1909 rules. Extracts from these later rules follow:

1. Under the Crown Lands Ordinance, 1902, a conveyance, lease or license for the temporary occupation of Crown land, does not confer any right to the waters of any river or lake.

Under the Crown Lands Ordinance, 1902, such conveyance, lease, or temporary license shall
not, unless otherwise expressly provided, confer any right to the waters of any river, lake or stream, other than to such water as may be required for domestic purposes upon the land sold, leased or occupied.

2. No landholder may construct a water furrow on his land without permission. The application must be made to the Land Officer, who will note on it what land the applicant holds, and the length of river or water frontage, and then forward it to the Commissioner of Public Works.

3. The Commission of Public Works will thereupon, in consultation with the Land Officer, direct an enquiry to be made by a Committee consisting of an officer of the Land Department, one from the Public Works Department, and two landholders. If it is proposed to take water out of, or through a Native Reserve, the Provincial Commissioner must be informed that he may direct the District Commissioner to attend the Committee.

4. The Committee will submit a report to the Commissioner of Public Works on the proposed project, the officer of the Public Works Department supplying the necessary professional information. Special regard must be had to the claims of the
other landholders on the water.

Each case will be decided on its merit and the applicant must abide by such conditions as may be imposed on him by the Commissioner of Public Works after considering the Committee's report.

5. The overflow of water used for private irrigation purposes must be returned to the river, lake or stream by each landholder within the boundaries of his farm, unless otherwise directed in writing by the Commissioner of Public Works.

6. Should the demand for irrigation from a river, lake or stream hereafter increase, owing to an increase in the number of farms, or for other reasons, or should the water in the river, lake or stream become unduly diminished from any cause, the Governor reserves the right to make a redistribution of the water on an equitable basis, and all persons shall comply with any orders which may be issued for this purpose.

7. It will be the duty of the officers of the Public Works Department from time to time to inspect the rivers, lakes and streams and the irrigation works on them, in order to see
that the conditions relating to each such work are properly observed.

8. No charge will be made for water used for irrigation purposes by persons authorized to use the same under these rules until March 31st, 1916.

The Governor reserves to himself the right to charge an irrigation rate at the end of this period, if after full enquiry such rate is justified.

9. Every privilege permitted under or by virtue of these rules shall be subject to any irrigation laws which may hereafter be made, and may at any time be cancelled by the Governor for failure to comply with any conditions or order or if the Governor shall be satisfied that such cancellation is required in the public interest.

10. The Commissioner of Public Works may permit officers of the Public Works Department to assist settlers by their advice in the construction of private irrigation works (when the services of a qualified civil engineer in private practice and with experience in irrigation schemes are not available.)
There shall be paid by the settlers to the Government for the services so rendered by officers of the Public Works Department such fees as the Governor may from time to time determine.

These rules make certain, even more clearly than the 1903 rules, that even private water rights of user and ownership are very much subject to Crown control and administration. Under these rules, 200 permits were issued before the Crown Lands Ordinances were replaced in 1915. However, rules under the 1915 Act were not promulgated until 1919 and 150 more permits were issued—in accordance with the provisions of the 1909 rules. Thus, it would seem that while the courts considered them ultra vires, the Crown continued to use them to allocate water rights despite (or because of) their apparent inconsistency with the common law of water and water rights. The thrust of these rules appears to have been to allow rights for the ordinary use of water but to firmly asset that water not required for ordinary use belong to the State which would grant user right by license.
The Crown Lands Ordinance, 1915\(^{8}\) repealed the 1902 ordinance\(^{9}\) and made several substantial and far reaching changes in the law of water rights. Under the 1915 ordinance, it was provided that

... a conveyance, lease or license under this Ordinance shall not, unless otherwise expressly provided therein, confer right to the water of any spring, river, lake or stream, other than to such water as may be required for domestic purposes under the land sold, leased or occupied under the license.

It was further provided that the Crown, through its representative, the Governor-in-Council could at any time enter upon the land sold, leased or occupied under the Ordinance for purposes which were considered necessary "for maintaining or improving the flow of water in any river or stream on such land" and could construct and maintain dams or divert any river or stream without paying compensation except for buildings or crops destroyed or damaged."\(^{11}\)

Finally, the Ordinance provided that permission was required before any diversion or obstruction of water could be undertaken.
from sources covered by the Ordinance:

Save as in any sale, lease, or license otherwise expressly provided, no person shall dam any spring, river or stream, or divert any water from any spring, river, stream or lake on any land sold or leased, or occupied under a license, under this Ordinance or any Ordinance repealed by this Ordinance or on any unalienated Crown Land except with the consent of the prescribed officer and subject to such conditions as may be prescribed by rules under this Ordinance or in any license or authority granted under such rules.

Any person who shall, in breach of the provisions of this section, dam any spring, river or stream or direct water from any spring, river, stream or lake, shall, on conviction, be liable to a fine not exceeding one thousand five hundred rupees in addition to the expense of removal of the dam or other work erected or done in breach of the provisions of this section, and it shall be lawful for the prescribed officer or any person authorized by him in writing, without any warrant, forthwith summarily to remove such dam or work and prevent such diversion at the cost of the party erecting the dam or causing the diversion.
Only one case was ever decided dealing with water rights under the 1915 Ordinance. *Hutson v. Stoker* was decided in 1918-19 by Judge Pickering. Although technically under the 1915 ordinance, the decision involved no rights granted by that ordinance. There the issue was whether one party was entitled to a servitude across the land of the other to enable him to share in the water supply of the Ngara River west of Nairobi. The servitude was granted, largely based on verbal agreements between predecessors in title and was granted some thirteen years before the suit. The judge determined that there was no India Act or local ordinance applicable and therefore applied what he deemed to be the "English common law."

The case is even more interesting in light of events surrounding the case but apparently not raised in court. A permit was issued by the Director of Public Works in 1913 to the defendant under the 1909 rules that allowed him to take a share of the river water for general farm purposes and to pass on a small amount to plaintiff for domestic purposes. The case makes no mention whatever of the permit nor ques-
tions the legality of the use of the water made by plaintiff (he used it for irrigation which was not traditionally seen as a domestic use in early English common law).

In a subsequent development of note, plaintiff again sued defendant in 1921 for cutting off his water and thereby damaging his crops. The case, however, never reached the courts as it was settled by arbitration in which the plaintiff awarded a considerable sum in damages.

The 1915 ordinance added springs and streams to the Crown's possessions (enumerated in the 1902 ordinance to include only rivers and lakes). As a result, whatever right one had under the common law to streams and springs was thereby limited to domestic uses. In addition, given the provisions of section 152, supra, any rights at all to rivers or lakes as well had been reduced to ordinary uses. All extraordinary uses seem to require some diversion structures and therefore required a permit. Finally, damming and diversion, even for ordinary purposes, was prohibited, arguably even in "dry" rivers, without a necessary permit. It has been suggested that the only common law
rights that survived the 1915 Crown Lands Ordinance are the following:
the right to private water wells using percolating ground water,
water of springs only for domestic purposes, rights in rivers, streams
and lakes only for ordinary use, provided no diversion or damming
takes place. 18

Although not mentioned explicitly in the ordinance, it has been
assumed that the ordinance did not alter the rights to redress under
the common law. Thus, damage caused by flooding, or impeding the
natural flow of water past the premises, or pollution of the water
to result in injury, would generate causes of action for which re-
dress could be secured on a proper showing of facts. 19

Rules for the administration of the ordinance were promulgated
in 1919 and provided for a permit scheme similar to the earlier
rules of 1903 and 1909. The rules are surprisingly short, having
only four sections: The two major sections contain the following:

3. All licenses and water permits heretofore issued
and granted shall for the period and subject to the
conditions therein appearing be deemed to be of full
force and effect as if the same were issued and granted under these Rules until deter-
mined or cancelled pursuant to the provisions therein contained or by process of law.

4. The prescribed officer may by license or other authority on such terms and subject to such conditions as to him appear reasonable and proper permit any person to do any of the matters and things mentioned in Section 152 of the said Ordinance.

This regime has been characterized as "the most autocratic law in the world," and in essence boils down to this: no person is able to use any of the water of the country for anything beyond domestic uses without authority from the Director of Public Works.

The simplicity of the rules is deceptive as an elaborate system of permits was eventually set up in 1924. Applicants were required to comply with some thirty general conditions, and the instances where permits were required were set forth. No permits were required for domestic uses provided no diversion or obstruction was required. No permits were issued for transmission of water.
from a stream to nonriparian land unless it could be satisfactorily demonstrated that the flow of the stream in dry weather was in excess of the reasonable requirements of all landholders fronting on the stream.23

Of particular importance was section 16 of the conditions which implied no guarantee of right to the amount of water permitted,24 and section 22 which allowed cutbacks in the amount of water permitted if certain circumstances justified it.26

Permits could be granted for a year or longer but, called yearly water permits and ordinary water permits respectively, no continuity of right to divert water was established by the yearly permits. One holding such a permit could obtain an extension only upon permission of the Director of Public Works.27

Finally, all works for diverting and using water were to be constructed in accordance with the provisions of the permit,28 at the expense of the applicant and maintained in an efficient manner to the satisfaction of the Director,30 and were personal to the
holder and could not be transmitted to heirs or successors.

It is interesting to note that the rules had separate provisions dealing with works on what was then designated native land. The rights associated therewith are broader than those granted other populations. Section 20 provides that "natives will not be liable for damage other than willful to works in a native reserve." Section 21 follows with provisions that "natives have the right to draw water from channels in the native reserves . . ." apparently without regard to the use contemplated or the necessity for diversion facilities.

Although the 1915 ordinance produced a substantial modification of English common law rights, as normally associated with riparian systems, it should be noted that there is nothing in the 1915 ordinance, the 1919 rules or the 1924 conditions that would suggest the adoption of any prior appropriation principles to replace otherwise abandoned riparian rules. Nevertheless, some commentators have seen the permit system as evidence of some borrowing of the rule of pref-
ference based on priority in time from prior appropriation systems.

Lewis, for example, on the basis of language in the answer to a question put to the Director of Public Works enquiring as to the extent of the guarantee conveyed in a permit, finds evidence that "the doctrine of priority of time" has been laid down "fairly strongly" in Kenya. The text of that reply was as follows:

"Effective utilization is regarded as the basis and the limit of any landholder's right to the use of water granted to him by a permit issued under the Irrigation Rules. These rules distinctly state that any permit issued under them is revocable in the public interest. Such revocation would under no ordinary circumstances be exercised except for public requirements of an urgent and imperative nature. The fact that adjacent landholders might see a possibility of increasing their area under cultivation provided a neighbor were deprived of water which he was effectively using, that is to say, without waste and in accordance with Gazetted Regulations, would not be held to be an urgent and public reason necessitating the reduction of the latter's privileges enjoyed under an existing per-"
mit. Short of the Government grant of an inalienable right to a stated quantity of water, effective utilization in a Government permit provides the utmost security for the continued enjoyment of privileges which a landholder can possess."

When one considers recent developments in modern riparian systems where permit systems have been engrafted upon the existing riparian structure, it is not unusual to find some form of preference given to existing legal uses over proposed uses. That in no way should be confused with the appropriation doctrine of first in time, first in right. Although there is some evidence of consideration given to water laws from western United States, in the development of subsequent water laws, there is no evidence that at this early date the permit system was consciously copied from any other jurisdiction with any intention, implicit or explicit, therein that rights in water were to be determined on the basis of priority in time.

As of 1925, the permits issued under the 1915 ordinance numbered
Few of these permits were for irrigation which is understandable when one considers the settlement pattern then prevailing in Kenya. It is probable, however, that the number understated the actual number of extractions or diversions.

By 1929 another substantial revision of the water laws was enacted but pressures, largely political, and an absence of rules to operate under kept the act from being implemented until 1935. On July 1st of that year section 145 of the Crown Lands Ordinance (supra), then considered to embody the colony's water law and the rules made thereunder, was repealed.

The 1928 ordinance provided for the organization of a Water Board with wide powers and the establishment of District Water Boards to assist in the administration of the ordinance. With the new structure, however, there appears to be no retraction from the broad principles of state ownership found in the 1915 ordinance. If anything, it is refined to provide for ownership of bodies of water together with the right to control and the power to alienate
the right to user, and establishes the machinery for exercising that
to power.

The new board was empowered to issue either of two documents
that would replace the permits of the old system. These, called
licenses and sanctions, would grant authority to divert, use, or
otherwise interfere with water from a Body of Water. Under a
license a water right was conveyed that was appurtenant to the land
or undertaking. A sanction, on the other hand, was personal and
could be issued for a period not to exceed ten years. A sanction
had no priority over a water right and would be the first to have
the amount of permitted water cut back if there was an unexpected
shortage. The new law enabled the conversion of yearly water permits
and ordinary water permits into licenses and sanctions respectively as
a general rule, if the appropriate requirements were satisfied and
proper application made.

The Kenya Water Ordinance, while not using the terms private
and public water, did distinguish between the two. Clause 4 declares
any "body of water" to be the property of the Crown unless that body of water is either (a) a swamp, the boundaries of which are wholly within the boundaries of the land owned by one landowner and which does not cross or abut against the boundaries of that land, and to or from which no stream flows that extends beyond the boundaries of that land (either continuously or intermittently) or (b) a spring situated wholly within the boundaries of the land owned by a single landowner and does not naturally discharge water into a watercourse extending beyond the boundaries of the land.

Clause 7 differentiated between seven different classes of use and it may be suggested from this that the country finally rejected most of the riparian doctrines developed in humid and water-plentiful England as having no place on the dry lands of East Africa. Implicit in the classification scheme is the idea of priority, not necessarily based on the idea of first in time first in right but on the idea that some uses require water even if there is not enough water for all. The seven categories are: (1) domestic uses, (2) public
purposes, (3) minor irrigation purposes, (4) industrial purposes, (5) power purposes, (6) general irrigation purposes, and (7) other purposes.

Finally, clause 36 reads as follows:

The right of a licensee to divert, use or store water shall be limited to the quantity or proportion of the discharge of the stream, whether it be normal flow or flood discharge, granted by the license, and in accordance with other right lawfully exercised under provisions of this ordinance:
Provided that every license shall be subject to cancellation or alteration by the water board by reason of waste of water, or non-use, or misuse or partial use only of the water right granted, or non-compliance with the conditions of the license, and if so cancelled or altered the water right shall thereupon be determined or be altered:
Provided that no license for a public project or urban project shall be cancelled. . . .

This provision further underscores the concern in the country with water economy and the grim realization that there may not al-
ways be enough water for all users. Here again, however, the yard-
stick used to determine cutback had no basis in the "first in time,
first in right" principle but considered only the particular situa-
tion of the individual permit.

The 1929 Act was almost immediately amended by legislation in
1936 but very little was actually changed, and dissatisfaction
soon became apparent. As a new water law was considered in 1950,
the following was said with respect to the 1929 ordinance:

... the existing water ordinance, the one
that is superseded by the bill that is before
the Council, was passed in 1929, as it was then
felt that the very simple provisions that ex-
isted in the Crown Land Ordinance were quite in-
sufficient to deal with the subject of water in
the Colony at that time. But, nevertheless, due
to difficulties and slumps and one thing and an-
other the 1929 ordinance was not in fact brought
into operation until 1935, by which date it was
already out of date."

There is strong evidence to suggest that A. D. Lewis, the
Director of Irrigation of the Union of South Africa, and A. E. Tetley, Esquire, the hydrographic surveyor of the Public Works Department, were the chief contributors to the 1929 ordinance and 1935 rules respectively. While there is little direct evidence of incorporation of specific provisions from other countries, it is quite clear that at this point in the development of the water law, foreign sources were seriously considered. An analysis of the statute and a comparison with possible sources from South Africa or Southern Rhodesia shows little, if anything, was actually borrowed for the ordinance, however. Tetley appears to have referred extensively to rules and provisions from Victoria, Alberta, British Columbia, Saskatchewan, Manitoba, and from the Canada Department of Interior from Canada, and Wyoming and Oregon from the United States but, here again, there is nothing in the rules themselves to support an argument in favor of direct borrowing of principles, concepts or rules.

The 1929 ordinance was so long in being implemented that occasionally groups of landowners banded together and developed their
own agreements relative to water and property rights. One such agreement, involving landowners on the littoral of Lake Naivasha, was executed in 1932 and provided, inter alia, the following:

WE, the undersigned being registered severally as the Proprietors and/or owners in fee simple and/or Lessees and/or assigns in possession of all those pieces or parcels of land riparian to Lake Naivasha in the Colony of Kenya.

IN CONSIDERATION of His Majesty King George V

(a) Undertaking and covenanted with use jointly and severally in perpetuity
Firstly that he His Majesty his heirs and successors will not at any time whatsoever take, institute, commerce, or prosecute against us or any of us any action suit or other proceedings whatsoever in respect of the occupation, use and cultivation by us or any of us of ALL THAT and those the lands uncovered from time to time and at all and any times by the recession of the waters of the Lake and lying
between our present Lake shore bound-
aries and the line of the water's edge at any time whether the same be in contravention of the provisions of Section 144 of the Crown Lands Ordi-
nance (Chapter 140 of the Revised Edition of the Laws of Kenya) or any other laws for the time being in force or otherwise save and except such por-
tions of the said lands as are at the date hereof reserved for public pur-
poses and subject to the right of His Majesty to declare any area which may in future be required for public pur-
poses to be exempted from the terms thereof. And Secondly that he His Majesty his heirs and successors shall never alienate the said lands in any manner whatsoever.

DO HEREBY jointly and severally for ourselves and each of us our heirs executors administrators and assigns and each of them and to the intent and so as to bind not only ourselves personally and each of us but also (so far as applicable) all and any persons claiming title under us or any of
us to our said riparian lands and any portions thereof covenant with His Majesty and hold him harmless and free from all or any actions and claims which may be brought against him by any one of us (our respective heirs, executors administrators and assigns) in respect of any loss caused by us or any of us by the rising of the waters of the Lake over the said lands or any portion of them also in respect to the division between ourselves of the lands the subject of the aforesaid undertakings and covenants.

The agreement was apparently entered into with the cooperation (or perhaps at the instigation) of the government itself. In addition to unilaterally declaring that all land exposed or added to the levels of the participants as waters of the lake receded was theirs in full title, notwithstanding the apparent rule of the Colony at that time that all land (whether under water or not) was the Crown's unless it had been specifically and properly alienated, the agreement bound the parties to arbitrate among themselves any dispute associated with access to the waters of the lake.
The English common law rule at that time was well settled to the effect that any change in the location of the water line on lakes due to accretion or reliction was reflected in increases or decreases respectively in the size of the holdings of the riparian owners. As the position taken in the agreement appears to assume the common law was not in effect, it seems clear that at least a considerable number of the landowners saw the Crown Lands Ordinance of 1915 as effecting a major change which was at least arguably to be perpetrated under the then recently enacted but not yet implemented 1929 ordinance.

In 1951 the most sweeping changes were made in the water law and the present ordinance was enacted. While this statute has been amended several times (1964, 1965) and had some major revisions made in 1962, the form and content today does not radically depart from the 1951 version. When the bill was being discussed efforts were made to suggest that very little new was to be incorporated into the water law of Kenya. A member of the Agricultural and Natural Resources Ministry made the following statement at the time of the second reading of the
... in drafting this bill, the Southern Rhodesian Act, the Scottish Act, the English Act and previous Kenyan legislation have been carefully consulted and furthermore a good deal of information has been gleaned from ordinances and acts in Australia, South Africa and elsewhere. So there is nothing new in this Ordinance that is entirely peculiar to Kenya (emphasis added).

While this statement suggests borrowing, especially in view of very substantial changes from the 1935 law, a comparison of the acts mentioned with the 1951 law suggests reference rather than incorporation. From whatever the source, a number of things found in the 1951 law had no equivalent in the 1935 legislation; others were merely changed, streamlined, simplified or refined. The Water Board, for example, was changed to the Water Apportionment Board. Local water authorities were new. A Water Appeal Board was provided, the country was divided into drainage districts, and District Water Boards, became Regional Water Boards. Also new were the water under-
An extensive examination of the substantive content of the statute is undertaken infra 55.

If one is tempted, as vogue frequently demands, to pin a label on Kenya Water Law on the basis of its historical development as either being a riparian jurisdiction or a prior appropriation jurisdiction it should be clear at this point that it really fits neither and has lost the hallmarks of both. Conditions have required principles of both but the original heritage from English common law has proven unworkable.

Tanzania

Tanzania, properly speaking, includes the Mainland, known as the Republic of Tanganyika and the island of Zanzibar. Here, however, we use the term Tanzania to refer to the Mainland, and are primarily concerned with the water laws of that part of the United Republic of Tanzania.

Zanzibar apparently regulates water allocation under Chapter 100, Part VII of her Legal Code under the provision relating to towns and
urban water supplies. There appears to be no formally adopted water code and principles of water law most likely are to be found, if at all, in the body of religious law. As of 1972 no applications for water permits had been received in Dar es Salaam under the laws of the Mainland and indeed it appears that even though the two are formally a part of the same political union, as far as water law is concerned, they are autonomous.

Because of the relative dearth of material available in Zanzibar, attention here will be focused on the water laws of mainland Tanganyika.

Because of the German colonial heritage, the drought configurations of most of the country, and the historical absence of a large European population, water law development does not share much in common with Uganda or Kenya. There were no Crown Lands ordinances to begin with, and when the British finally got around to promulgating any laws to regulate water use, they did so before adequate hydrologic groundwork had been laid. And because adequate factual input generally has
lagged behind legal development, several very dissimilar approaches were attempted before the present scheme was adopted.

Tanzania (Tanganyika), unlike Kenya and Uganda, was administered for a time by the Germans, but the German administration had no water ordinance and appears not to have committed itself at all one way or the other with respect to water rights. In all contracts relating to the lease and purchase of government lands, the determination of private water rights appears to have been left until the promulgation of a water ordinance. At the time the British took over the duties of administration, an ordinance had been drafted by the German government which distinguished between public and private ownership of all streams, water holes and springs and gave attention to usufructuary rights of landowners in privately-owned waters, fiscal prerogatives of expropriation, etc.

This proposed ordinance was never promulgated but there is some evidence that at least on the provincial level some regulation was actually attempted.
In the official Gazette for the Moshi District, the Amtlicher Anzeiger, reference is made on January 2, 1914 to a projected introduction of a 'water book' in which were to be recorded a list of furrows (ditches) together with plans and all particulars associated therewith with the suggestion that only recorded furrows would be recognized after the book had been completed. Registration was to take place in 1934 by which time German East Africa was administered by the British. It is important to note that the proposed registration applied only to 'planters' and no mention was made of native African furrows.

Control under the British administration was initiated under Ordinance 4 of 1923, incorporated in the 1946 edition of the laws as Cap. 130, and generally referred to by that designation.

The 1923 Ordinance, Cap. 130, is, at best, little more than an enabling law to allow district commissioners as presidents of local water boards to issue rights and permits to local residents to make use of the water. The provisions of the law were generally not
broad enough to allow any real governmental control over the water resources of the country.

Under Cap. 130, District Water Boards were organized under Provincial Water Boards and for a time under Territorial Water Boards. The Boards were usually set up with a strong and useful non-government element but African interests were almost invariably represented by the District Commissioner (who was also the President of the Board).

There was no statutory requirement that the boards meet regularly and as a practical matter meetings were held when an application for water use was submitted.

The powers given the board to make orders relative to the use of water were very broad. Clause 3 read in part as follows:

3. (1) A water board may, as respects the area within the jurisdiction, make orders--

(a) Prohibiting, restricting, or regulating the diversion, taking, storage, pollution, distribution, and use of water
from any natural water supply, whether on public land or private land, and the distribution of any available water among persons, whether legally entitled thereto or not, according to their requirements and in such manner as the Board in each case thinks just;

(b) Prohibiting, restricting, or regulating the construction, maintenance, and use of irrigation works of every description or works of any description in connection with the diversion, storage, pollution, use or distribution of water, whether on private or public land;

(c) Empowering any person to construct, maintain, and use irrigation works or any such works as aforesaid on his own land or on public land, or on the land of another person subject to the payment of compensation for any damage done thereby and on such conditions as to payment of rent or otherwise as the Board thinks just;

(d) Empowering any person to use irrigation works or any such works as aforesaid in common with the owner subject to payment
of such contribution towards the cost of construction and maintenance and on such terms and conditions as the board may think just;

(e) Requiring licenses to be obtained from the board for anything which by this Ordinance a board is empowered to prohibit, restrict, or regulate, or to empower any person to do;

(f) As to any other matter or thing, whether similar to those before enumerated or not, in connection with the supply, conservation, distribution, and use of water. 69

However, notwithstanding that broad power, no provision was made for executives to implement or maintain the orders. 70 The closest the statute came is found in language in clause 3(2).

3.(2) An order under this section shall be binding on all persons on whom it is served, or in the case of natives, to whom the substance is communicated verbally or in writing.

Provided that any such person may at any time within one month after receiving notice of the order
appeal to the High Court. 71

This, of course, did not prevent orders from being issued and
records reflect orders prohibiting or regulating the taking of
water except under license from the board by the Moshi, Arusha,
Mbeya and Kilosa Boards 72 and at least one order to control pollution. 73

The orders, licenses or permits were not limited in duration by
the statute and unless otherwise provided in the order, could be re-
voked at any time by the Board without compensation. 74

Finally, no provision was made for the acceptance of prescrip-
tive rights of Africans. In fact, however, some boards did take
notice of African users and issued grants to Africans. 75

It was the position of the government that any grant made by
the water board was not a water right in perpetuity but a permit to
an individual, personal to him and not transferable with the property. 76

The inherent weaknesses of the Water Board-type administration
generated pressures for reform. This time, however, changes were
made after several important hydrologic studies had been undertaken.
In 1928 Mr. Clement Gillman, then chief engineer of the Tanganyika Railways, began to call the government's attention to the almost complete lack of any knowledge of Tanganyika's hydrology. His interest was shared by Sir Edmund Teal, then chief hydrologist of Tanganyika, and led to the submission of the Gillman-Teal report on water control and investigations.

Shortly thereafter a consulting engineer from South Africa and a recognized authority in the field of hydraulics was engaged to advise on the drafting of a new water law. His report, Control of the National Waters of Tanganyika, further substantiated the Gillman-Teal report on the dearth of hydrologic data and, as a result, a new section of the Public Works Department, the Water Executive, was formed in 1938.

In 1940 Mr. Gillman, after his retirement as engineer for the railways, was appointed special water consultant to the government and his report, No. 6 of 1940, was the basis for the subsequent Water Development Department.
The result of these investigations ultimately was that a new ordinance was drafted on the lines of legislation already in force in India and Southern Rhodesia and was passed by the legislative council in 1948.

Although as early as the 1930's the 1923 Ordinance was seen as unsatisfactory, consideration of a replacement was delayed until 1944 by the pressures of the War. Even so, enactment in 1948 did not mean effective implementation. Regulations under the act were not approved by the governor-in-council until 1950 but difficulties in the selection of the personnel necessary for the proposed water courts were not overcome easily and it was not until September, 1954 that the new ordinance, Cap.257, was brought into operation and the 1923 legislation was repealed.

Basically, the 1954 legislation provided for a system of administration by water courts based on those of Southern Rhodesia and the Union of South Africa. It was brought into force in September 30, 1954 with a single water court exercising jurisdiction throughout the
country but after about a year the court was replaced by a system of district water courts. It must be noted that although Mr. Kanthack was from South Africa, the system of administration by water courts was adopted over his objection as being unsuitable for Tanzania due to the fact it was developed for the riparian systems of South Africa and Southern Rhodesia and could only be effective when there was a strong doctrine of private water.

After one year of operation with the single water court it had made decisions on less than 70 applications, heard one dispute (which took some 23 days), and gave preliminary consideration to 186 applications, 10 of which were ready for hearing, 30 awaiting final reports, 94 ready for advertisement and the remainder requiring further information. It has been estimated that an additional 723 applications were in the course of preparation. By way of comparison, during the first nine months of that same year, the Kenya Water Apportionments Board had completed hearings on 540 applications.

Section 8 of the act made application of the provisions of the
law conditional upon "information obtained by means of hydologic survey and other investigations" sufficient to satisfy the Governor in Council that control over the water resources of the area is justified. Once that was accomplished, the following provisions automatically took effect within the area:

8. (a) Every right, title and interest to or in water (other than the rights specified in sections 3 and 6 of this Ordinance) which was acquired prior to the commencement of such order, including any such right acquired by way of grant from the former German Government, shall expire on a date to be specified in the order (in this section referred to as the "specified date").

(b) On and after the specified date no person shall divert, obstruct, abstract or use water except in conformity with a water right or water permit issued under this Ordinance.

(c) Any person whose right, title or interest to or in water will expire, or has already expired, on the specified date by virtue
of the provisions of paragraph (a) of this section shall, provided that he makes application therefor in such manner and within such time as may be prescribed, be entitled to a water right or water permit on such terms and conditions as the water court may, in the exercise of its power under this Ordinance, determine.

(d) A water right shall not be granted except
(i) to the holder of a right, title or interest to or in land; and
(ii) where in the opinion of the water court the right to water may properly be made appurtenant to such holding.

In all other areas, the rights acquired under the old Ordinance apparently remained valid. And even when covered by the new legislation, no permit was needed at all for the abstraction and use of water for domestic purposes provided the water was found in its natural channel or bed at a place where access could
be lawfully had and provided the abstraction did not require the construc-
tion of any work. 94

No court, other than a water court, was given jurisdiction to hear in the first instance the disputes or claims and the courts were given broad order-making, investigatory and award-granting powers. 95 Appeal could be taken to the High Court 96 or an issue could be referred to that court by the water court for advisory opinion on the water court's own initiative. 97

In all cases before the court, certain principles were to be observed. In the case of competing applications for the same water, priority was to be given to the first application lodged. 99 Economic aspects of proposed schemes, works or undertakings were to be considered as well as the nature and extent of all land irrigable by the water requested (apparently whether or not the application was for a diversion for irrigation, suggesting some priority to be given to highest and best uses—which in Tanzania, given the arid condi-
tions and the dependency upon artificial watering of crops appears
Fundamental defects in the Water Court system soon suggested themselves. For example, the courts had jurisdiction only within the boundaries of designated administrative districts and could take into consideration only water use within that district. Since river systems and lakes did not always honor the artificial boundaries of the districts, water use in one area often affected supplies in another yet beyond the authority of the water courts.

Although the system finally came into full force September 30, 1954, by November, 1955, barely a year later, it was receiving critical departmental study. A motion was made in the Council urging the appointment of a Select Committee of the House to examine the procedure of the Courts. Although this motion was eventually withdrawn, an ad hoc committee was appointed by the Governor-in-Council early in 1956,

... to examine the provisions and administration of the Water Ordinance with particular
reference to the effective security of water grants: to consider what steps are necessary and practicable to ensure adequate control of the extraction and use of water: to advise whether any amendments to the Ordinance are necessary and to make recommendations. 104

The recommendations of this Committee were accepted by the Governor-in-Council as the basis for the preparation of new legislation dealing with water use and control. 105 A bill was drafted and presented to the Council in February, 1958. Several reasons account for the delay. Some members of the Council requested more time to study the proposal in depth. 106 Others, particularly African members, could not accept some of the principles upon which it was based and which had in fact been recommended by the Kingdom Committee. 107

The principal issue of substance was the difficulty many had with the idea in the proposed legislation of limited duration of water rights with consequent periodic renewals--particularly of those existing rights that were traditionally regarded by holders as permanent. 108 This, apparently, coupled with the requirements that
an application was necessary in order to register existing rights, gave rise to considerable doubts as to the real security of the present water rights and resulted in a number of amendments to the bill before it was considered by the Council. The bill was finally enacted in 1959 and has continued until the present time as the water code for the Mainland.
CHAPTER V

Kenyan Water Law Today

Nature of the Water Right

Water rights in Kenya are presently governed by provisions of the Water Ordinance, enacted in 1952. Under that legislation, as originally enacted, the water of every body of water was vested in the Crown and the control of such bodies of water was vested in the Minister on behalf of the Crown. Amendments since independence have deleted references to the Crown and have revised in its entirety the provisions referring to national ownership of water bodies. As a result, "the control of every body of water shall be exercised by the Minister, without regard to any status dependent upon ownership." Even so, the amendments do not appear to have destroyed the earlier established concepts of national ownership of water. This conclusion still is clearly supported in the statute and the exceptions are clearly noted. Among surface bodies of water, the act implies the principles of national ownership only to waters flowing continuously
or intermittently in natural surface channels or depressions, and to
waters flowing into or through lakes, ponds, swamps, and marshes.\textsuperscript{6}

Excluded are waters in springs situated wholly within the boundaries
of the land owned by one landowner and which do not naturally dis-
charge into a watercourse extending beyond the boundaries of such
land.\textsuperscript{7}

This scheme of division is repeated elsewhere and applies
whenever reference is made in the act to a "body of water."\textsuperscript{8} Thus,
in terms of national ownership, all groundwater, all water contained
in a flowing stream, spring, natural lake or swamp, or in or beneath
a watercourse, or in a zone of saturation, including waters abstracted
or diverted therefrom or stored therein except water in a spring
which is wholly on the property of a single landowner and which does
not discharge naturally into a watercourse that extends beyond the
boundaries of such land or forms the boundaries of such land is with-
in the full control of the state.\textsuperscript{9} Such a concept goes well beyond
that found in "riparian" jurisdictions that also trace their origins
to the English common law. Typically, in these other jurisdictions
the extent of the state right in the water depends on such factors
as whether there is any tidal movement in the waters or whether
the waters are navigable or useful in commercial activity; there
also, disputes between users tend to be resolved on the basis of
some standard of reasonable or beneficial use. The Kenya provisions
are also broader in several respects than that found in "prior-
appropriation" jurisdictions.

... the so-called "California doctrine," a hybrid
situation where the right of the state in the water
gives way to certain riparian rights in certain situa-
tions or to appropriative rights acquired in others.
It is not entirely similar in concept, to the appro-
priation jurisdictions following the so-called
"Colorado doctrine" in which a state control or
"ownership" theory of water rights is a central fea-
ture and all riparian rights are rejected as a gen-
eral rule.

These jurisdictions, unlike Kenya, tend to apply the principles of
state ownership only to surface waters or to limited categories of
subsurface waters such as underground streams, or the underflow of surface streams. Also in these jurisdictions, unlike Kenya, disputes between users tend to be resolved on the basis of priority of time in the acquisition of the basic right. Although Kenya begins with the fundamental precept of state ownership, thereby evidencing some similarity to certain of the appropriative systems, much associated with the typical appropriative scheme and certain aspects of conflict resolution are not found at all in Kenya legislation. It is clear in Kenya the water right includes only a right to the use of uses. The Ordinance declares that

... the right to the use of every body of water is hereby declared to be vested in the Minister, and, except in accordance with any such right, no person shall divert, abstract, obstruct or use water from a body of water otherwise than this Ordinance.

Further, no conveyance, lease or other instrument can effectively convey or otherwise grant or vest in any person "any property or right or any interest or privilege in respect of any body of water"
Acquisition of the Water Right

A. The Permit

Although a formal distinction is made in the Ordinance between surface and groundwater, there appears to be no difference as to the basic nature of the water right and a permit is required to facilitate the use of either. The right of use in surface waters can be acquired by permit and is necessary if certain uses of water are undertaken. The Ordinance provides that permits may be acquired for the following purposes: domestic purposes (defined as the provision of water for household and sanitary purposes, and for watering and dipping of stock); public purposes (defined as the provision of water for municipalities, townships, villages and communities, and for all "reasonable demands" for steam-raising on railroads or for other purposes connected with public undertakings but excluding the use of water for power generation); minor irrigation purposes (by which is meant for irrigation schemes of less than two acres, involv-
ing orchards, gardens, nurseries or land farming operations);\textsuperscript{21}
industrial purposes (meaning the "essential requirements" of any
industry, including mining);\textsuperscript{22} power purposes;\textsuperscript{23} general irrigation
purposes (for land exceeding two acres),\textsuperscript{24} and for any other purpose
approved by the Water Apportionment Board.\textsuperscript{25}

Permits are not required if the water is abstracted or used for
domestic purposes by a person having lawful access to the body of
water involved provided the abstraction is made without the necessity
of works.\textsuperscript{26} Such a situation would appear to cover any domestic use
made by riparians so long as works were not required or any uses
made of a body of water exempted from the coverage of the Ordinance,
as, for example, water of a spring entirely contained within the
boundaries of the user's property.\textsuperscript{27} Such a provision appears to
suggest some vestiges of the old English common law still present
although the Ordinance appears clearly to reject a riparian regime.
It could also perhaps be construed as extending to other forms of
legal access to the body of water--through lease or easement. In
either situation, however, the determining factor appears to be the lack of abstraction "works." Works are defined as "any structure, apparatus, contrivance, device or thing for carrying, conducting, providing or utilizing water, excepting hand utensils or other such contrivances as may be specified by the Water Apportionment Board."

Other situations in which use may be made of the water without the prior necessity of a permit include abstraction by means of works designed to develop groundwater provided such works are not within one hundred yards of any body of surface water, are not within a half mile of another well and are not within a properly declared conservation area. Also exempted from the permit requirement is the storage of water in or the abstraction of water from a dam constructed in any channel or depression that has been declared by the Water Apportionment Board not to be a watercourse.

When permits for surface waters are required, authority can be granted for the use thereof, which use can be limited as to the amount of water to be used, the nature of the use, or the length of
time for which the use may be made. As of July 17, 1972, there were 14,978 permits on record for the use of surface water.

Although the ownership interest of the state has been extended to all groundwaters by the Ordinance, the state has apparently not elected to exercise its full range of authority and permits are apparently not required at present for all groundwater abstractions. The present Ordinance in this context provides only that "no person shall construct or begin to construct a well without having first given to the Water Apportionment Board notice of his intention to do so, and shall notify the Water Apportionment Board when construction commences."  

While the above provision appears to apply to the construction of any and all wells, wherever situated, not all well drilling activity requires written approval from the Water Apportionment Board prior to commencement of construction. A permit in the nature of written authorization is required only if the well is to be drilled within one hundred yards of any body of surface water or
within one half mile of another well. 34

As with the right of use in surface waters, the right granted with respect to groundwaters may be restricted as to amount 35 and as to use to which the water is put. 36 As of July 17, 1972, there were 2,622 permits on record for groundwater extraction. As with surface water, non use during the permit period can result in the loss of the right.

While many of the provisions relative to groundwater have consumptive use overtones, others are designed to regulate in detail the mechanics of the well-drilling operation and to insure that an inventory of wells is produced that will facilitate effective resource allocation planning. 37

In the case of surface water, the permit is deemed to be appurtenant to the land for which it was issued. 38 However, in the case of groundwater, a person not the occupier of the land may, in certain circumstances, drill for water on land not his own. In such a case, the person constructing the well and the occupier of the land
share jointly the responsibilities associated with the drilling opera-
tion and failure to comply with the conditions implicit in the per-
mit can result in liability on the part of the occupier of the land
even though he technically has nothing to do with the drilling opera-
tion beyond owning the land on which the well is drilled.  

The Ordinance sets out no use classification relating to prior-
ities to be observed in water shortage situations in which uses of 
surface water need to be curtailed. The Ordinance does grant the 
Water Apportionment Board rather extensive powers to vary the amount 
of water to be used which may be invoked in shortage or drought situ-
atations. When invoked, the Board is empowered to  

... revise or vary any authorization, license, 
sanction or permit, and alter the discharge or 
quantity of water which any operator is author-
ized to divert, abstract, store or use, or alter 
the method or point of diversion or abstraction 
of water. 

Such power can be exercised whenever drought, natural changes, in-
creased demand or a diversion, abstraction, storage or use of water
causes "inequity or a shortage of water for domestic purposes or any other purpose which in the opinion of the Water Apportionment Board should have priority." 42

While this power appears to be sufficiently broad to enable the Board to establish a priority of uses similar to that found in typical prior-appropriation jurisdictions, such has not yet been undertaken and there is every indication that such will not be the case in the near future. 43 With respect to groundwater uses, however, specific statutory authorization clearly allows for the establishment of such priorities. In fact, the classification of uses need not at all be uniform nationally and may be developed on an area-by-area basis:

Priorities for the use of groundwater may be established separately in each area which constitutes, in the opinion of the Water Apportionment Board, a separate source of supply. 44

Special attention is also given in the Ordinance to the prob-
lem of waste. The Water Ordinance provides:

57. (1) No person shall, except with the written authority of the Water Apportionment Board-

(a) cause any ground water to run to waste from any well except for the purpose of testing the extent or quality of the supply or cleaning, sterilizing, examining or repairing such well;

(b) abstract from any well water in excess of his reasonable requirements and which he cannot use in a reasonable and beneficial manner;

(c) conduct the water from any well through any channel or conduit so that more than twenty per cent of the water is lost between the point of appropriation and the point of beneficial use:

Provided that, where the water from any well is conducted through channels or conduits together with water from other sources, no person shall permit the waste of more than twenty per cent thereof in conducting the water from the point of appropriation of the well to the point of beneficial use;
(d) use any water from any well for the purpose of domestic use or the watering of stock, except where such water is carried through pipes fitted with float valves or other satisfactory means of control, to prevent waste therefrom:

Provided that, where ground water interferes or threatens to interfere with the execution or operation of underground works, whether water works or not, the Water Apportionment Board may, in any particular case, agree that such water may be allowed to waste upon such conditions regarding quantity and method of disposal as it may specify.

In the semi-arid climate of Kenya, waste in the amount of twenty percent seems rather high but available technology in many areas would seem to be such that a smaller figure ought not reasonably be expected for a few years.

As suggested earlier, permits for the use of surface as well
as groundwater are classified by the nature of the use involved. This classification is not designed to serve any purpose relating to priority but does have a bearing on the duration of the permit. Permits may be secured for domestic purposes, public purposes, minor irrigation purposes (for land not exceeding two acres), industrial purposes, power purposes approved by the Water Management Board. Although there is separate legislation governing irrigation, the permits for the use of water involved are issued under the Water Ordinance. As a general rule, while the Ordinance is silent as to permit duration, the permits are not granted in perpetuity and the policy seems to be to grant permits for all purposes other than irrigation for not more than 25 years. Permits for irrigation are for only five years.

B. Permit Procedure

Applicants for permits are required by the Ordinance to submit certain documents in triplicate and pay a specified fee. These documents include (a) an application (together with such plan or
plans, drawn in such a manner and to such scale as will allow all requisite details to be legibly recorded; and (b) an application, where necessary, for the right to construct work across roads, railways, road reserves or railway reserves. The content of the application is specified by the Water Apportionment Board and appropriate forms are provided. For permits for the use of surface water, four separate types of information are required (see sample permit application, appendix A): information identifying the user and the body of water from which water is to be taken; information classifying the use as to its nature and the purpose involved (whether domestic, public, minor irrigation, etc.); quantity of water sought and pollution control provisions; information describing in detail the method by which diversion is to be accomplished; and finally miscellaneous information concerning collateral effects of the project such as information concerning other landowners affected, licenses, sanctions or permits already obtained for the land involved, the estimated time for works construction, estimated time after com-
pletion when all water applied for will be beneficially used, maps, proposed period for permit duration, etc.

Permits for groundwater use require, in addition to information identifying the applicant, his land, and the nature of the use, information regarding alternative sources of water available to the applicant, a listing of existing boreholes or wells within one half mile of the proposed site, and information describing in detail (size, depth, pumping rates, etc.) of the existing wells.51

Depending upon the nature of other activities involved in the abstraction, other applications as well may be required of the applicant: applications of easements of aqueduct, of work, or of storage;52 applications for water permits for the Drainage and Reclamation of a Swamp;53 applications to construct works across a road, railway, road reserve, or railway reserve.54

The applications are to be kept available for inspection by the public at all times55 and may be amended by the Water Apportionment Board at any time, whether or not objections as to their content
have been received. Such a provision, while far reaching, further emphasizes the state ownership role in water resources development in Kenya and is consistent with a system in which there are few private water rights to be derived from any fact of property ownership.

Applications are to be granted or denied on the basis of the merits of the individual application but as a general proposition in the case where several applicants are competing for a limited quantity of water, applications for domestic purposes are supposed to receive consideration over any other purpose. With respect to domestic use the Water Apportionment Board is empowered by ordinance to reserve such part of the flow of a body of water for domestic purposes if such is required in the opinion of the Board. As a matter of fact, however, priority seems to be accorded national projects with private projects (including non-governmental public uses) determined on a first-come, first-served basis with lowest priority given industrial projects. The power to reserve water for domestic uses has apparently been little used.
The decision to grant the permit application apparently may be made without any requirement of a public hearing but, in such a case, the approval is conditional only. Should the Board determine that the proposed permit is in the public interest, or not adverse to it, such conditional approval may be granted. If such is not the case, the application may be denied. Permits have been denied in the past on a variety of bases, including a lack of water resources, a failure to include proper pollution controls, and a conflict of interests between the applicant and the state—occasionally for reasons that can only be classified as political.

The actual decision as to how much water is to be allowed the applicant appears to be made not by the Board itself but by a Water Bailiff acting under the direction of the Board. The water bailiffs are a rather unique creation of the law designed originally to serve "Whenever it appears to the Water Apportionment Board that the water of any body of water is not being divided in accordance with the rights of operators or any other persons entitled thereto, or
is not likely to be so divided ... But according to the water (general) rules, the bailiffs have been given the power and it is their duty "to divide and regulate the water of bodies of water" so that those entitled get the amount set aside for them. As of the summer of 1972 there were 17 such bailiffs, although there was some thought given in the Water Development Department to increasing the number to 41 to correspond with the number of water districts.

The applicant, and any who have objected to the application, are to be given notice of the decision of the Water Apportionment Board and, in the event of rejection of the application, the reasons for the rejection set forth in detail. If such persons are aggrieved by the decision (including approval of the permit) appeal can be taken from the Water Apportionment Board to the Water Resources Authority. In such a case, the party taking the appeal has thirty days after the notification by the Board to lodge with the chairman of the Board a notice of appeal. Any decision by the Water Resources Authority, however, is final and binding on all parties.
concerned. Such a provision is a bit alien to a system based as it is on the English common law where one would expect some sort of recourse to the courts. Such a provision, however, goes far to explain the singular lack of litigation over water permits since the adoption of the Ordinance.

After conditional approval of the application, or before if the chairman of the Board deems it desirable, the chairman must prepare a notice identifying the applicant, the source of supply, the location of the proposed use, and a statement that objection to the proposed application must be received by the Board within thirty days of the date of the first publication of the notice. This notice is sent to the applicant who, if he still desires to acquire a permit, will cause the notice to be published in a newspaper specified by the Board having circulation in the locality in which the proposed work would be situated, and in addition, in one issue of the official Gazette. If the Board feels it to be in the public interest, such publication can be demanded in a second newspaper as well. The
Ordinance is silent as to the frequency of publication in the first newspaper but if such publication is required in an additional paper it is to be not more frequently than on four occasions within thirty days and it would seem unlikely that the primary publication would be for any shorter period or of less frequency.

Objections to the applications must be filed with the Board within thirty days of the date of the first publication of notice and must contain the specific grounds for objection. A copy of the objection is to be served on the applicant by the objector.

The Board may receive and consider the objections without the necessity of a public hearing but may order such a hearing if the objections prima facie warrant such a hearing. The decision to hold a public hearing appears to be left entirely to the discretion of the Board and is perhaps a dangerously broad power to have vested in such a board. The safety factor at present that tends to prevent abuse is the political and geographical climate that forces the Board to consider at all times the necessity for careful allocation.
of scarce water resources, a situation that maximizes the ability of
the individual to effectively object to a proposed use. However, as
pressure toward industrialization grows it would seem that this con-
trol could be offset by the apparent economic gains to be derived by
a particular use of water. In such a case, it would be easier for
the Board to consider insignificant an otherwise valid objection
raised by a small individual to the permit application of a larger
user that promises a more lucrative return. In such a situation
there is the danger that even an otherwise preferable domestic use
would have to give way to a less desirable industrial or public use.

The hearings, if held, offer the Board the opportunity to fully
explore the proposed use, to gather additional information and to
call pertinent witnesses, and while such hearings would be expen-
sive, to be sure, they perhaps should be encouraged as a desirable
tool for resource allocation planning.

The Board is required to consider the objections raised by
affected parties and may determine on the basis of such considera-
tion whether the application is to be approved, refused, or approved in part only. If the application is refused, the Board must endorse its disapproval on each copy of the application as well as on any other necessary documents relating thereto, and shall state the reasons for the disapproval. The powers to disapprove are very general and broadly stated. A permit, under the Ordinance, may be disapproved when it is determined to be not in the public interest, or would unduly interfere either with the undertakings of other operations or with that of other users. Notice of the disapproval is to be sent to the applicant by returning to him one copy of each such disapproval document.
Nature and Acquisition of the Right

Water rights in Tanzania are governed by the provisions of a relatively modern water code which dates from 1959.\(^2\) The present legislation purports to confirm all existing rights acquired under previous laws or from the former German government or under nature laws and customs\(^3\) but requires notification be given the Water Registrar before such existing rights are to be given full validity.\(^4\) Little appears to have been done by way of making an accurate inventory of these previously existing rights and since the statute places the burden on the right holder to bring the existence of the right to the attention of the government within one year of the time specified,\(^5\) we may consider this category of rights as having little importance today in Tanzania.

Tanzania, like Kenya, has predicated its water law legislation on the concept of state ownership of the nation's water resources.
The Water Ordinance states simply "all water in the territory is vested in the President." "Water" is defined by the Ordinance to mean "all water flowing over the surface of the ground or contained in or flowing in or from a spring or stream or natural lake or swamp or in or beneath a watercourse and all water made available from subterranean sources by means of works, but does not include any tidal water, nor water which is used solely for the purpose of extracting minerals therefrom." Unlike Kenya, which excludes from government ownership the water from springs completely contained on the property of the user, Tanzania makes no such ownership exception. Like Kenya, on the other hand, Tanzania has statutorily indicated areas in which the state authorizes the use of water without more explicit permission in the nature of a permit. It is emphasized that these exceptional rights are rights to the use of the water only and do not involve rights of ownership and, most importantly, are statutorily created and are not incidents of ownership to be associated with any particular parcel of land. An example of such
a situation is the right to use water for domestic purposes:

Any person having lawful access to any water may abstract and use the same for domestic purposes:

Provided that nothing in this section shall be construed as authorizing the construction of any works.

"Lawful access" is not defined by the statute nor has it been defined by the courts but would appear to go beyond mere riparian location. In addition, even though groundwater is within the ownership domain of the state, permits are not required if the owner or occupier of the land sinks or enlarges a well on the land and extracts no more than five thousand gallons in any one day (provided the well is not within 250 yards of another well or 100 yards of surface water).

As in Kenya, the water right may be limited as to time or quantity or purpose or may contain any terms or conditions the Water Officer may judge necessary to include. Rights may even be granted subject to the construction of designated water works. All works
are to meet the approval of the Water Officer who may initially, or at any time thereafter, inspect them and order necessary corrections or repairs.  

The water right in Tanzania is in many respects very different from that of Kenya even though the two countries share much by way of legal heritage. In fact, some aspects of the right are not at all what one would expect to find in a system that has had even the limited English common law background Tanzania has had.

First, where official sanction is required in order to use the water, the statute expressly states that nothing in any such water right shall be deemed to imply any guarantee that the quantity of water mentioned therein is or will be available. As a matter of fact, even the grant of the right may contain no reference at all to quantity and if no quantity is specified, the Water Officer may at any time thereafter specify the quantity for which the right shall be valid and direct the Water Registrar to record the same in the register of water rights and so inform the holder of the right.
And even if as a result of this process a reduction in the amount to be used is accomplished, no compensation appears due for any taking of the water right.

Second, the water right may be either appurtenant to the land or not depending upon the declaration of the Water Officer. Such a declaration may be made either at the time of the grant or at any time thereafter and, again, no compensation for a taking of rights is due. There are no guidelines in the statute to determine when a right should be appurtenant or when it need not be. It would appear that the presumption is that the right is not appurtenant until it is so declared. The statute does concern itself with the process of transferring water rights to others but the language seems expressly limited to the situation in which the right has been declared to be appurtenant. In such a case, notice of the transfer must be given to the Water Officer but no approval of the transfer appears necessary.

Third, if at any time in the opinion of the Minister, in any
specified area, the volume of water for which rights of use have been
granted is insufficient to satisfy all such rights, he may direct the
Water Officer to review the situation, in which case the Water Officer
may revise the quantity of water allowed any right and may change the
terms and conditions of any right to the use of water in that area.

The stated principle to be followed in such a situation is that
if a beneficial use of the entire right has been maintained the right
is not to be cancelled outright or reduced except in proportion with
all other rights in the same area. Again, it is noteworthy that
no compensation is due even in a situation where the right may be
cancelled nor is any guidance given to determine what "beneficial
use of the whole right" means. Arguably, this section gives the
Water Officer potentially unfettered power to handle water shortage
conditions and indeed may not result in across-the-board reductions
of all rights.

Drought situations are handled in a slightly different manner
and appear not to be subject to the above stated principle of pro-
portioned reduction of all rights. If, in the opinion of the Water Officer, the supply of water from any source is insufficient or likely to become insufficient for the needs of the persons using it because of drought conditions, the Water Officer may, at any time or from time to time, suspend or vary any or all rights to abstract or use water from that source for such period of time as he deems necessary. In such a case, the rights "cease for the period of the suspension or shall be exercisable only as so varied ...". Again, little is contained in the statute to guide the Water Officer and, as a result, he appears to have great discretion in the exercise of this power. This is particularly significant given the arid nature of most of Tanzania where drought conditions are not unexpected or infrequent.

Fourth, water rights may be terminated or altered for nonuser or for failure to comply with any condition, express or implied, to which the water right is subject. Section 25(1) provides that

... if at any time the Water Officer has reason to believe that the holder of a water right has
not, during the preceding three years, made full
beneficial use of that right, the Water Officer
may by notice in writing addressed to such holder
call upon him to show cause why such right should
not be determined or diminished or modified in
such respects as may be specified in the notice.

The holder of the right has three months in which to respond and give
the holder an opportunity to be heard. If the Water Officer is
satisfied by the showing, he may order the right to continue un-
changed. Otherwise, he is authorized to terminate, diminish, or
modify the right.

In similar manner, failure to comply with a condition upon which
the right is predicated may result in termination or modification.
However, where the situation is such that the default is capable
of being remedied, the holder is to be given the opportunity to
remedy the same before further action is taken.

A couple of other aspects of the law warrant consideration.
First, much has been said already about the lack of protection
afforded the water rights as property rights for which compensation
is due when they are taken. Section 26 provides that where the
Water Officer is satisfied that the water is required for a public
purpose he may, by notice in writing addressed to the holder of any
water right, terminate or diminish that right to the extent the
water is required for the public purpose. In this case, the
holder is entitled to compensation for "all loss resulting from the
termination or diminution of the right." The amount of compen-
sation payable is to be determined by the High Court on application
of the holder or the Minister. The section further provides that
the Governor-in-Council of Ministers may by notice in the Gazette
declare any purpose to be a public purpose within the meaning of
this section. One would hope that this method of determining a
public purpose is not exclusive and that as a result compensation
would be due for the termination of a right to provide water for
a purpose otherwise public in nature but not so declared by the
Governor-in-Council. The singular lack of litigation in this
matter sheds no light on the subject whatsoever and leads one to
conclude there has been little, if any, abuse of this power.

Second, and somewhat related, is the power granted by the statute to a water right holder to, in effect, condemn an easement to facilitate full use of his water right. Section 28, in part, provides that

28. (1) Where any person who is the holder of a water right or who has applied for the grant of a water right is unable fully to enjoy the benefit of that right without an easement, and has failed to secure an easement by agreement with the owner or occupier of the land over which the easement is required, he may apply to the Water Officer for the creation of such easement.

(4) The Water Officer shall consider any objections made to him and shall give an opportunity of being heard to all persons who so require, and may thereafter by a certificate in the prescribed form create such easement as he may consider appropriate or refuse to create an easement.

The creation of the easement is subject to the duty to pay compensation. The section further provides

28. (6) Every easement created under this section
shall be subject to the payment of such compensation, either by way of a capital sum or of periodical payments, as the Water Officer may decide, to such persons as the Water Officer may consider to be injuriously affected by the creation of the easement and in such proportions as the Water Officer may decide and may be made conditional on the construction and maintenance of such bridges and other works as may in the opinion of the Water Officer be necessitated by the severance of the land subject to the easement.

(7) If the person enjoying the benefit of an easement fails to pay such compensation as directed or to construct such bridges and other works within such time as is therefor allowed by the Water Officer, or fails to maintain or repair such bridges or other works after being required so to do by the Water Officer, the Water Officer may by notice in writing addressed to that person determine the easement.

(8) Any compensation due under this section which remains unpaid may be sued for as a civil debt. 34

Finally, the Water Officer needs to be considered. From what has been said already, it is apparent that he has considerable power
in the administration of the water rights scheme. In addition to the rather broad powers granted by statute, they are specifically granted considerable immunity from personal liability. The Water Officer is appointed by the Minister for Natural Resources and is the person primarily responsible for the administration of the water allocation system of Tanzania. He serves together with a Water Registrar, who is also appointed by the Minister but it is the Water Officer who has the final authority and responsibility with respect to the granting of water rights. The country is divided into water regions and for each region a Water Advisory Board is appointed by the Minister. The Water Officer is bound by law to consider the appropriate Water Advisory Board before granting or refusing any application for water right before terminating, diminishing or modifying any existing water right, or before specifying the quantity of water involved in water rights. The Water Advisory Board has the further responsibility of advising the Water Officer as to the measures to be taken in case of drought and the
priorities to be given various uses from time to time. Such advice is to reflect local circumstances with respect to the different purposes for which water is required in the region. While the Water Officer is obliged to consider the advice of the Water Advisory Board, he is not bound to follow such advice and is exempted from even referring to such advice if the water right is modified or varied with the consent of the right holder or where the right is altered or suspended as a result of a determination by the Water Officer that drought conditions make, or are likely to make, water supplies insufficient for existing needs.

The Water Registrar is to keep a record of all granted water rights and is to be notified by the Water Officer of all grants or changes in existing grants.

In addition to the broad powers of the Water Officer in granting, terminating, or altering water rights, certain types of use are made subject to rather stiff conditions. Section 18 of the statute provides that certain conditions are to be implied automatically with
respect to any water right granted for mining, forestry or industrial purposes or for the generation of power. Those include-

18.(a) that the water used thereunder-

(i) shall be returned to the stream or body of water from which it was taken or to such other stream or body of water as may be authorized by the Water Officer;

(ii) shall be substantially undiminished in quantity;

(iii) shall not be polluted with any matter derived from such use to such extent as to be likely to cause injury either directly or indirectly to public health, to livestock or fish, to crops, orchards or gardens which are irrigated by such water or to any product in the processing of which such water is used;

(b) that precautions shall be taken to the satisfaction of the Water Officer to prevent accumulations in any river, stream or watercourse of silt, sand, gravel, stones, sawdust, refuse, sewerage, sisal waste or any other substance likely to affect injuriously the use of such water.
The enforcement of these conditions as well as any other imposed by the Water Officer is governed by other provisions of the statute. Section 34(4), for example, provides that anyone who pollutes the water of any river, stream or watercourse or any body of surface water to the extent it poses a threat directly or indirectly to public health, to livestock or fish, crops, orchards or gardens irrigated by the water, or causes injury to any product in the processing of which the water is used is subject to fine and/or imprisonment. Similar fines and imprisonment apply to unauthorized dams, diversions, abstractions, uses, excessive uses even though the holder of a valid permit, failure to comply with conditions imposed on uses and construction, willful damage and destruction of water works, unauthorized construction of water works, falsification of information to receive a water right, or failure to give required information. The possibility of enforcement of these provisions apparently was envisioned originally as a major legitimizing force behind the actions of the Water Officer but as a matter
of actual fact there is little evidence that these provisions are much used. Even so, the Water Officer is not entirely independent nor do all of the statutory provisions tip the scales heavily in his direction. He is subject to others in the government and to a certain degree to the judicial system. Any person who is aggrieved by the actions of either the Water Officer or the Water Registrar as a result of their action whatsoever whether it be in the recording of an existing right or in the refusal to grant the right itself may appeal to the Minister for Natural Resources for a review of the situation.

An Advisory Committee of five persons, at least three of whom are not public officers, shall assist the Minister in directing the appeal. It is perhaps curious to note that once the decision is reached by the Minister it is final and no recourse is provided beyond that point, and such a provision is not at all alien to the political and social milieu in which the water law system functions. It is not at all strange once one views the system as an administrative allocation system, not at all like the
traditional riparian or appropriative systems which are best described as judicial in nature. In the Tanzania system judicial inputs are deliberately held to a minimum with most interpretive and allocatory powers given to the administrative officers. The High Court may be involved occasionally but generally only as a step in the enforcement process either of statutory provisions or of the few scattered fragments of rights from the former British common law system. It appears that the experience Tanzania had with a water court system has caused the country to turn its back as much as possible on judicial meddling with water rights.