2.1 BURUNDI

Introduction

Burundi has an area of 27 835 km^2, a population (1983) of 4 920 000, and thus a mean population density of 176.7 persons/km^2. It is therefore among the most densely populated of all African countries. It stretches 232 km from north to south between latitudes 1°19' and 4°27'S, and 203 km from west to east between longitudes 29°00' and 30°51'E. It is bounded by Tanzania in the east, by Rwanda in the north and by Zaire and Lake Tanganyika in the west. It is situated in the highlands along the eastern arm of the Western Rift Valley, and only along the shores of Lake Tanganyika (773 m asp does the land surface fall below the 1000 m contour.

A mountain range, reaching 2670 m as1 (3°36'S/29°30'E), runs roughly N-S along the western boundary, providing the highest land in the country, and from its watershed western streams descend steeply to the Ruzizi River and Lake Tanganyika. On the eastern side of the watershed, streams flow north to the Akanyaru River, or south to the Malagarasi River, or they collect, in central districts, into the Luvironza/Ruvuvu River. This latter river is the most important in Burundi in as much as it has the largest drainage basin. The Malagarasi and Ruzizi Rivers discharge to Lake Tanganyika and hence their waters flow to the Zaire River and the Atlantic Ocean, while the Luvironza/Ruvuvu and Akanyaru Rivers are affluents of the Kagera River. They are thus remote headwater tributaries of the Nile and their waters flow to the Mediterranean Sea. The source of the Luvironza is deemed to be the source of the Nile farthest from the sea.

Vegetation

The higher parts of Burundi are covered by evergreen Afro-montane vegetation, with transitional evergreen rain forest on the western slopes of the mountains, overlooking the Ruzizi Plain and Lake Tanganyika. The lower parts of Burundi, in the east and southeast, support a mosaic of evergreen bushland interspersed with a wetter type of Acacia savanna.

Climate

The climate is determined by altitude and the influences of three major wind systems, the SW Monsoon, and the SE and NE Trade Winds. The trade winds are dry. The SE Trades blow up from the Indian Ocean but lose most of their moisture over the rising series of scarps and plateaux that comprise East Africa, and are quite desiccating by the time they reach Burundi. The SW Monsoon which blows from Zaire brings most of the rain, especially to the high, west facing slopes. It prevails over the country between November and April. The NE Trades are even drier than the SE Trades and are the dominant winds in the northern winter, tending to push back the SW Monsoon. Mean annual rainfall at Bujumbura (3°22'S/29°20'E), on Lake Tanganyika, is close to 960 mm. About 820 mm falls during the six months November-April, but sometimes there is a

short dry season in January if the NE Trade Winds become dominant. Very little rain falls in the May-October period, and June, July and August may be virtually rainless. Precipitation on the west facing mountain slopes reaches 1375 mm/yr, but is lower, c. 1100-1250 mm/yr, over the eastern plateaux. Rainfall may occasionally be irregular and droughts have been known.

Mean annual temperatures on the plateau are close to 21°C, with summer maxima in the region of 33°C. Below 2000 m, winter minima are about 6°C, but above this altitude winter minima are lower and frosts occur at the highest and most exposed points. The western facing mountain slopes are subject to higher cloud cover than the rest of the country, and in addition to being wetter, are also cooler than the eastern plateaux.

Wetlands

There are a number of small lakes in the mountains and four substantial lakes including Lake Tanganyika, about 8% of the surface of which is situated in Burundi. There are floodplains and permanent swamps along many of the rivers, especially in the headwater regions, and on the lower plateaux.

List of Wetlands Described

1. The Ruzizi Plain
2. Natural Lakes
    (a) Lake Tanganyika
    (b) Lake Tshohoha South
    (c) Lake Katshamirinda
    (d) Lake Rwihinda
    (e) Lake Rugwero
    (f) Lake Kanzigiri
3. Riverine Swamps & Floodplains
    (a) The Luvironza/Kayongozi/Ruvuvu System
    (b) The Akanyaru River
    (c) The Mugwezi & Luaba Rivers
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Wetland Name: The Ruzizi Plain
Country: Burundi
Coordinates: 2°32'-3°21'S/28°56'-29°35'E
Area: 181 000 ha (total lower plain - approximately 50% in Burundi)
Altitude: 773-810 m asl
Nearest Towns: Bujumbura (at S end); Gitega (62 km WSW)
General: The Ruzizi Plain occupies the floor of the Western Rift Valley at the northern end of Lake Tanganyika, and has been transgressed by lake water in the past. The lower plain slopes very gently southwards to the lake, and the Ruzizi River meanders across the centre of the plain, roughly from north to south, forming the national border with Zaire. On

either side of the plain the land rises steeply into the mountains. Precipitation over the lower plain is 800-900 mm/yr, while on the slopes of the valley it is 1200-1300 mm/yr. April is the wettest month with mean falls of 140-160 mm on the plain and 180-200 mm in the hills, depending upon site. The dry season usually begins in the second half of May and persists until the end of September, but is longer in the south than the north. Winds are generally light in the morning, increasing to peak velocities at midday, when they may attain 20 km/hr in the wet season and 28 km/hr in the dry season. Mean monthly temperatures range from 22.5-25°C, while mean monthly maxima and minima are 30.5-32.5°C and 14.5-17°C respectively. There are extensive wetlands on the plain, chiefly associated with the Ruzizi River and its tributaries.

Flora & Fauna: *Phragmites mauritianus* swamps accompany the Ruzizi River, in a belt up to 3 km wide, along the lower half of its 135 km course between Lake Kivu and its delta in Lake Tanganyika. The swamps are wider in the south than the north, and also occur on the tributaries, but in much narrower strips. It is estimated that there are, or were, at least 12 000 ha of reed swamps on the Ruzizi Plain in Burundi. Where inundation is permanent the reeds reach 4 m in height, but where it is seasonal they are little more than 2 m high. The most important associate species are *Ipomoea fragrans, Panicunz meyerianum, Paspalidium geminatum* and *Polygonum pulchrum,* the last three species being especially well represented where the surface waters are only superficial.

On the sides of lakes, on meander bends and around small islands in the river, one finds sandy beaches, subject to periodic inundation, but with groundwater always near the surface. These places are covered by a *Cyperus laevigatus-Pluchea bequaertii* association, 1.5-2 m high, with some *Pluchea dioscoridis* and *P. ovalis,* and a ground cover of *Cyperus laevigatus* and *Fimbristylis ferruginea* growing 35-125 cm high.

The country adjacent to the floodplain is covered by *Thenieda-Bulbine* grassland, but throughout this there are small ponds which provide water-holes for domestic cattle. They are flooded to depths of over 1 m in the rainy season but are transformed into quagmires during the dry season. They support *Oryza barthii,* with *Asteracantha longifolia* and *Burnatia enneandra* on the fringes, and sometimes central patches of *Nymphaea lotus* and *Utricularia thonningii.* From place to place the *ThenzedaBulbine* association is interrupted by swards of *Sporobolus spicatus* in periodically inundated depressions. These are heavily grazed by local cattle in the dry season. This is the most halophilic association on the valley floor, under which the soil water contains salts to a total concentration of 8%o. Elsewhere, in large shallow depressions in the *Themeda-Bulbine* savanna, where the gradient is virtually zero, water collects semi-permanently. The ground surface is always muddy, particularly where trampled by cattle, but surface water is seldom more than a few centimetres deep. These areas support a cover of *Panicum ruziziense,* with some *Ammania senegalensis, Cyperus platycaulis, Desmodium hirtum, Ilysanthes parviflora, Lindernia boutiqueana* and *Ophioglossum costatum.*

Another very local hydromorphic association in this large wide valley is that of *Setaria holstii* and *Bothriochloa insculpta.* This occupies depressions along the valley floor that were once the beds of lakes. They have clay floors and are inundated for most of the wet season, but dry completely during the dry season, when the clay hardens and cracks. Other species found here include *Digitaria scaettae, Glycine borianii* and *Paraknoxia ruziziensis,* together with vagrants from the surrounding savanna.

Where rivers traverse the metamorphic terrain at the feet of the mountains they flow in

very steep-sided valleys, and throughout these regions the narrow banks carry gallery forest dominated by *Baphia descampsii* 10-12 m high, with *Cissus araliodes, Craibia grandiflora* and *Sterculia tragacantha as* typical associates.
Amphibians are abundant and some reptiles are present, including *Dromophis lineatus, Limnophis bicolor* and *Philothamnus irregularis,* together with varanid lizards and occasional crocodiles. Among the birds of the flood plain and permanent herb swamps one encounters *Acrocephalus schoenobaenus, A. scirpaceus, Actitis hypoleucos, Calidris ferruginea, C. nzinuta, Chlidonias leucoptera, Cuculus canorus, Delicon urbica, Falco subbuteo, Glareola nordmanni, Hippolais pallida, Hirundo rustica, Motacilla feldegg, M. flava, Pandion haliaetus, Phylloscopus trochilus, Porzana porzana, Riparia riparia, Tringa glareola* and *T. nebularia.* Mammalian wildlife has been largely displaced by domestic cattle. Only the small mammals, discussed in the regional introduction are present.
Human Impact & Utilisation: The Ruzizi Valley is intensively cultivated, and the wet areas are frequented by domestic cattle in the dry season when large areas of wetland are burned. Reeds are used for thatching and other domestic crafts.
Conservation Status: Unprotected.

2. Natural Lakes

Wetland Name: Lake Tanganyika
Country: Burundi
Coordinates: 3°21'-8°51'S/29°04'-31°12'E
Area: 3 290 000 ha (c. 263 200 ha in Burundi)
Altitude: 773 m asl
Nearest Towns: Bujumbura (at N end); Gitega (63 km W)
General: Lake Tanganyika is 659 km long with a maximum width of 85 km at the parallel 5°55'S. It is slightly brackish and the second deepest lake in the world (1470 m). It lies in the western arm of the Great Rift Valley and down most of its western side the escarpment plunges straight into the water, and in the south basin, it continues underwater to the maximum depth of 1470 m, which is reached just 4 km offshore. Only at the northern end in Burundi, and at the southern end in Zambia is the underwater slope moderate, and even in these places the 100 m contour is reached inside 10 km. In Burundi the adjacent mountain ranges reach 2670 m in altitude, while on the opposite, Zairean shore they exceed 3000 m. At the northern end the lake is fed by the Ruzizi River and by 31 torrential streams which flow down from the surrounding mountains of Burundi. Other rivers, and countless small streams enter all round its central, southern and eastern margins in Zambia, Tanzania and Zaire. The Ruzizi River, draining Lake Kivu, descends the Panzi Falls before entering Lake Tanganyika so that the two lakes are faunally isolated. The Ruzizi has formed a substantial delta at the north end of Lake Tanganyika, half of which is in Burundi. The other principal affluent is the Malagarasi River, which drains much swampy land to the south of Lake Victoria, and most of SE Burundi.
The lake drains from the middle western section via the Lukuga River to the Lualaba, but water levels fluctuate over long time periods, much as they do in Lake Malawi to the south,

and these fluctuations are discussed by Camus (1965). The flora, fauna, hydrology, water chemistry and geological history of the lake proper are dealt with, in detail, in section 2.9 Tanzania. However, brief accounts of the fish fauna, and the lake and delta floras are given here.

Flora & Fauna: *Ceratophyllum demersunz* is abundant in the vicinities of affluent river mouths, while in the deltas of several rivers, *Azolla pinnata* forms immense floating mats, green or red-brown in colour, and there are great submerged beds of *Myriophyllunz spicatum, Najas marina, N. pectinata, Ottelia ulvifolia, Potamnogeton pectinatus* and *P. schweinfurthii. Potamnogeton* spp. are the predominant macrophytes around much of the shoreline, with occasional rafts of *Nymphaea caerulea* and *N. capensis* in shallow sheltered bays. *Cy perus papyrus, Phragmites mnauritianus* and *Typha domningensis* dominate the delta swamps, with *Vossia cuspidata* as the principal low growing associate. The lake contains a large fish fauna comprising some 193 species from 13 families, an analysis of which suggests that the lake is ancient and has been isolated for a long time. Although 98% of the cichlids and 57 % of the non-cichlid species are endemic, similar proportions to those found in the faunas of Lakes Malawi and Victoria, it is the degree of speciation here, which distinguishes Lake Tanganyika from the others. It contains no less than 8 endemic genera, and some endemic species reveal distinct subspecific forms between the north and south ends of the lake. In comparatively recent times Zaire Basin species have invaded the lake, presumably by way of the Lukuga River, the most recently established effluent. These include *Distichodus fasciatus, Hydrocynus goliath* and *Labeo lineatus.* Other interesting species include *Protopterus aethiopicus, Polypterus congicus* and *P. ornatipinnis,* which also occur in the Zaire Basin and, in the lake, inhabit lagoons and deltas, especially the Malagarasi Delta. These are ancient fish and their presence has probably been continuous from the time when the Malagarasi flowed directly into the Zaire Basin, before the faulting which led to the development of the Rift Valley and its lakes. There are two fully aquatic piscivorous snakes in the lake. *Boulengerimia annulata* lies up in the rocks during the day and fishes nocturnally, while *Glypholycus bicolor* hunts pelagic fish, chiefly shoals of *Stolothrissa tanganicae.*

Human Impact & Utilisation: The lake is fished intensively from Bujumbura.

Conservation Status: Unprotected.

Wetland Name: Lake Tshohoha South

Country: Burundi

Coordinates: 2°20'-2°32'S/29°59'-30°10'E

Area: c. 7000 ha (5000 ha in Burundi)

Altitude: c. 1750 m asl

Nearest Towns: Bujumbura (125 km SW); Gitega (100 km S)

General: Lake Tshohoha South (Lake Tshohoha North is in Rwanda) is 30 km long, oriented SE-NW, and is shallow with a highly indented perimeter. It reaches 5 km in width at the southeast, but is generally 1.5-2 km wide. It lies on the floor of a swampy forested basin between two low hill ridges. It is fed at the southeastern end and drains to the Akanyaru River from the northwestern end through 4 km of swamps. It is fringed by papyrus and *Miscanthidium* swamps, with patches of arborescent

swamp forest containing *Bridelia micrantha, Ficus verruculosa, Myrica kandtiana* and *Phoenix reclinata,* while the submerged vegetation and fauna are typical of Equatorial East African Plateau lakes as described in the regional introduction. The surrounding basin contains some seasonally inundated savanna dominated by *Acacia polyacantha* var. *campylacantha* and A. *sieberana.* The lake is fished, some agriculture occurs higher in the basin, but it is not protected.

Wetland Name: Lake Katshamirinda
Country: Burundi
Coordinates: 2°27 'S/30°01 'E
Area: 400 ha
Altitude: c. 1450 m asl
Nearest Towns: Muhinga (57 km SE); Kitega (105 km S)
General: This little lake is oriented SE-NW. It is 4 km long and about 1 km wide, and is situated southwest of Lake Tshohoha South, in an adjacent and parallel basin. The southeastern end is set in forested country, but the northwestern end merges into papyrus swamps, through which it drains for 4 km to the Akanyaru River. Its flora and fauna are similar to those described for Lake Tshohoha South and it is unprotected.

Wetland Name: Lake Rhwihinda
Country: Burundi
Coordinates: 2°32'-2°34'S/30°03'-30°06'E
Area: 9200 ha (1200 ha open water + 8000 ha swamps)
Altitude: c. 1480 m asl
Nearest Towns: Muhinga (42 km SE); Kitega (95 km SSW)
General: Like the two previous lakes, this shallow waterbody is also oriented SE-NW. It is 6 km long and 2.5 km wide at the southeastern end. It is flanked by an extensive belt of permanent swamps on its southwestern shore, and drains to the Akanyaru River from its northwestern end through a tract of swampland 11 km long and 2 km wide. The swamps are dominated by *Cyperus papyrus* and *Miscanthidiunzviolaceum* but with some *Phragmites mauritianus* and occasional *Dissotis incana. Phoenix reclinata* is common in substantial patches of low swamp forest dominated by *Ficus verruculosa* and *Myrica kandtiana.* The lake is unprotected. It is fished and there is some agriculture on the northeastern side.

Wetland Name: Lake Rugwero
Country: Burundi
Coordinates: 2°21'-2°28' S/30°16' -30°22 'E
Area: c. 6000 ha (open water, excluding swamps)
Altitude: c. 1750 m asl
Nearest Towns: Bujumbura (143 km SW); Muyinga (43 km S)
General: The surface area of this lake varies considerably from wet to dry years. It is 15 km long, and up to 8 km wide at the north end at maximum. The lake is shallow, c. 2-4 m,

and lies at the southern end of the Mugesera/Rugwero Lake/Swamp Complex, described in section 2.6.10. The northern part of the lake just intrudes into Rwanda. The southern and southwestern shores are forested, while the western, northern and northeastern shores abut extensive swamplands. The lake drains northeastwards, through a short swampy tract to the Nyawarungu River. Innumerable small circular or semi-circular papyrus islands float on the lake surface, and the shores are fringed by papyrus with *Vossia cuspidata* and other aquatic species along the outer faces. *Dryopteris gongylodes* forms an understorey in the papyrus, while to landward there are wide *Miscanthidium* swamps and occasional trees and *Phoenix reclinata* palms. The lake is fished, the hinterland is cultivated locally, and it is unprotected.

Wetland Name: Lake Kanzigiri
Country: Burundi
Coordinates: 2°26' -2°29' S/30°21 ' -30°23 'E
Area: 1600 ha (open water) + 3600 ha (swamps)
Altitude: c. 1490 m as1
Nearest Towns: Muhinga (38 km 5); Kitega (113 km SW)
General: Lake Kanzigiri is situated 10 km SE of Lake Rugwero. It is 8 km long and 2 km wide, and aligned SW-NE. It is fed through a 6x3 km tract of swampland at the southern end by the Kabanga and Runombe Rivers, and drains from its northern end through swamps to Lake Rugwero. However, along most of its western shores it is separated from Lake Rugwero by forested land. It is fished and some cultivation occurs around its margins. It is unprotected.

3. Riverine Swamps & Floodplains

General: The climate is marked by a long dry season, which in many years may be virtually rainless, followed by a 6 month wet season when 2000 mm may fall in the highlands, and up to 1200 mm on the plateaux. Thus highland rivers are torrential at this time, deeply eroding the land, while in the flatter valleys much alluvium is deposited and floodplains have developed. Some of the lower valleys are characterised by permanent and semi-permanent swamps.

(A) THE LUVIRONZA/KAYONGOZI/RUVUVU SYSTEM

General: The Luvironza rises at a point 3°44'S/29°47'E at an elevation close to 1950 m as1 on the high dorsale immediately east of Lake Tanganyika. It flows north over a boggy plateau, where *Sphagnum* sp. grows with *Drosera madagascariensis, Loudetia phragmitoides, Lycopodium carolinianum, Rhynchospora brownii, Utricularia appendiculata* and *Xyris angularis.* Such bogs are common above 1700 m, but may also occur at the heads of valleys down to 1500 m. The Luvironza eventually turns NE and decends below 1500 m into a deep valley, in which it receives several tributaries, including the Karuzi River on the left bank, and after this becomes known as the Ruvuvu. Another major tributary, the Kayongozi River, rises in the far east of Burundi, close to the Tanzanian border, and flows southwestwards, anti-parallel with the Ruvuvu for 48 km, before turning abruptly northwards to a confluence with the Ruvuvu at 3°15'S/30°19'E, just below

the 1500 m contour.

Extensive permanent swamps, dominated by papyrus, occur in the headwater basin of the Kayongozi (3°04'S/30°32'E-3°00'S/30°36'E) and its affluent the Mumizi (3°03'S/30°37'E). Many other deep high valleys above the Ruvuvu are blocked by *Cyperus papyrus* with, occasionally, some *Polygonum strigosum.* So dense are these swamps, and so variable the water levels, that agriculture is precluded, while the shallow valleys are largely given over to cultivation. These valleys tend to be flooded for half the year, but rather dry for the other half, and behind the papyrus along the thalwegs, they were once filled by swamp forests, dominated either by *Syzygium guineense* or *S. owariense.* The former is associated with *Ficus verruculosa* and *Myrica kandtiana* and occupies the drier sites. Little relict stands are still apparent, but the trees have mostly been cleared. *Syzygium owariense* forests occupy the wettest sites and the trees develop pneumatophores. They are associated with *Cyathea dregei, Lonchitis natalensis, Lygodium scandens, Osnzunda regalis, Pteris intricata* and *Renealmia engleri,* but this type of forest has also been intensively cleared, and where there is no cultivation there are now secondary swamps of *Cyperus latifolius.* There is little *Phragmites* in the high valleys, but in some relatively undisturbed wet situations one meets *Cyperus nudicaulis* and *Pycreus inundtii* fringing standing water which supports floating mats of *Azolla pinnata* and *Lemna paucicosta,* over submerged beds of *Enhydra fluctuans, Hydrocotyle ranunculoides, Lemna paucicosta* and *Ludwigia adscendens.*

Gallery forest in the upper Ruvuvu system is confined to the narrow and often rocky valleys of tributaries. It is inundated only for short periods when the rivers are in spate, and is locally dominated by *Newtonia buchananii,* with *Albizzia gumnzifera, Bridelia micrantha, Cleistanthus polystachyus, Harungana nzadagascariensis, Magnistipula bangweolensis, Millettia dura, Sapiunz ellipticunz* and *Xynzalos monospora.*

The Ruvuvu River meanders along its lower valley at altitudes of 1400-1100 m asl, accompanied by a narrow, tree covered floodplain, 3-5 km wide. On this there are many pools, and the dominant trees are savanna species such as *Acacia seyal.* The river itself is densely fringed by *Cyperus papyrus* and *Phoenix reclinata,* with gallery forest behind. The pools on the floodplain support typical submerged and floating leaved aquatics including *Ceratophyllum demersum, Leersia hexandra, Ludwigia adscendens, Nymphaea caerulea, Potamogeton* spp. and *Vossia cuspidata.*

Large animals are comparatively common in the lower valley and include *Crocodylus* niloticus, Hippopotamus anzphibius, Hippotragus equinus, Kobus ellipsiprymnus, Phacochoerus aethiopicus, Syncerus caffer, Tragelaphus scriptus and T spekei. There is an abundance of water birds including Mycteria ibis and Pelecanus onocrotalus. Some 46 000 ha of the lower valley including much wetland, is protected in the Ruvuvu National Park. Otherwise, pressures on the land are great. Hunting and fishing take place everywhere, but the population is very centralised and agricultural pressure around towns and villages is enormous in view of the extremely high population density.

(B) THE AKANYARU RIVER

General: The river rises in Rwanda, about 2300 m asl, but the important headwater tributary, the Mugere, rises in Burundi with sources at 2°50'S/29°27'E and 2°52'S/29°29'E, both close to 2450 m asl. In its lower course the Akanyaru meanders through a shallow valley, flanked on both banks by permanent swamps, beyond which are seasonally inundated savannas. The swamps begin at a point 2°46'S/29°50'E, from where the river flows more or less due north forming the border between Rwanda and Burundi. The swamp belt is best developed on the Burundi side, especially at the confluences of tributaries, up the valleys of which it reaches 6-10 km. There are estimated to be 14 600 ha of permanent swamps on this river in Burundi in a strip 63 km long. Both these swamps, and those in the valleys of right bank tributaries, are dominated by papyrus, with strips of swamp forest parallel with the river on less deeply inundated sites. In these, *Bridelia micrantha, Ficus verruculosa, Myrica kandtiana* and *Phoenix reclinata* are dominant close to the river, but with *Acacia polyacantha* var. *campylacantha, A. sieberana* and *Albizia gummifera* locally common farther away. No part of the valley is protected. The river and swamps are fished by artisans, and much of the seasonally inundated land is cultivated.

(C) THE MUGWEZI & LUABA RIVERS

General: These short streams flow into Lake Tanganyika in the south of Burundi. Permanent swamps occur on the Mugwezi (4°22'S/29°38'E), which enters the lake south of the town of Nyanza (4°20'S/29°36'E), and on the Luaba (4°18'S/29°38'E) which enters the lake just north of the town. Each of these papyrus swamps covers about 400 ha, while another swamp occurs on the lakeshore immediately south of Nyanza, and yet another, immediately behind the town. The land between the swamps, some of which is inundated seasonally, is cultivated. The wetlands are not protected. The flora and fauna is typical for the western equatorial part of the region.

(D) THE MALAGARASI RIVER SYSTEM

General: The Malagarasi rises on the Burundi/Tanzania border (4°06'S/29°47'E) on a hill almost overlooking Lake Tanganyika. It then flows NE, away from the lake, along the border, receiving several tributaries from the highlands of Burundi on its left bank, until at a point 3°47'S/30°24'E it meets the Lumpungu River flowing SW along the border. This latter stream also receives tributaries from the highlands of Burundi, particularly from the region of Mt. Nyarwana (3°15'S/30°28'E), 1930 m asl. From the confluence the Malagarasi flows into Tanzania, later to turn full circle and enter Lake Tanganyika. *

The river valley along the southern borders of Burundi is wide, shallow and savanna covered, with abundant *Isoberlinia* spp. A broad gallery of forest accompanies the river, and this is usually inundated after heavy rain in the Burundi catchments during November-December and again in March-April. There is much *Phoenix reclinata at* the water's edge, and in places, some *Cyperus papyrus.* In depressions the gallery forest is swampy containing species such as *Bridelia micrantha, Ficus verruculosa, Parkia filicoidea, Phoenix reclinata* and *Syzygium owariense,* but generally it is drier, inundated only for a few weeks at a time, and contains species such as *Albizzia gummifera, Diospyros mespiliformis, Ficus sycomorus, Khaya senegalensis* and *Syzygium cordatum.* The flora and fauna of the valley is as

described in the regional introduction for this part of the region, but the river is of special interest because it contains several species of fish which occur in the Zaire Basin but not in Lake Tanganyika. This suggests that the river is ancient and once, in pre-rift times, crossed the area where Lake Tanganyika now *is,* to enter the Zaire River.

Strips of permanent swampland occur on both banks of the river, 1250 m asl between 4°21'S/29°55'E and 4°18'S/29°59'E, and again between 4°10'S/30°05'E and 3°53'S/ 30°15'E. These latter swamps lead into bamboo forests in the north and are situated about 1200 m asl. They attain 5 km in width at the mouths of two tributaries, the Muyovozi and Mwoga Rivers. Other permanent swamps occur on the Ndanga (3°36'S/30°17'E-3°18'S/ 30°17'E) and Motetma (3°32'S/30°22'E-3°34'S/30°26'E) tributaries, both about 1250 m asl. Farther east the Lugusi River forms the Burundi/ Tanzania border for a short distance, and here again there are swamps on both banks in both countries (3°34'S/30°30'E-3°28'S/30°35'E) at an altitude of 1220 m. Still farther east, swamps occur on the upper Lumpungu (3°23'S/30°35'E-3°18'S/30°41'E) between 1240 and 1260 m asl, and these also abut bamboo forests on the Burundi side of the river.

Hunting and fishing occur in the main valley which contains approximately 14 000 ha of permanent swampland and a further large area of seasonal wetland. There *is* some agriculture. No part of the system is protected.

(E) EASTERN RIVERS

General: Small areas of permanent swampland occur on the Kahumo (2°59'S/30°44'E) and Mweruzi (3°03'S/30°43'E) Rivers in the far east of Burundi. The first of these swampy sections is on the Burundi/Tanzania border, and the second is just in Burundi, but both rivers flow into Tanzania, and both swamps are close to 1500 m asl. Neither area is protected.