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# **SURVEY OF KENYA ANNUAL REPORT 1971**

## **1. REVIEW OF THE YEAR**

1.1. The department continued its vital functions: the execution of surveys and the maintenance of large-scale plans for registration of land titles; the production and revision of a wide range of topographical maps for use in administration, defence, tourism, education, development planning, etc. Ancillary activities were aerial photography and technician training.

1.2. The number of expatriate officers in the department was further reduced as a result of retirement and consequently some Kenya citizens were promoted. For the first time for several years, there were no vacancies in the Staff Surveyor cadre.

1.3. University of Nairobi, North-East London Polytechnic and New Brunswick University, Canada, provided professional training of survey staff. Technical training continued at the Kenya Polytechnic and in the department.

1.4. The Financial Year 1971/72 saw an increase of 35 in the establishment. Approved Estimates for the same period rose to £702,292.

1.5. The demand for all manner of survey services was maintained but could not always be met due to limited resources.

1.6. The National Atlas was published and was well received. It now remains for it to be sold!

1.7. The Directorate of Overseas Surveys continued its mapping activities as part of British aid and field work was finalized for the Canadian mapping project under a loan agreement.

**P. P. ANYUMBA,**  
*Director of Surveys.*

## 2. ADMINISTRATION

### 2.1. General

The Survey of Kenya continued in the portfolio of the Minister for Lands and Settlement. This Ministry also includes the companion departments responsible for Government Lands, Land Registration, Land Adjudication, Land Settlement, Squatter Settlement and Town and County Planning.

Five provincial survey offices were maintained at Nairobi, Nakuru, Nyeri, Mombasa and Kisumu. In addition, there were 22 offices located in the districts.

The annual staff meeting occurred on 29th October.

### 2.2. Visits and Visitors

The Director made the following visits during the year:—

E.A. Land Survey Examinations Board, Kampala, May.

Kisumu Provincial Survey Office, May and August.

Conference of Commonwealth Survey Officers, Cambridge, August.

Federation of International Geodesists, Wiesbaden, September.

Among the visitors to the Survey of Kenya premises were.—

Mr. D. G. Warren, Director of Overseas Surveys.

Hon. J. H. Angaine, Minister for Lands and Settlement.

Hon. M. Kibaki, Minister for Finance and Economic Planning.

Mr. N. S. Kungu, Permanent Secretary, Ministry of Lands and Settlement.

His Excellency Ato Belai Abai, Minister for Land Reform and Administration, Ethiopia.

### 2.3. Establishment

According to the approved 1971/72 Estimates the department comprised the following categories of officers:—

Administrative and Professional	...	...	34
Executive and Technical	...	...	166
Clerical and Sub-technical	...	...	247
Drivers	...	...	133
Subordinate staff	...	...	428
Total	...	...	<u>1,008</u>

—an increase of 35 posts.

TABLE E.1

<i>Post</i>	<i>Establishment at 31st December Vacancies 1971</i>	
Director of Surveys .. .. .	1	—
Assistant Director of Surveys .. .. .	3	—
Superintendent of Surveys .. .. .	3	2
Executive Staff .. .. .	12	2
Secretarial Staff .. .. .	4	1
Clerical and Analogous Staff .. .. .	52	—
Records Officer, Grade I .. .. .	1	—
Records Officer, Grade II .. .. .	2	—
Records Officer, Grade III/Junior Records Officer, Grade I and II .. .. .	15	—
Artisans .. .. .	3	—
<b>SURVEY FIELD STAFF</b>		
Staff Surveyors .. .. .	27	2
Computer .. .. .	1	—
Senior Survey Assistants .. .. .	4	—
Survey Assistants, Grade I .. .. .	26	5
Survey Assistants, Grade II .. .. .	43	17 (a)
Survey Assistants, Grade III/Junior Survey Assistants .. .. .	75	10
Hedge Inspectors .. .. .	10	—
Area Computers .. .. .	19	—
Technical Assistant .. .. .	1	—
Survey Plan Examiners .. .. .	2	2
Drivers .. .. .	133	1
Subordinate Staff .. .. .	428	—
<b>CARTOGRAPHIC AND REPRODUCTION STAFF</b>		
Chief Cartographer .. .. .	1	—
Superintendent (Reproduction) .. .. .	1	—
Senior Cartographers .. .. .	3	—
Cartographers, Grade I .. .. .	9	—
Cartographers, Grade II .. .. .	23	3
Cartographers, Grade III/Junior Cartographers	95	—
Assistant Draughtsmen, Grade II/III .. .. .	25	2
Photo-Lithographers, Grade I .. .. .	1	—
Photo-Lithographers, Grade II .. .. .	2	—
Photo-Lithographers, Grade III/Junior Photo- Lithographers .. .. .	16	—
<b>AIR SURVEY STAFF</b>		
Senior Photogrammetrists .. .. .	3	—
Photogrammetrists, Grade I .. .. .	5	1
Photogrammetrists, Grade II .. .. .	10	5
Air Photographic Officer .. .. .	1	—

NOTES.—(a) Seventeen Survey Assistants, Grade III held against these vacancies.

TABLE E.2

			<i>New Appointments</i>	<i>Promotions</i>	<i>Resignations, Retirements, Transfers.</i>
Assistant Director of Surveys .. ..		—	1	—	
Superintendent of Surveys .. ..		—	—	—	
Staff Surveyors .. ..		8	—	3	
Assistant Surveyors .. ..		2	—	—	
Survey Assistants Grade I .. ..		—	2	—	
Survey Assistants Grade II .. ..		—	6	—	
Survey Assistants Grade III .. ..		—	15	3	
Junior Survey Assistants .. ..		16	—	4	
Area Computers .. ..		1	—	1	
Technical Assistant .. ..		1	—	1	
Chief Cartographer .. ..		—	—	—	
Cartographers Grade I .. ..		—	19	1	
Cartographers Grade II .. ..		—	—	—	
Cartographers Grade III .. ..		—	7	2	
Junior Cartographers .. ..		16	—	4	
Draughtsmen Grade I/II/III .. ..		2	—	1	
Senior Photo-Lithographer .. ..		—	—	—	
Photo-Lithographer Grade II .. ..		—	2	1	
Photo-Lithographer Grade III .. ..		—	1	—	
Junior Photo-Lithographers .. ..		—	—	1	
Senior Photogrammetrist .. ..		—	—	1	
Photogrammetrists Grade I .. ..		—	—	—	
Photogrammetrists Grade II .. ..		—	1	—	
Junior Records Officers Grade I .. ..		—	—	—	
Junior Records Officers Grade II .. ..		—	1	—	
Executive Staff .. ..		—	—	1	
Personal Secretary Grade II .. ..		—	—	—	
Secretarial, Clerical and Analogous Staff		6	—	2	
Drivers .. ..		3	—	2	

## 2.4. Finance

Implementation of the Ndegwa Commission Salaries Review Report on 1st July, 1971 produced a substantial increase in the overall provision for the department as a whole. The Ndegwa salary increases obscure an approved increase of approximately £60,000 as between the 1970/71 and 1971/72 Financial Years.

TABLE F.1—APPROVED ESTIMATES (REVISED)  
EXPENDITURE (K£)

Year	Adjudication Surveys (Development)			Other Surveys (Recurrent)			Survey of Kenya
	P.E.	O.C.	Total	P.E.	O.C.	Total	Total
1970/71 ..	235,310	73,988	309,298	134,516	73,062	207,578	516,876
1971/72 ..	333,645	70,000	403,645	119,009	179,638	298,647	702,292

APPROPRIATIONS IN AID (K£)

Year	Development grants (for adjudication Surveys)			Survey fees Sale of maps, etc.	Total
1970/71 ..	..	..	309,298	82,000	391,298
1971/72 ..	..	..	403,645	64,000	467,645

## 2.5. Labour

The authorized establishment for the subordinate staff was increased from 389 to 464. Late in December thirteen sub-staff were retired, whose posts should be filled in the year 1972.

## 2.6. Stores

The total value of stores on departmental charge rose to K£1,271,950. New items were purchased locally and they amounted to K£16,100. Stores unserviceable due to wear and tear sold by public auction valued K£65. The total inventory holders totalled 273 for 9,377 items.

## 2.7. Transport

The transport fleet increased from 123 to 133 as a result of the ten additional Land-Rovers, which were ordered late in 1970 and received this year. Three 3-ton lorries, one Minimoke and nine Land-Rovers were recommended for write off.

A few cases concerning misuse of government vehicles were reported to this office by Government Check Unit and the officers in charge of the vehicles were accordingly advised to adhere to Government regulations.



## **2.8. Buildings**

Office and staff quarters were completed in Migori, Kapsabet and Narok and were being built in Kabarnet, Maralal, Kwale and Kilifi. It was anticipated that building would also start in Kitui and Siaya in 1972/73 financial year. Most of the buildings started in 1971 will be completed in 1973.

## **3. LAND SURVEYORS BOARD**

The Land Surveyors Board comprises the Director of Surveys, (Chairman), two (Licensed) Government Surveyors nominated by the Minister for Lands and Settlement, and two unofficial members, being Licensed Surveyors, elected by the Association of Land Surveyors of Kenya. It carries out certain statutory functions in connexion with the control of land surveys under the Survey Act. During 1971, the Board met four times.

The Board's Law Examinations were held in February and November, 1971, and of the ten candidates who sat the February examination none passed, but four of the fifteen who sat in November passed. Four Land Surveyors' Licences were issued to candidates who attempted the trial survey, one being to the first African to complete the Licence Examination.

Of the two candidates from Kenya who attempted the East African Land Survey Certificate (Intermediate) Examinations none was successful. There were no candidates from Kenya for the finals of this examination.

At the end of the year there were twenty-one Licensed Surveyors in Kenya. Of these, twelve were in private practice, three in academic institutions and six in Government, Local Government, public organizations or in retirement.

## **4. CADASTRAL BRANCH**

### **4.1. General**

In response to the building boom, more and more cadastral surveys became necessary. This includes New Grant Surveys and subdivisional surveys. Government Surveyors continued to satisfy the former need while Private Licensed Surveyors continued to meet the latter need.

Four new Staff Surveyors joined the Cadastral Branch and were engaged either in checking surveys or field duties.

## 4.2. Cadastral Surveys

The total number of surveys submitted for checking rose slightly from 465 for 1970 to 477 in 1971. The number of surveys checked to final stage rose from 343 to 565 at the end of the year. The number of surveys outstanding was 134, a drop compared with a balance of 177 in 1970.

## 4.3. Settlement Mapping

There was no topographical base-mapping programme.

A total of seven settlement schemes were checked against Development Plans. Queries were marked on the machine plots and passed to the field for investigation.

Title mapping was completed for the following schemes:—

Ainabkoi North (52), Tulaga (256), Njabini (259), Karati (258) a total of 2,186 parcels of 18,811 hectares.

In addition to the normal duties carried out by this office, permanent improvement plots of eleven settlement schemes in Lugari Complex Phase II, and eight schemes in Sotik Complex, were marked and annotated on to 1:10,000 Development Plans and prints were passed to the Directorate of Overseas Surveys in U.K.

TABLE C.1—SURVEYS FOR TITLE IN 1971

Government or Private	Farm and Farm Subdivisions		Townships and Residential		Miscellaneous		Totals	
	Parcels	Area (Ha)	Parcels	Area (Ha)	Parcels	Area (Ha)	Parcels	Area (Ha)
Government ..	43	88,514.30	1,515	477.78	3	1,082.57	1,561	90,074.65
Private ..	98	5,686.65	1,027	5,242.25	72	16.45	1,197	10,945.35
Settlement Scheme Surveys ..	—	—	3	19.44	—	—	3	19.44
<b>TOTAL ..</b>	<b>141</b>	<b>94,200.95</b>	<b>2,545</b>	<b>5,739.47</b>	<b>75</b>	<b>1,099.02</b>	<b>2,760</b>	<b>101,039.44</b>

## 4.4. Computing and Checking

TABLE C.2

	No.	Man-days
Surveys examined and approved .. .. .	486	1,301
Plans compiled (Deed and Survey) .. .. .	96	201
Survey data issued .. .. .	197	79
Comments on Subdivisional Schemes .. .. .	456	65
Sets of Deed Plans signed .. .. .	1,580	254

## 4.5. Boundaries and Cadastral Fair Drawing Office

This drawing office consists of two sections—Boundaries Section and Cadastral Fair Drawing Section.

### 4.5.1. Boundaries Section

This section, continued to be responsible for the preparation of boundary plans and drafting of boundary schedules, checking of administrative boundaries on maps for the revision of 1:50,000 and 1:250,000 scales topographical maps, colouring of boundary plan prints and miscellaneous drawing jobs. The following work was completed:—

TABLE C.3

Boundary Plan prepared .. .. .	5
Boundary Schedules drafted and checked .. .. .	7
Forest boundary plans checked .. .. .	6
Administrative boundaries checked on topographic maps ..	71
Colouring of new boundary plan prints .. .. .	82
Colouring of (Maps and Prints) other .. .. .	41
Miscellaneous drawing jobs .. .. .	56

### 4.5.2. Cadastral Fair Drawing Section

This section was responsible for the preparation of Registry Index Maps (R.I.M.s) to facilitate registration of parcels under the Registered Land Act (R.L.A.) R.I.M.s were prepared at various scales, thus:— 1:50,000 (Series S.K. 49) 1:10,000 (Series S.K. 21) of Northern and Southern Coast of Mombasa Mainland and Settlement Scheme areas, and 1:2,500 (Series S.K. 50) of Settlement Scheme towns. The analysis of work for 1971 is given in Table C.4.

TABLE C.4—REGISTRY INDEX MAPPING

<i>Scale</i>	<i>No. of Sheets</i>
1 : 50,000 (Series S.K. 49) .. .. .	2
1 : 10,000 (Series S.K. 21) Northern and Southern Coast ..	3
1 : 10,000 (Series S.K. 21) Roka Settlement Scheme ..	3
1 : 2,500 (Series S.K. 50) 17 towns .. .. .	37
Miscellaneous drawing jobs .. .. .	135

#### 4.6. Records Drawing Office

This office continued to be responsible for the following tasks:—

- (a) Maintaining and keeping up to date record and revision copies of all map series, i.e. any transaction involving sub-divisional approval, offer of new grant, survey of registration which in any way affects surveyed cadastral boundaries is charted on the relevant record plan. Changes in registered boundaries are charted on the relevant Registry Index Maps and tracings.
- (b) Preparation of deed plans from approved cadastral surveys in support of registration of plots under Registration of Titles Act (R.T.A.)
- (c) Tracing of approved survey plans (for the purpose of producing dyeline prints from the tracings).
- (d) Preparation of various plans, e.g.:—
  - (i) Background plans which illustrate applications for sub-divisional approval.
  - (ii) Water Board plans which illustrate applications to the Water Board for any changes to the water supplies.
  - (iii) Special plans which show the location of plots advertised for alienation.
- (e) Compilation of Survey Plans from surveyors' computations and field notes.
- (f) Checking of all the above plans.
- (g) Miscellaneous jobs.

TABLE C.5—COMPARATIVE PROGRESS

	1970	1971
Subdivisional plans prepared .. .. .	68	67
Special plan prepared .. .. .	72	72
Tracings prepared .. .. .	308	366
Deed plans compiled .. .. .	811	393
Plans checked .. .. .	2,046	2,165
Plans charted .. .. .	3,232	3,908
Survey plans compiled .. .. .	20	49
Miscellaneous jobs .. .. .	624	286

#### 4.7. Survey Records Office

Responsibility encompasses the custody, indexing and referencing of original survey plans, tracings, deed plans, etc., relating to all surveys under R.T.A. and an increasing number under the R.L.A. The office also met requests for dyeline prints of such plans.

TABLE C.6

	<i>Transactions during</i>	
	1970	1971
Survey plans outstanding .. .. .	Nil	Nil
Survey plans received .. .. .	389	483
Survey plans registered .. .. .	389	483
Survey plans awaiting registration .. ..	Nil	Nil
Miscellaneous surveys (without plans) received	70	68
Miscellaneous surveys (without plans) registered	70	68
Resubmissions received .. .. .	8	Nil
Resubmissions registered .. .. .	8	Nil
Deed plans numbered .. .. .	1,599	1,576
Deed plans received .. .. .	1,671	1,508
Deed plans signed .. .. .	1,453	1,565
Deed plans despatched (issued) .. .. .	1,166	1,586
Township plans registered .. .. .	131	151
Approved subdivision schemes .. .. .	254	196
Miscellaneous jobs .. .. .	27	58
Prints issued .. .. .	14,553	15,472

TABLE C.7—NEW CADASTRAL SURVEYS REGISTERED IN 1971

DESCRIPTION	BY GOVERNMENT		BY PRIVATE SURVEYORS		TOTAL	
	Parcels	Area (Ha)	Parcels	Area (Ha)	Parcels	Area (Ha)
New alienations—Farms ..	13	88,434.11	7	136.01	20	88,570.12
Subdivisions—Farms ..	28	80.19	91	5,550.64	119	5,630.83
New plots—Townships ..	1,301	314.92	561	241.97	1,862	556.89
Subdivisions—Townships ..	214	162.86	366	5,000.28	580	5,163.14
Resurveys and Revisions ..	3	1,082.57	72	16.45	75	1,099.02
Trig. and Standard Traverse	2	—	3	—	5	—
Settlement Scheme Farms ..	—	—	—	—	—	—
Settlement Scheme Towns ..	2	19.37	1	0.07	3	19.44
Conversions (Compiled Plans) ..	—	—	—	—	—	—
Miscellaneous (Compiled Plans) ..	13	—	—	—	13	—
<b>TOTALS .. ..</b>	<b>1,576</b>	<b>90,094.02</b>	<b>1,101</b>	<b>10,945.42</b>	<b>2,677</b>	<b>101,039.44</b>

## 5. MAPPING AND TECHNICAL BRANCH

### 5.1. Triangulation and Traversing

The Kenya party of the Directorate of Overseas Surveys continued its work of assisting with the establishment of additional survey control and mapping in development areas.

The work involved the following different types of control:—

(a) Establishment of fourth order points for special projects, adjudication and settlement mapping.

(b) Establishment of control points for 1:50,000 scale mapping.

Fourth order points were established in many areas, including Kajiado (Central and North Kaputei Registration Sections), Lugari Settlement complex (Phase III) and Eldama Ravine Settlement complex. Mapping control points were established in Kitui and North Meru.

Departmental surveyors also continued to carry out tellurometer photo-control field work for adjudication and settlement scheme large-scale photogrammetric mapping.

### 5.2. Geodetic Levelling

Work continued on the Kisumu-Kisii-Sirari (Tanzania border) level line, reaching Awendo (about half-way between Kisii and Sirari) by the end of the year. Field work should be completed by the middle of next year.

### 5.3. Aerial Photography

Departmental staff obtained large-scale photography for use of the Survey of Kenya and other Government departments, etc., during 122 sorties totalling 322 flying hours, including navigational training for one of the air-camera operators.

The following areas were photographed:—

*For Settlement Scheme Title Surveys.*—Lugari complex (Phase III).

*For Adjudication (P.I.D.s and Base Mapping).*—Kikoneni (Malamba/Bumbani), Baringo (Mugerin/Kibomoi), Kitui (Matinyani), Uyoma (Naya/Katweng'a II), Kilifi (Kaloleni/Chasimba), Elgeyo (Kerio), Embu (Mbere), West Nyokal (Kanyamua), Bunyala (Buofu/Obaro).

*For Ministry of Works (Roads Branch).*—Kalii-Kikima, Nyeri Roads, Kirwara-Kirianini, Karatina-State Lodge-Kiganjo, Kimilili-Chwele-Sirisia-Malakisi, Malaba-Busia, Marigat-Kabarnet.

*For Town Planning, etc.*—Liboi, Hagadera, Dadaab, Gatua Nyaga Estate (Proposed T.C.), Mau Narok, Tot, Nairangengare, Kaputir, Mutomo, Mwingi, Nyamira, Kaptumo, Luanda, Machakos Extension, Wajir, Maragua, Kandara, Makuyu, Gatukuyu, Mbooni (Kikima), Nginyang, Tenges, Namanga, Tumu Tumu, Kiambu, Kirua, Chemelili, Subukia, Kabiyet.

*Miscellaneous.*—Buchuma Range Area, Makindu Range Area, Pemba River Reservoir, Nairobi-Eldoret Railway (Gaps).

In addition to work executed by ourselves, Spartan Aero Ltd. of Canada completed the remaining photography in the Canadian Aid Mapping Project area of southern Kenya.

#### **5.4. Air Survey**

Mapping of the following was carried out by the Air Survey Section during the year:—

Settlement (Cadastral Mapping at 1:2,500 or 1:5,000 scale):  
20,473 hectares covering Uaso Nyiro Complex, Ulu and Ndalat.

Adjudication (Topographical Mapping at 1:5,000 scale): NIL.

Towns (Topographical Mapping at 1:2,500 or 1:5,000 scale).

The following towns were mapped:—Nakuru Extension, Ukwala, Kitengwani, Amagoro, Kocholia, Nairobi, Gongoni, Kwale, Dol Dol, Habaswein, Moyale Sokoke, Jilore, Ruruma, Kakuyuni, Wundanyi, Tabaj, Khoraf, Harar, Ithareini, Lumbwa, Giriftu, Mudo Gashi, Sosiot, Kipsonoi, Roret, Tenwek, Longisa, Kirua, Kangeta, Chemelil, Masii, Khwisero, Butula, Ruiru, Merti, Paponditi, Kihancha, Ndhiwa, Ogembo, Chwele, Kipkabus, Kapsakwany, Kiminini, Kakamega, Esageri, Kaptagat, Machakos Extension, Mtepeni, Vipingo.

Takaungu, Garba Tula, Marikebuni, Kajiado, Manga, Buna, Meru Ext., Marafa, Kiamutugu, Kimbimbi, Gazi, Fundisa Kabaoni, Baragoi, Sagana, Mwarakaya, Embu Extension, Mumias, Siakago, Mwatate, Maralal, Garissa Extension, Chebiemit, Litein, Kapkatet, Lessos, Dundori, Kapsowar, Kiboswa, Tumu Tumu, El Wak, Malava, Makueni, Nyambunwa, Dabaad, Wamagana, Wajir, Kebirigo, Hagadera, Liboi, Nunguni (Kilome), Kaptarakwa, Sirisia, Funyula, Saboti, Broderick Falls Extension, Lokwawakangole, Gatua Nyaga Estate (Proposed T.C.).

Topo Revision (1:50,000 scale): Sheets 104/2, 104/4, 107/2, 107/4, 108/1, 108/2, 118/1, 121/2, 122/1, 148/1, 181/2, 181/4, 135/1, 135/3, 182/3, 196/3, 196/4, 200/3, 201/1.

*Special purposes.*—Base mapping at 1:2,500 with 5 ft. contours of proposed Mwachi Dam site for Mombasa water supply; Uplands-Limuru road.

## 5.5. Computing Office and Records

Routine computation of photo-control work, co-ordinate transformations, trigonometric control, etc. was carried out in the computing office. The I.C.L. 1500 series electronic computer was withdrawn from production but use could not be made of the University 1900 series computer as the data preparation equipment had not been re-coded. Interest was shown in the new Hewlett Packard 9810A (Model 10) Desk-Top computer and it was decided this would solve most of our computer problems. Funds were therefore made available for the purchase of one during the 1971/72 Financial Year.

The reprinting of the Survey Manual was completed and a few copies in special plastic covers bound. For the remaining copies cardboard covers had still to be prepared. Maintenance and updating of records also continued.

Calibration of both metric and imperial measuring bands continued, with a total of 125 bands being calibrated during the year.



## 5.6. Mapping

5.6.1. *Basic Series (Diagram 4)*.—1:50,000 Y731 Revision and Reprinting: 6 sheets were field checked for D.O.S. 17 sheets were field checked for the Canadian Mapping Project. 10 sheets were revised and new editions published by Survey of Kenya. 14 sheets (new editions) were produced by D.O.S. 43 sheets reprinted.

1:50,000 Y731 General: 68 sheets remain on old specifications. 102 sheets are contoured at 50 or 100 ft. V.I. 42 sheets are contoured at either 20 or 40 metres V.I.

1:100,000 Y633: 7 sheets of this series were reprinted.

5.6.2. *Compiled Series—Medium and Small-scales*.—1:250,000 Y503 (Diagram 5). 10 sheets were revised and new editions published.

1:1,000,000 Route Map, Physical and General and Hunting Map: These sheets will be printed from the same material in future with an additional 2 plates for each. Revision of material is in hand.

1:2,500,000 East Africa: Work on this new sheet continued slowly pending receipt of revision material from Tanzania.

5.6.3. *Township Plans (Diagram 7)*.—1:5,000 Nairobi S.K. 66. 11 sheets completed (the last sheet in that series). Large-scale aerial surveys for town planning were produced for 12 major urban areas and for 32 minor urban areas.

5.6.4. *Administrative Mapping*.—1:50,000 Series S.K. 61. 11 sheets printed showing administrative boundaries. 81 sheets of this series are now shown with boundary overprints. 1:250,000 Series S.K. 60. 10 sheets printed showing administrative boundaries.

5.6.5. *National Parks Mapping*.—1:250,000 Tsavo West National Park—New edition published. 1:25,000 Nairobi National Park—Reprinted.

5.6.6. *Miscellaneous Mapping and Literature*.—1:20,000 Nairobi S.K. 64—New edition published. 1:2,000,000 Tourist Map—Reprinted. President's Award—Duke of Edinburgh's Award. Special map at 1:250,000 for the Kenya Gold Award Expedition. Annual Report Diagrams at 1:3,000,000—New editions prepared. Settlement Schemes Map at 1:1,000,000—New editions prepared for the Treasury. Rainfall Maps at 1:2,000,000: Maps for the months of

January, February and March. Kenya Tourist facilities and Communications at 1:3,000,000. Special map for a book *Kenya Profile*.

5.6.7. *National Atlas of Kenya*.—This book was completed, bound and published for sale.

5.6.8. *Gazetteer of Geographical Names*.—A revision copy of the *Gazetteer* is being maintained as well as a card index system but no progress has been made in preparing plates for a 2nd edition of the *Gazetteer*.

5.6.9. *Field Revision*.—Due to the shortage of surveyors, Cartographic staff were employed on field checking with encouraging results.

## 5.7. Photo-Lithography

From the Table R.I below it will be seen that the number of print orders increased in 1971 but the number of colour impressions decreased.

Forty-six aerial films were processed and dark-room facilities were again made available to the K.A.F. for enlargement purposes.

The Savin 220 copy machine continues to be of great value to the department.

As in previous years all training was carried out during the daily duties of the staff.

TABLE R.I—COMPARATIVE PRODUCTION—REPRODUCTION SECTION

	1969	1970	1971
<i>Studio:</i>			
Film Negatives and Contracts ..	2,864	3,533	2,638
Bromide Contracts .. .. .	27,777	26,530	20,801
Bromide enlargements .. .. .	3,858	3,609	3,207
Diapositives .. .. .	1,558	1,542	1,739
Photostat copies .. .. .	3,109	13,438	5,573
Monotype Lettering .. .. .	398	454	527
Dyeline prints .. .. .	38,709	39,398	25,739
Autopositive prints .. .. .	13	231	64
Savin 220 Photo copier .. .. .	—	16,976	17,987
<i>Printing down:</i>			
Machine Plates (Double-demy and Gestetner) .. .. .	1,096	855	974
Astrafoil Prints made .. .. .	3,359	1,496	2,660
Astrafoil Sheets used .. .. .	769	638	797
<i>Press Room:</i>			
Colour impressions .. .. .	2,382,851	1,986,601	1,770,105
Gestetner impressions .. .. .	487,875	209,625	321,871
Dufa Flat-bed Proving Press .. .. .	19,421	124,449	23,561
Total Printing Orders .. .. .	233	225	237

## 5.8. Map Sales and Issues

Sales realized £28,996 which is more than twice the figure for 1970. Issues represented a value of £16,335. Atlases accounted for 21 per cent of the total value of sales.

TABLE F.2—MAP SALES AND ISSUES

	From Survey H.Q.		From Field H.Q.		From Public Map Office		From District Survey Offices	
	(S)	(I)	(S)	(I)	(S)	(I)	(S)	(I)
Maps .. ..	K£ —	K£ —	K£ 5,710	K£ 1,982	K£ 7,558	K£ 7,057	K£ 1,081	K£ 879
Dyline Prints ..	} 796	1,694	7,177	3,891	} 146	—	111	12
Photostat copies			206	—				
Atlases .. ..	—	—	2,248	820	3,545	—	418	—
TOTAL K£	796	1,694	15,341	6,693	11,249	7,057	1,610	891

(S) = Sales; (I) = Free Issues.

## 6. TRAINING

### 6.1. Kenya Polytechnic

All surveying courses that were being held at the department are now being held at the Kenya Polytechnic.

Sixteen students from the Survey of Kenya were enrolled in May, 1971 to read the first year course while nine started on the final year course at the Kenya Polytechnic.

Nine students passed the Kenya Polytechnic Modified examination and are to be promoted to Survey Assistants III. Eight passed the first year examination and will get an advancement in salary, while five passed the final year examination and are to be promoted to Survey Assistants II.

### 6.2. Departmental Training

The following courses are being held at the Survey Field Headquarters:—

#### (a) Land Adjudication Basic Course

These courses are held for Junior Survey Assistants from the Land Adjudication Department. The courses are aimed at giving the J.S.A.s the basic theories of the methods used in Land Adjudication.

The eighth course was held from 25th January, 1971 to 1st April, 1971. The ninth course from 12th August, 1971 to 14th October, 1971, while the tenth course from 1st November, 1971 to 7th January, 1972. Each course consisted of about 20 students.

*(b) County Council Surveyors Course*

A course for County Council Surveyors from various parts of Kenya was held from 16th April, 1971 to 15th July. This course was aimed at giving the surveyors a basic idea of engineering surveying. Eighteen officers attended this course.

*(c) Basic Cartographic Course*

A basic cartography course for school certificate holders was held, as in the past, commencing in June, 1971 for a duration of eight months. Sixteen students from the Survey of Kenya attended this course together with four from other institutions.

Those who are successful in this course have reached the standard of a Cartographer III.

By 1973 this course will be held at the Kenya Polytechnic.

### 6.3. Examinations

The Survey of Kenya Occupational Tests were held in March, 1971. The following numbers of officers passed these tests and received good reports on their day-to-day work as a result of which they will be promoted subject to the availability of vacancies.

<i>Category</i>	<i>From Grade</i>	<i>To Grade</i>	<i>No. of Officers</i>
(a) Survey Assistants .. .. .	II	I	2
	III	II	6
(b) Cartographers .. .. .	Junior	III	9
	II	I	1
(c) Photo-Lithographers .. .. .	Junior	III	8
	III	II	2
(d) Photogrammetrists .. .. .	Junior	III	1
	II	I	1
(e) Junior Records .. .. .	III	II	1
	II	I	3
	Sub-Staff	I	2

By 1974 all surveying examinations will be conducted by the Kenya Polytechnic.

#### **6.4. Professional and Overseas Training**

The University of Nairobi continued offering a course leading to the degree B.Sc. Engineering (Land Surveying and Photogrammetry). Students reading this course, however, were sponsored by the Ministry of Education. In 1971 the department employed five graduates from this university as Staff Surveyors and one from the N.E. London Polytechnic as an Assistant Surveyor.

One student continued to read a five-year degree course in Surveying at the University of New Brunswick, Canada.

### **7. ADJUDICATION BRANCH**

#### **7.1. General**

Adjudication Branch continued to execute surveys in Trust Land Areas in accordance with the Accelerated Land Adjudication Programme. Although there was a slight improvement in numbers, the staff position was still inadequate. The year saw an improvement in area covered in range areas (three times the acreage in 1970), while there was a slight increase in acreage covered in agricultural areas.

#### **7.2. Categories of Work**

The work done in the field by the branch during 1971 was mainly in Adjudication Sections in the current programme. The current programme falls into two parts:—

(i) Range Land.

(ii) Agricultural Land.

The Agricultural land is further divided into consolidation areas, non-consolidation areas and distribution areas.

#### **7.3. Maps and Diagrams**

The branch produces the following types of Maps and Diagrams:—

(a) Topographical base maps on which planning of consolidated holdings is done in consolidation areas or property boundaries are surveyed in non-consolidation areas.

- (b) Cadastral Maps (Registry Index Maps). Those not done under our direction and considered to be final are called Demarcation Maps.
- (c) Demarcation Maps will continue to be called so until they are re-surveyed.
- (d) Preliminary Index Diagrams (P.I.Ds). These are produced from enlarged photographs and serve as interim maps.
- (e) 1 : 50,000 Interim Registry Index Maps prepared by identification in range areas.

#### **7.4. Areas and Parcels**

The total amount of work in each category processed at various scales for registration of title is as follows and details are given in the appendix:—

- (a) Range areas, current programme—262,239 hectares (66 parcels).
- (b) Agricultural areas, current programme—247,628 hectares (88,293 parcels).
- (c) No registration section was redone by Survey of Kenya.

#### **7.5. Other Work**

In support of the programme the following work was also carried out:—

- (i) Flying for production of aerial photographs.
- (ii) Preparation of photoenlargements.
- (iii) Preparation of Topographical base maps.—(203 sheets covering 20,335 hectares).
- (iv) *Field Work*.—The main task continued to be field supervision of the Land Adjudication Department J.S.As in preparation of all registry maps. In addition our staff were engaged on premarking and fixing of ground control for air photography, carrying out of mutation surveys and surveying sub-location boundaries in Taita and Baringo Districts.

# 1. REGISTRATION SECTION IN CURRENT PROGRAMME

## 1.1. AGRICULTURAL LAND

### (a) Consolidation Areas.

#### (i) Topographical Base Maps 1:2,500

Nil

#### (ii) Registry Index Maps

Province	District	Reg. Section	Scale	Sheets	Parcels	Hectares
Central ..	Murang'a ..	Mirira ..	1:2,500	33	1,590	3,210
„	Kirinyaga ..	Mutithi ..	„	12	537	869
„	„	Mutithi Strip ..	„	20	235	1,030
Eastern ..	Meru ..	Thuura ..	„	36	1,583	3,183
„	„	Gitie ..	„	11	407	612
„	„	Kijja ..	„	13	469	828
„	„	Kinoro ..	„	32	949	2,120
„	„	Kianjogu ..	„	19	787	1,633
„	„	Kiraro ..	„	18	786	1,050
Total ..				194	7,343	14,533

### (b) Non-Consolidation Areas.

#### (i) Topographical Base Maps

Province	District	Reg. Section	Scale	Sheets	Hectares
Rift Valley ..	Baringo ..	Issas ..	1:2,500	17	1,954
„	Nandi ..	Kamobo ..	„	32	18,381
„	„	Kaplamai ..	„	40	
„	„	Chekunyuk ..	„	17	
„	„	Mugen ..	„	35	
„	„	Kaptumek ..	„	21	
„	„	Kongoro ..	„	21	
„	„	Maraba ..	„	20	
Total ..				203	20,335

## (ii) Registry Index Maps

<i>Province</i>	<i>District</i>	<i>Reg. Section</i>	<i>Scale</i>	<i>Sheets</i>	<i>Parcels</i>	<i>Hectares</i>
Coast ..	Taita ..	Kishamba ..	1:2,500	13	1,155	806
Rift Valley	Kericho ..	Silibwet ..	1:5,000	10	879	3,140
"	"	Kimulot ..	"	15	689	4,116
"	"	Kapkimolwa ..	"	13	1,012	4,761
"	"	Kipsonoi ..	"	14	1,224	5,477
"	"	Kapsimbiri ..	"	13	985	4,506
"	"	Chesoan ..	"	17	1,871	6,155
"	"	Chemaner ..	"	16	1,115	4,758
"	Nandi ..	Chepterwai ..	1:2,500	27	666	3,111
"	"	Kapkolei ..	"	15	321	1,276
"	Elgeyo/Mara-	Kapcherop ..	"	35	896	3,673
"	kwet.	Kapkanyor ..	1:5,000	8	50	989
"	"	Kondabilet ..	"	7	188	1,572
"	Baringo ..	Tinet ..	"	5	100	738
"	Kajiado ..	Rombo "B"	"	4	19	291
		Block I (small Holdings).				
"	"	Rombo "B"	"	3	39	488
		Block II.				
"	"	Rombo "B"	"	5	66	454
		Block III.				
"	"	Kimana/Tikondo (Small Hold- ings).	"	13	355	3,449
		Total ..		<u>233</u>	<u>11,630</u>	<u>49,760</u>



## (iii) Preliminary Index Diagrams.

Province	District	Reg. Section	Scale	Sheets	Parcels	Hectares
Nyanza ..	Siaya ..	Gongo ..	1:2,500	8	487	871
"	"	Nyandiwa ..	"	14	669	1,239
"	"	Siriwo ..	"	9	786	846
"	"	Sigomore ..	"	21	634	1,851
"	"	Uranga ..	"	15	570	1,775
"	"	Kagilo ..	"	12	1,120	1,538
"	"	Ramula ..	"	16	842	1,561
"	"	Ulamba ..	"	8	791	797
"	"	Kanyadet ..	"	13	1,016	1,164
"	"	Ndenga ..	"	23	1,053	1,716
"	"	Nyawita ..	"	28	862	3,907
"	"	Gombe ..	"	18	994	2,250
"	"	Kogelo/Nyango- ma.	"	15	951	1,423
"	"	Simenya ..	"	11	341	614
"	Kisumu ..	E. Koguta ..	"	21	1,649	2,189
"	Homa Bay ..	Kamagawi ..	"	17	576	962
"	"	Koyolo ..	"	16	539	1,102
"	"	Wasweta II ..	"	54	817	8,618
"	"	Kotieno Kowor	"	35	924	2,496
"	"	Genga ..	"	35	1,422	2,765
"	"	Kameji ..	"	15	526	1,401
"	"	Kodhoch West	"	25	797	1,942
"	"	Kakangutu West	"	18	719	1,497
"	"	Kogweno Rak- waro.	"	7	400	443
"	"	Kanyipir ..	"	14	944	1,236
"	"	Bwisaboka ..	"	74	752	11,617
"	"	Area "B" (Kwa)	"	37	768	3,882
"	Kisii ..	Bonyarorande	"	33	1,117	2,854
"	"	Mwogeto ..	"	23	1,560	2,564
"	"	Bogetaorio II ..	"	37	2,259	4,474
"	"	Monyerero ..	"	23	1,208	2,294
"	"	Mogwagwa I ..	"	29	1,190	2,574
"	"	Mogwagwa II ..	"	12	405	961
"	"	Bomwagamo ..	"	21	1,271	2,203
Western ..	Busia ..	Apokor ..	"	48	1,141	6,346
"	"	Chakol ..	"	26	912	4,178
"	"	Amukura ..	"	61	1,417	7,870

## (iii) Preliminary Index Diagrams—(Contd.)

Province	District	Reg. Section	Scale	Sheets	Parcels	Hectares
Western ..	Busia ..	Asinge ..	1:2,500	33	1,020	4,908
"	"	Nambuku Lugala ..	"	15	384	914
"	"	Kolanya ..	"	24	419	2,241
"	"	Osurete ..	"	31	1,147	4,950
"	"	Moding ..	"	31	665	3,117
"	"	Aboloi ..	"	37	587	3,386
"	"	Buburi ..	"	23	573	2,232
"	"	Angurai ..	"	31	688	3,668
"	Bungoma ..	S. Namwela ..	"	25	570	2,737
"	"	N. Nalando ..	1:5,000	26	1,565	6,678
"	"	N. Kulisiru ..	"	29	668	3,136
"	"	S. Kulisiru ..	"	25	500	2,926
"	"	S. Myanga ..	"	31	776	3,712
"	"	Khasoko ..	"	21	590	2,327
"	"	West Siboti ..	"	31	621	3,038
"	Kakamega ..	Kegondi ..	"	12	1,069	841
"	"	Shikulu ..	"	24	2,348	3,299
"	"	Shiseso ..	"	15	1,320	2,001
"	"	Matsakha ..	"	44	844	4,147
"	"	Senende ..	"	11	905	677
"	"	Hamisi ..	"	10	893	827
"	"	Banja ..	"	15	960	1,114
"	"	Shibuname ..	"	13	1,483	939
"	"	Mukhonja ..	"	10	789	1,086
"	"	Shitoto ..	"	15	1,175	1,020
"	"	Magui ..	"	10	1,627	760
"	"	Shivakala ..	1:2,500	13	2,058	1,198
"	"	Buyonga ..	"	11	1,265	780
"	"	Shinyalu ..	"	13	1,267	1,113
"	"	Lugovo ..	"	13	1,430	870
"	"	Shamberere ..	"	40	1,326	4,132
"	"	Shiswa ..	"	13	1,061	1,164
Eastern ..	Machakos ..	Embui ..	"	28	538	2,680
"	"	Mambiti ..	"	23	358	2,284
"	"	Mathunthini ..	"	19	594	1,786
Coast ..	Kwale ..	Bumbani "A" ..	"	25	808	2,627
Total ..				1,682	69,320	183,335

## (iv) Preliminary Index Diagrams

Uncontrolled Plane Table Survey at 1:5,000

Nil

## (v) Preliminary Index Diagrams—Re-done 1:2,500

Nil

## (c) Distribution Areas

Nil

1.2. RANGE LAND

<i>Province</i>	<i>District</i>	<i>Reg. Section</i>	<i>Scale</i>	<i>Sheets</i>	<i>Parcels</i>	<i>Hectares</i>	
Rift Valley	Kajiado	Olekasasi	1:50,000	1	6	774	
"	"	Rombo "B"	"	1	17	40,454	
"	"	Kimana/Tikondi	"	1	3	28,659	
"	Narok	Ewaso Ngiro	"	1	3	27,735	
"	"	Oletukat	"	1	4	13,927	
"	"	Suswa-Kitet	"	1	3	42,387	
"	"	Rotian	"	1	3	2,630	
"	"	Olombokishi	"	1	13	8,814	
"	"	Murua	"	1	2	2,178	
"	"	Oleleshwa	"	1	10	15,892	
"	"	Olkinyei	"	1	2	78,789	
Total				..	11	66	262,239