PART Ⅱ DETAILED REPORT

CHAPTER 1 GANZE AREA

1-1 Measures of Survey Works

Geological mapping and geochemical exploration works, covering an area of 192 sq. km, route-mapping of a 140 km extension in total and collecting 451 soil samples in total, were carried out in the field during the course of the current work programme.

Geological route mapping works were implemented by using topographical maps, 1 to 10,000 scale, which were exaggerated from topographical maps of 1 to 50,000 scale, published by the Survey of Kenya. Mapping routes for geology were allocated to establish effective and sufficient traverses against the major geological structure in the Area. Route mapping works were also associated with sampling of representative rock specimens and geological sketching or recording photographing of significant ore outcrops. The geological research results were comprehensively summarized in reference to the existing geological informations and the results of air-photo interpretations and etc., to produce the geological maps and geological cross-sections of 1 to 50,000 scale.

Field works of geochemical exploration research, which were carried out in simultaneous accordance with geological route mapping progresses, the above, were implemented by taking samples of B-horizon soils on ground surface at the stations of every 300 metres interval along the traversing direction against the major tectonic structure in the Area and of every 350 to 400 metres interval along the parallel direction against that, the above. The collected soil samples, air-dried then afterward in the base camp, were sieved to provide for minus 80-mesh fractional products to be sent to geochemical laboratory. Halves of each product were delivered to the Chemex Labs Limited, Vancouver, Canada for chemical assay and another halves are being kept in the storage in Mombasa Office, Mines and Geological Department of Kenya.

1-2 Results of Geological Research

1-2-1 General geology

Geological map and geological cross-sections in Ganze Area are shown in Figure II-1-1, representative geological profile is in Figure II-1-2, respectively.

General geology in the Area majorly consists of the sediments of Triassic and Jurassic ages, which are stratigraphically divided into Mazeras Formation, Kambe Formation and Mtomkuu Formation in ascending order from west to eastward in the Area.

(1) Mazeras Formation (Mzl, Mzm)

Mazeras Formation is widely extended in the Area to cover some 80 percent of the entire Area and majorly consists of terrestrial sandstone beds. Lower and Middle Members of the Formation, which are correlated to be of Triassic and Jurassic age, are distributed in the Area.
Lower Member (Mzl) shows pale grey and majorly consists of medium- to coarse-grained sandstone beds, rich in quartz. Cross laminas and grading structures are frequently observed.
Middle Member (Mzm) mainly consists of sandstone and siltstone (Mzm-St). Sandstone shows pale grey to pale yellow and is mainly composed of medium- to coarse-grained beds. It shows a some similar facies to the above Lower Member, being rich in quartz content and having cross lamina structure. Siltstone shows reddish brown to purplish with a granularity in the range of

silt to very fine sand.

(2) Kambe Formation (K)

Kambe Formation is distributed in eastern part of the Area to be extended north-south directionally showing a width of 1.5 to 2 kilometres. It is of marine sedimentary limestone beds of Jurassic age. It shows pale grey to dark grey with having oolitic structure of varied dimension in central to southern parts of the Area, while being fine-grained and massive in northern part. Fossils of some shell-fish are observed in several locations in the Area.

(3) Mtomkuu Formation (Mtl, Mtm)

Mtomkuu Formation shows a distribution of slender extension, north-south directional, in eastern margin of the Area. It mainly consists of shale beds and is subdivided to be of Lower (Mtl) and Middle (Mtm) Members in the Area. It conformably overlies Kambe Formation and is correlated to be of Jurassic age.

Lower Member (Mtl) is mainly composed of alterations of thin-bedded shale and sandstone, which are intercalated by thin limestone, limy sandstone and/or conglomerate beds. It is featured by showing a frequent facies change.

Middle Member (Mtm) mainly consists of pale-brown shale beds with a steady facies showing. Lamina structure and resultant fissility are well-developed in shale beds.

1-2-2 Geological structure

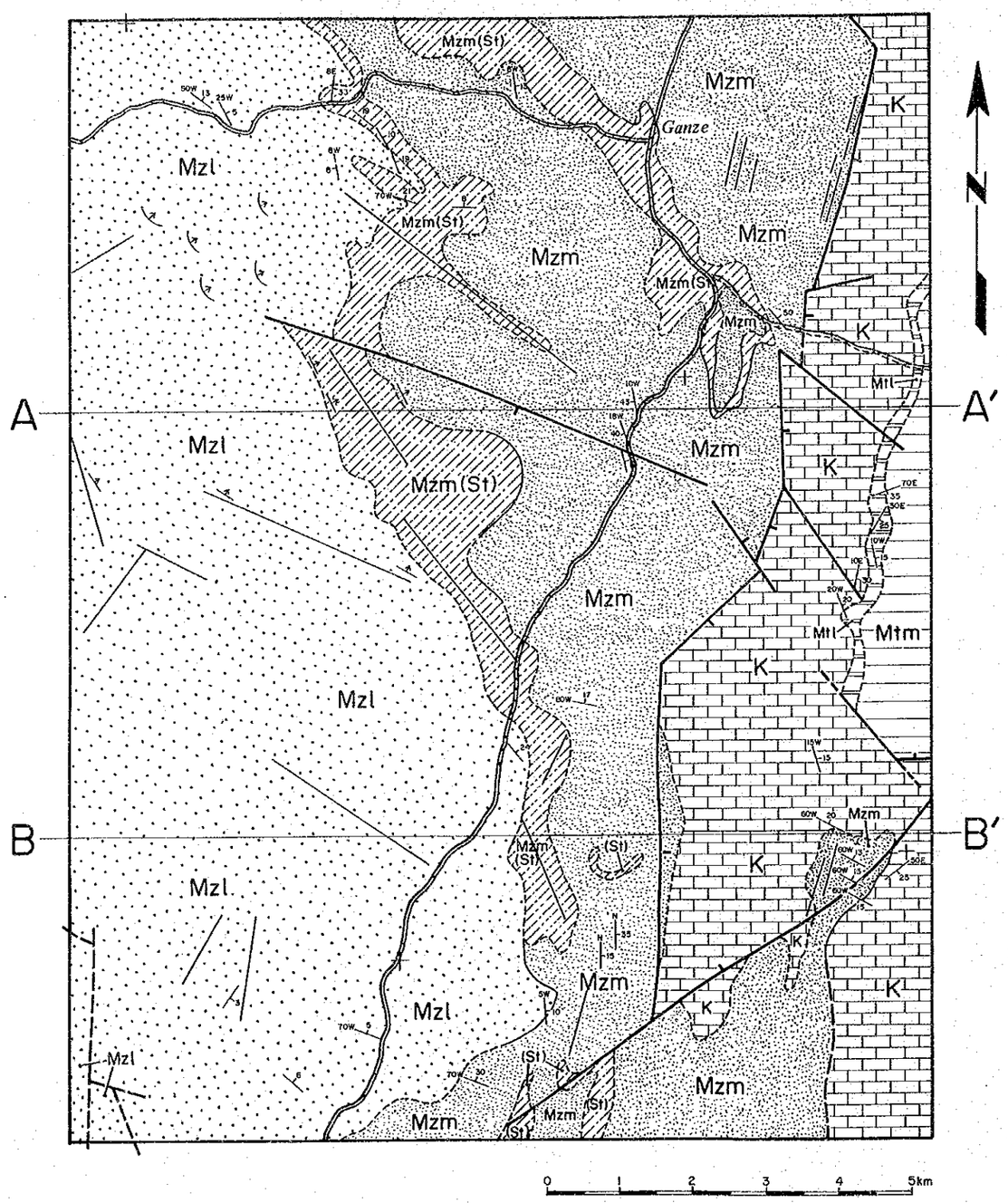
Sedimentary beds in the Area are piled up by showing a general strike of NNW-SSE to NNE-SSW and gently dipping with several to less than 30 degrees toward east, i.e., toward the coast in the Area. Some of sandstone beds in the Area are found to apparently show a different behaviour of occurrence from the general structure, however, it is still obsure that the difference might be naturally caused by faulting or folding or some geological malpractice resulted from an inevitable slip concerning to an interpretation of cross lamina and stratum bedding during the field working.

Normal faults, striking north-south approximately with dips easterly, are well-developed in the Area. A normal fault, which is considered to be a part of the major faults that widely run nearly parallel to the general trend of beds and to the sea shore line in the Area, defines a direct demarcation of Mazeras and Kambe Formations. The major faults are considered to be genetically closely related to the forming of lead-zinc-barite ore vein mineralization in the Area. The major faults, the above, are dislocated by other faults system of later stage, NE-SW and NW-SE trends.

1-2-3 Ore showing and mineralized zone

The localities of mineral occurrences in the Area are shown in PL.5.

Any of the remarkable ore showing has never been recognized yet in the Area. Some floats of barite ore were found by the current work in the vicinity of the grid station 577-9601 on Topographical Map "Bamba", 1 : 50,000 scale, around where a north-south trending fault, that makes a demarcation of Mazeras and Kambe Formations, has been mapped up. This suggests a possibility of an occurrence of lead-zinc-barite ore vein mineralization, genetically



LEGEND

CRETACEOUS	Mtu	Upper Member	MTOMKUU FORMATION (Mt)	Shales,subordinate limestones,l
	Mtm	Middle Member		Shales,subordinate limestones,l
	Mtl	Lower Member		Shales/siltstones/sandstones/limestones Sandstone,s; limestones,l
JURASSIC	K		KAMBE FORMATION	Limestones,(coral-rich,c; oolitic/pisolitic,o) subordinate shales/siltstones/sandstones
	Mzu	Upper Member	MAZERAS FORMATION (Mz)	Sandstones/arkoses
	Mzm	Middle Member		Sandstones/arkoses (Shales/siltstones/sandstones,St)
	Mzl	Lower Member		Sandstones/arkoses
TRIASSIC	Mku	Upper Member	MARIAKANI FORMATION (Mk)	Sandstones (Shales/siltstones/sandstones,St)
	Mkm	Middle Member		Sandstones
	Mkl	Lower Member		Sandstones

DURUMA GROUP

- Geological boundary, known
- Geological boundary, approximate (including photo-interpretation)
- Geological boundary, inferred
- Photo-lineament
- Fault, downthrow indicated
- Fault inferred, downthrow indicated
- Breccia, shear zone
- Bedding, dip indicated
- Bedding, dip (<15°) indicated (air-photo interpretation)
- Bedding, flat-lying
- ●Fe Mineral occurrence
- Mine, working
- A——A' Line of section

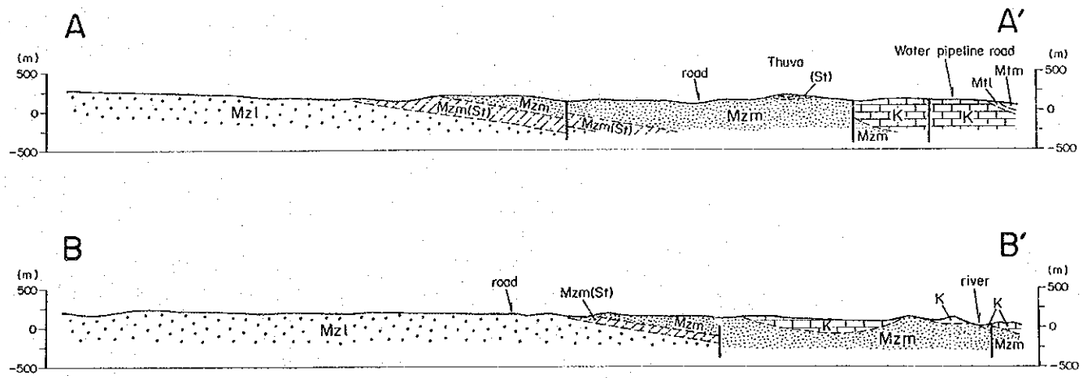
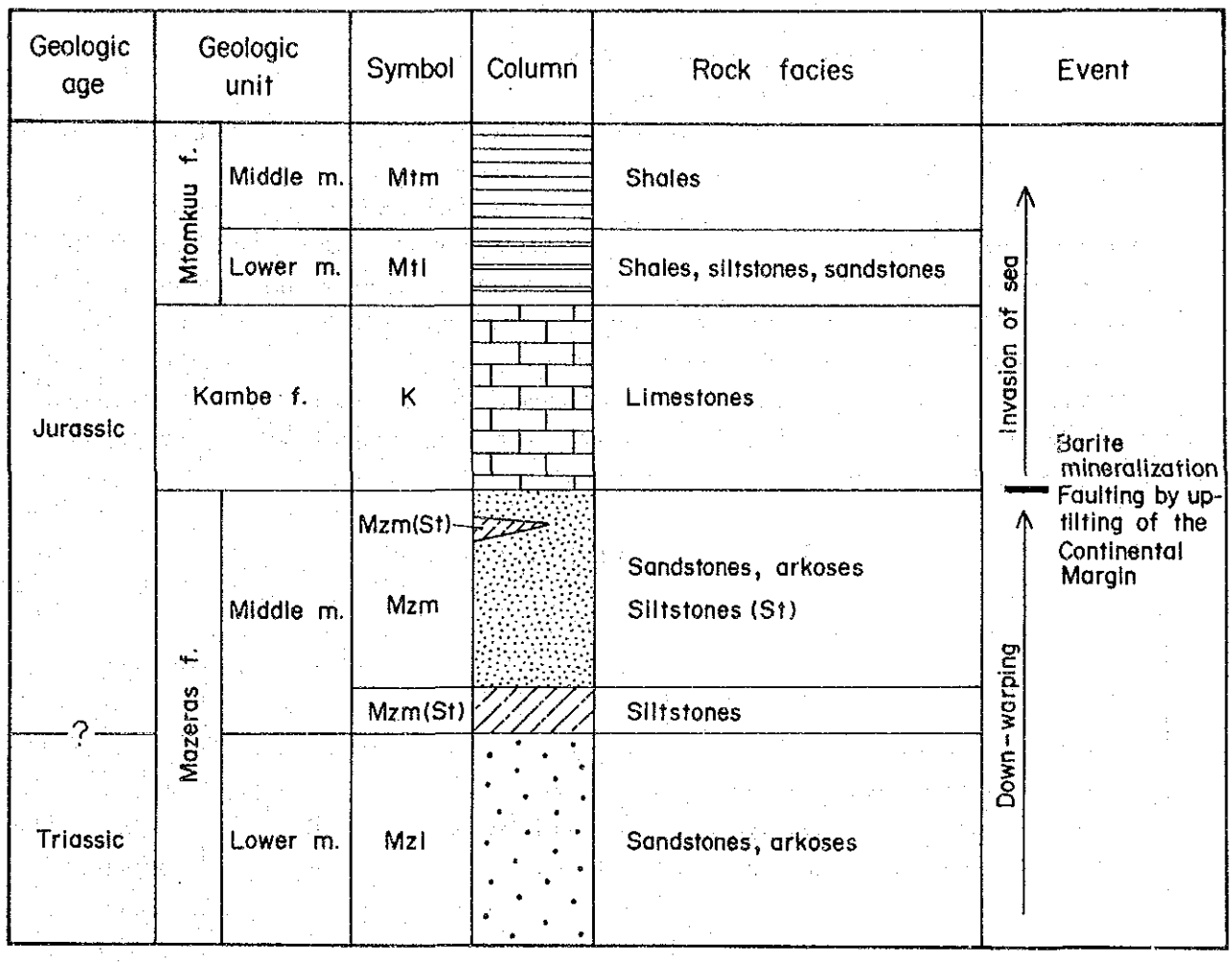


Figure II–1–1 Geological Map of the Ganze Area



f. : formation m. : member

Figure II-1-2 Generalized Geological Columnar Section of the Ganze Area

closely related to the north-south trending fault. Ferruginous and ferro-manganese concretions are observed in several locations in Kambe-Formation-covering area. These concretions are considered to have been formed by concentration/consolidation of iron and manganese in connection with weathering and/or terra rossa forming of limestone beds.

1-3 Results of Geochemical Exploration Research

1-3-1 Chemical analysis and interpretation

The respective chemically analyzed elements, chemical analysis methods and detection limits of the elements by the current work are shown in Table II-1-1.

The univariate analysis and principal component analysis were implemented. The total of 793 soil samples from Ganze, Jibana and Ribe Areas were used to form a population for the interpretations. This is based on that the above three Areas are under a similar geological situation and an identical type of mineralization is targeted among them to lead to establish a significant future potential examination in overall categories. The values less than the detection limit were then treated as zero content for the current statistics. The values, which were designated by the laboratory to be more than the upper limit, were then treated by using the upper limit value itself for the respective element contents.

Table II-1-1 Analytical Procedures

Element	Unit	Description	Method	Detection Limit	Upper Limit
Au	ppb	Fuse 30 g sample	FA-NAA	1	10000
Ag	ppm	Nitric aqua regia digest	AAS-BKGD CORR	0.2	100.0
Cu	ppm	Nitric aqua regia digest	ICP-AES	1	10000
Pb	ppm	〃	〃	2	10000
Zn	ppm	〃	〃	2	10000
Mn	ppm	〃	〃	5	10000
Ba	ppm	〃	〃	10	10000
Fe	%	〃	〃	0.01	15.00
As	ppm	〃	〃	5	10000
Hg	ppm	〃	〃	1	10000
S	%	Leco induction turnance	Leco-IR detector	0.001	100.0

FA-NAA : Fire Assay-Neutron Activation Analysis
AAS : Atomic Absorption Spectrometry
ICP-AES : Inductively Coupled Plasma-Atomic Emission Spectrometry

1-3-2 Univariate analysis

(1) Standard statistic values

Standard statistic values in the Area are shown in Table II-1-2.

(2) Determinations of cumulative frequency distribution and threshold value

Threshold values were determined by the following criteria.

Criterion 1 : The cumulative frequency distribution of the composite population, i.e., geochemical anomaly plus background values, is partitioned into the cumulative frequency distribution of two single populations or more, then threshold values are determined by an establishment of the comparison and the collation between the composite standard curve and the obtained chemical values.

Criterion 2 : The $m + 2\sigma$ value,

where, m : average of chemical assay values,

σ : standard deviation

is determined to be of the threshold value in the occasion that the cumulative frequency curve shows linear and the partition into single populations is hardly made.

Criterion 3 : In the occasion of the element, when the most part of range of the assay values of the above element is shown by being under the detection limit, then the threshold value is determined by designating the minimum value among the high-content population of the element, which occupies a 2.27 percent among the entire number of samples. The 2.27 percent value itself designates the ratio of number of samples among that of samples, which shows the value of more than $2m + 2\sigma$ in the normal population.

Cumulative frequency distribution diagram and the subsequent diagram, in which single populations are partitioned, are shown in Figure II-1-3. Table II-1-3 shows the threshold values and the applied criteria to determine the values.

1-3-3 Principal component analysis

(1) Correlation of pathfinders

Table II-1-4 shows the summary of correlation coefficients of the elements.

Every correlation coefficient shows a positive feature. The correlations of iron-copper, iron-zinc, iron-manganese, zinc-copper and zinc-manganese, with respective coefficients of more than 0.77, are clearly shown particularly.

(2) Principal component analysis

The results of principal component analysis are shown in Table II-1-5.

Seven elements, such as copper, lead, zinc, barium manganese, iron and arsenic provide particularly high contribution ratios for the first principal component, while, copper, zinc, manganese and iron are particularly high.

The first principal component is estimated in general by an examination of the distribu-

Table II-1-2 Statistics of Geochemical Data

— Ganze, Jibana and Ribe Area —

Element	Unit	Number of Samples	※	Mad.	Min.	Mean (m)	Standard Deviation (σ)	m + 2σ
Au	ppb	793	781	8	< 1	—	—	—
Ag	ppm	〃	787	3.4	< 0.2	—	—	—
Cu	〃	〃	84	88	< 1	5.0	0.523	55.8
Pb	〃	〃	58	2420	< 2	12.3	0.393	74.8
Zn	〃	〃	21	2110	< 2	17.5	0.610	290.1
Ba	〃	〃	37	5510	< 10	83.7	0.544	1023.0
Mn	〃	〃	4	> 10000	< 5	383.1	0.670	8372.1
Fe	%	〃	0	> 15.00	0.04	1.528	0.438	11.493
As	ppm	〃	418	200	< 5	9.3	0.271	32.3
Hg	〃	〃	758	5	< 1	—	—	—
S	%	〃	371	1.340	< 0.001	0.0044	0.387	0.0263

※ Number of Samples Under Detection Limit

Table II-1-3 Thresholds and Number of Anomalous Samples

— Ganze, Jibana and Ribe Area —

Element	Threshold	Number of Samples	Ratio %	Applied Criterion
Au	1 ppb	12	1.5	3
Ag	0.2 ppb	6	0.8	3
Cu	66 ppm	17	2.1	1
Pb	80 ppm	23	2.9	1
Zn	600 ppm	11	1.4	1
Ba	1100 ppm	21	2.6	1
Mn	8372 ppm	11	1.4	2
Fe	8 %	25	3.2	1
As	65 ppm	3	0.4	1
Hg	1 ppm	35	4.4	3
S	0.025 %	17	2.1	1

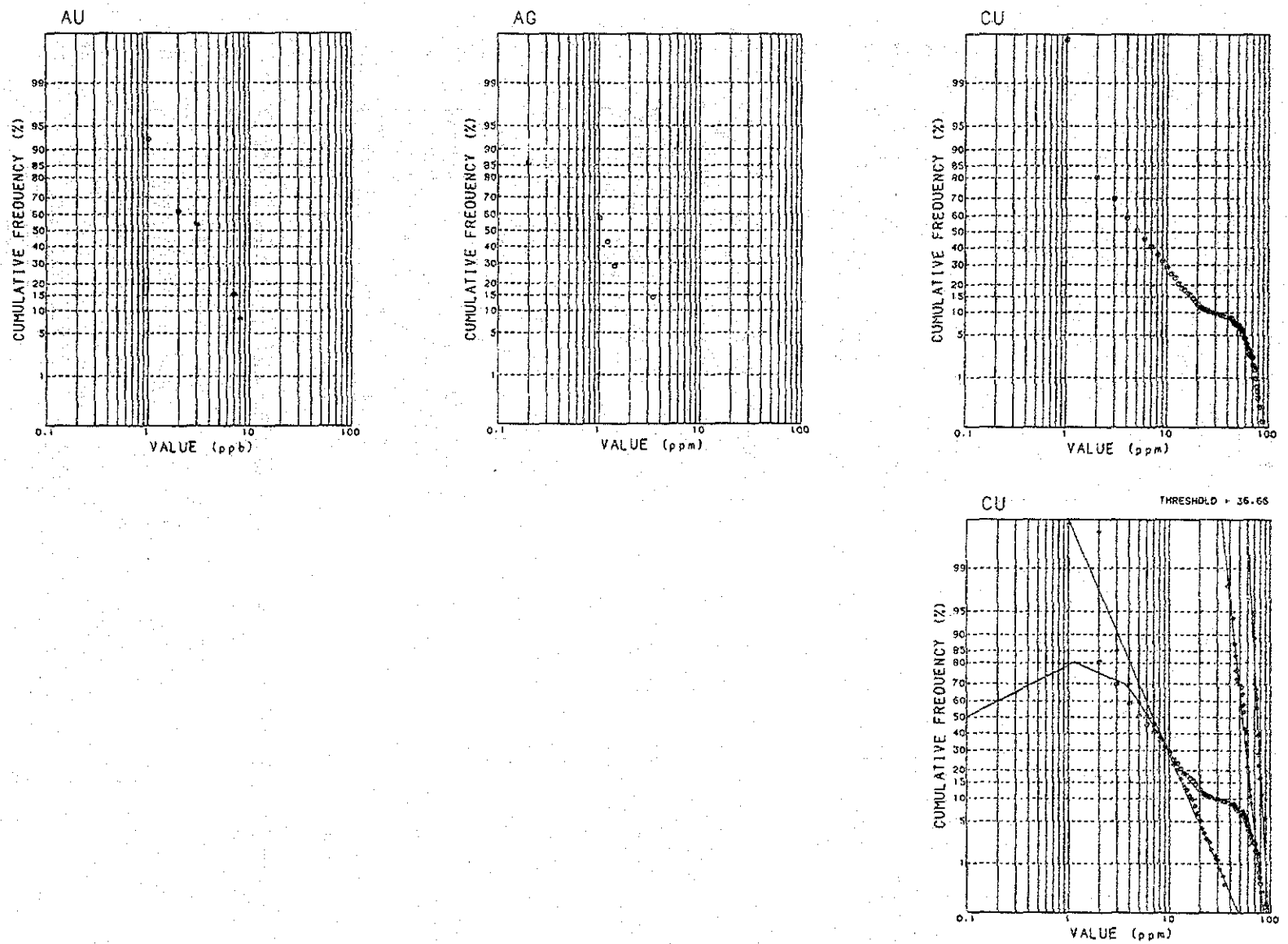


Figure II–1–3 (1) Cumulative Frequency Curves and Partition of Populations, Ganze, Jibana and Ribe Area

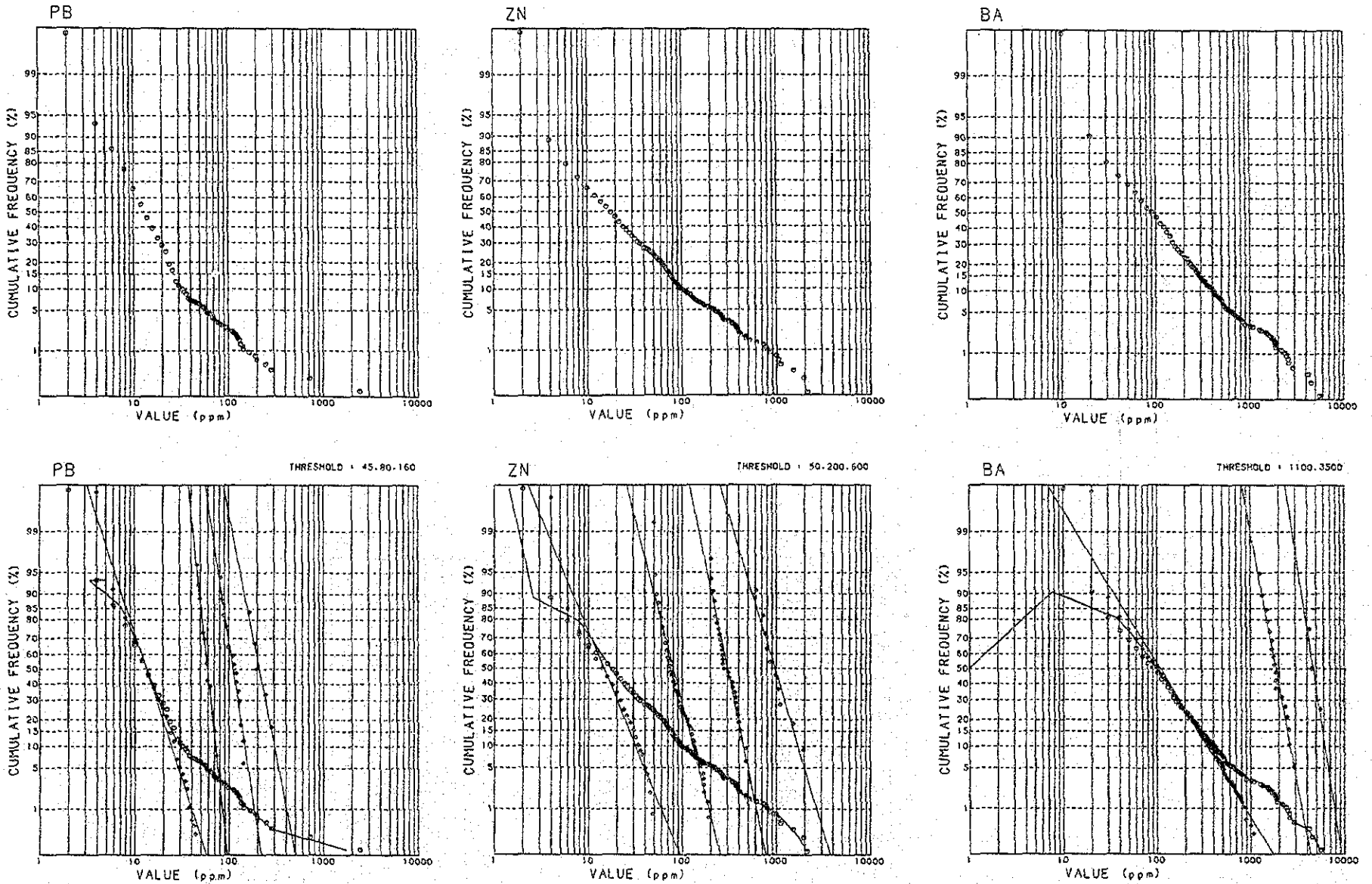


Figure II–1–3 (2) Cumulative Frequency Curves and Partition of Populations, Ganze, Jibana and Ribe Area

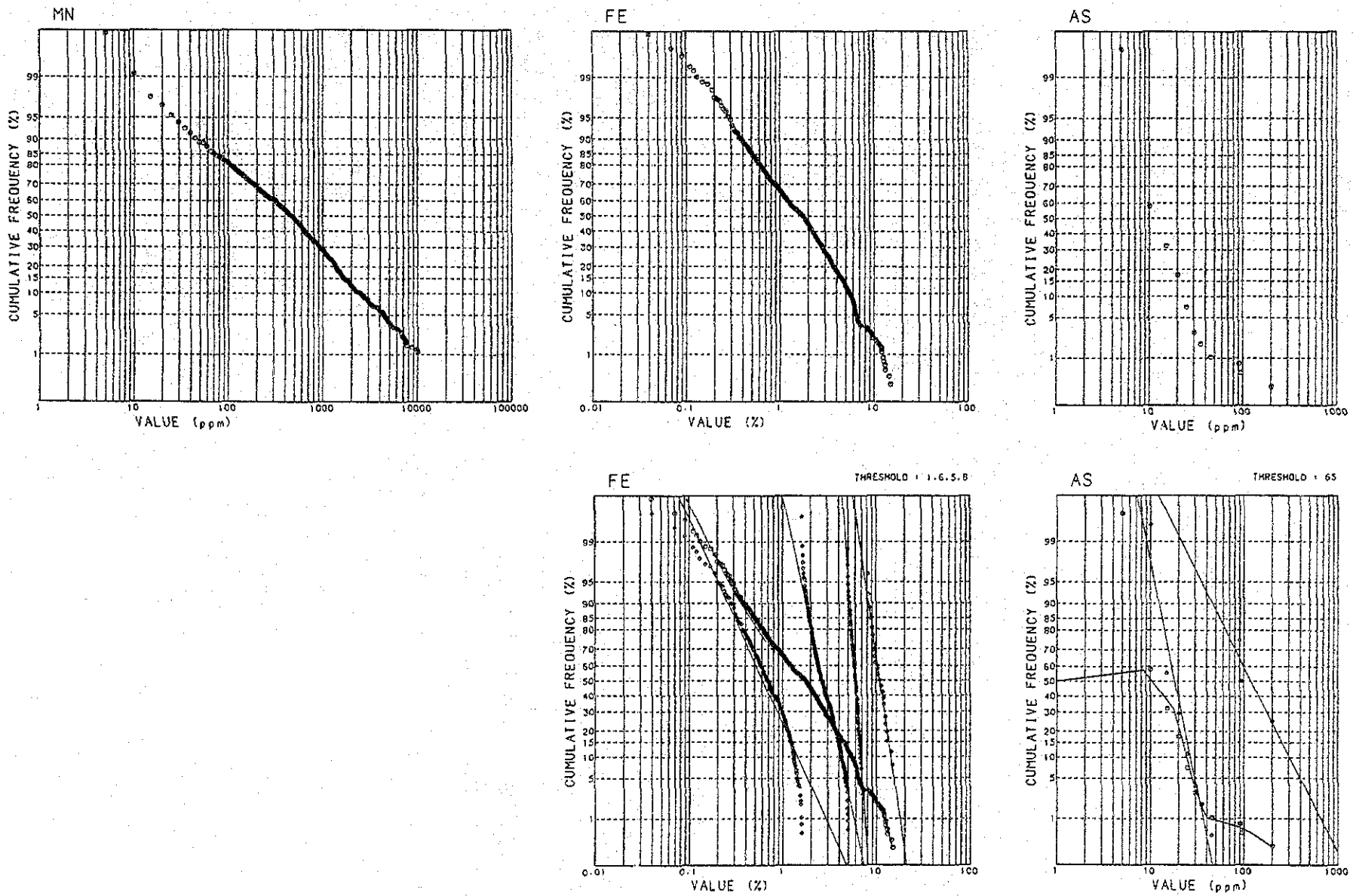


Figure II–1–3 (3) Cumulative Frequency Curves and Partition of Populations, Ganze, Jibana and Ribe Area

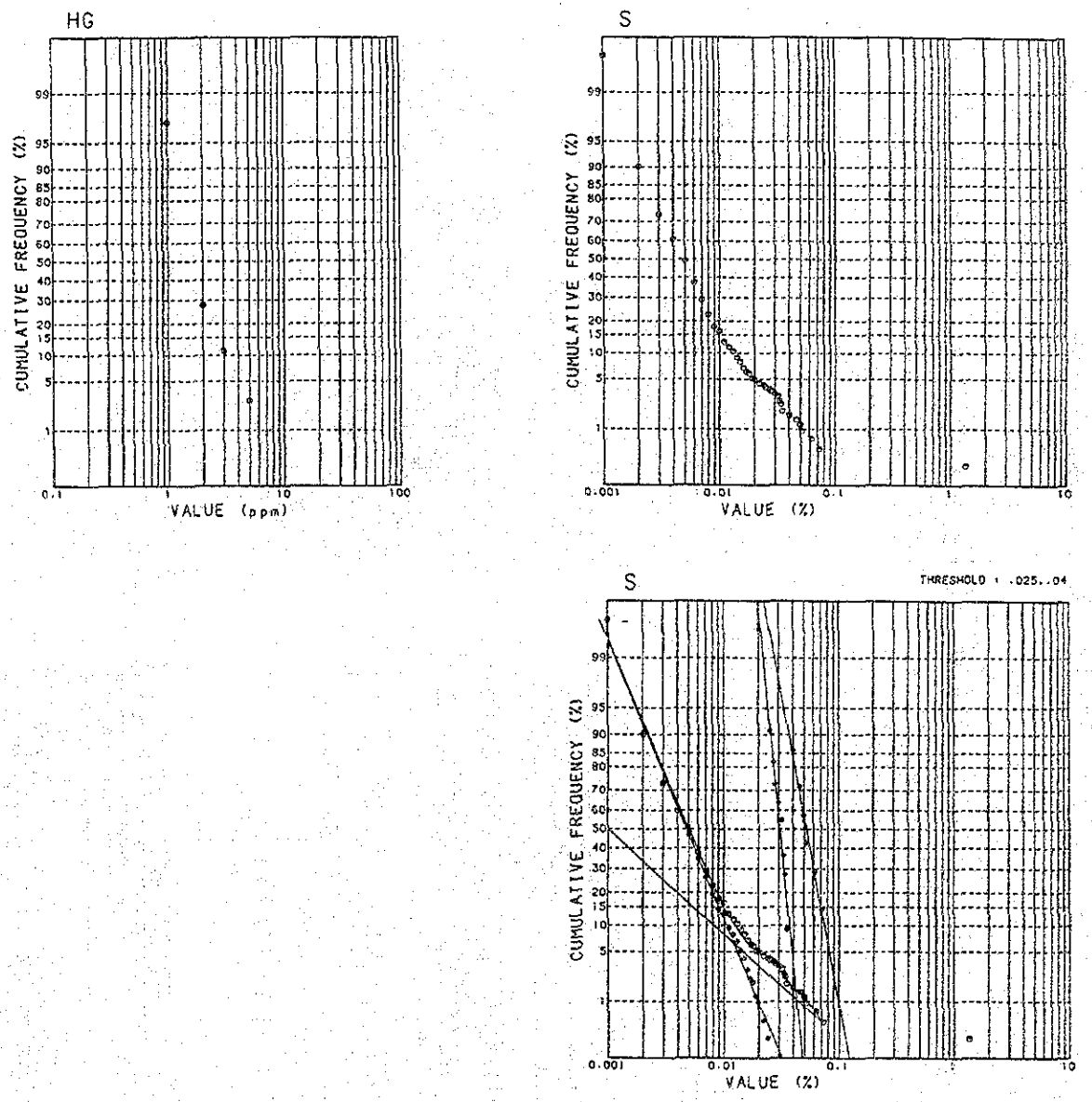


Figure II–1–3 (4) Cumulative Frequency Curves and Partition of Populations, Ganze, Jibana and Ribe Area

Table II-1-4 Correlation Coeficients-Ganze, Jibana and Ribe Area

	Au	Ba	Cu	Fe	Mn	P	Pb	Sr	Zn
Au	---	85	85	85	85	85	83	85	84
Ba	0.670	---	261	262	262	262	259	262	260
Cu	0.052	0.712	---	261	261	261	258	261	260
Fe	0.384	0.788	0.910	---	262	262	259	262	260
Mn	0.614	0.805	0.716	0.793	---	262	259	262	260
P	0.356	0.799	0.817	0.856	0.831	---	259	262	260
Pb	0.727	0.664	0.258	0.429	0.582	0.435	---	259	258
Sr	0.513	0.910	0.791	0.823	0.839	0.848	0.577	---	260
Zn	0.725	0.905	0.728	0.845	0.839	0.857	0.689	0.884	---

Right upper : Number of samples calculated
Left bottom : Correlation coeficients

Table II-1-5 Summary of Principal Component Analysis
— Ganze, Jibana and Ribe Area —

PRIN COMP	EIGEN VALUE	CONTRIB	CUM CONTRIB		As	Ba	Cu	Fe	Mn	Pb	Zn	S
P 1	4.292	0.536	0.536	EIGENVECTOR	.306	.283	.392	.455	.390	.290	.447	.171
				FACTOR LOADING	.633	.585	.813	.943	.808	.601	.927	.354
				CONTRIBUTION	.401	.343	.660	.889	.654	.362	.858	.125
P 2	1.241	0.155	0.692	EIGENVECTOR	-.195	.538	-.146	-.153	-.190	.256	-.191	.700
				FACTOR LOADING	-.217	.599	-.163	-.170	-.212	.285	-.212	.780
				CONTRIBUTION	.047	.359	.026	.029	.045	.081	.045	.608
P 3	0.825	0.103	0.795	EIGENVECTOR	-.343	-.012	-.413	-.036	.288	.710	.061	-.345
				FACTOR LOADING	-.312	-.011	-.375	-.033	.261	.645	.056	-.314
				CONTRIBUTION	.097	.000	.141	.001	.068	.416	.003	.098
P 4	0.689	0.086	0.881	EIGENVECTOR	.741	-.385	-.317	-.097	-.139	.338	-.073	.233
				FACTOR LOADING	.615	-.319	-.263	-.081	-.115	.281	-.061	.194
				CONTRIBUTION	.378	.102	.069	.006	.013	.079	.004	.037
P 5	0.431	0.054	0.935	EIGENVECTOR	.365	.622	-.009	-.042	-.404	.083	-.083	-.549
				FACTOR LOADING	.240	.408	-.006	-.027	-.265	.054	-.055	-.361
				CONTRIBUTION	.057	.167	.000	.001	.070	.003	.003	.130
P 6	0.320	0.040	0.975	EIGENVECTOR	.240	.304	-.466	-.091	.657	-.407	-.165	-.001
				FACTOR LOADING	.136	.172	-.263	-.051	.372	-.230	-.093	-.001
				CONTRIBUTION	.018	.030	.069	.003	.138	.053	.009	.000
P 7	0.108	0.014	0.988	EIGENVECTOR	.045	-.057	.378	.212	.222	.204	-.844	-.063
				FACTOR LOADING	.015	-.019	.124	.070	.073	.067	-.278	-.021
				CONTRIBUTION	.000	.000	.015	.005	.005	.005	.077	.000
P 8	0.094	0.012	1.000	EIGENVECTOR	.098	.022	.440	-.839	.255	.133	.091	-.035
				FACTOR LOADING	.030	.007	.135	-.257	.078	.041	.028	-.011
				CONTRIBUTION	.001	.000	.018	.066	.006	.002	.001	.000

tions of anomalous values to represent a concentration of metallic elements, such as the showings of the concentration of heavy metallic elements in weathered soils of Kambe and Mtomkuu Formations.

The second principal component is highly contributed by sulphur and barium and is possibly estimated to be related to the mineralization associated with barite.

The third principal component is highly contributed by lead and the fourth principal compent is by arsenic, respectively.

The cumulative contribution ratio of the first principal component through the fourth reaches to be of 88 percent.

The scores of the third principal component for every sample were examined to estimate a possibility of an influence of lead-zinc mineralization. However, the third principal component is considered to be irrelative to the mineralization because that the samples with high scores of the above component were found to be commonly distributed to the group of the Lower Member of Mazeras Formation (Mzl) in Ganze Area.

1-3-4 Interpretations of geochemical anomalies

The localities of geochemical anomalies in the Area are shown in PL.7, PL.8 and PL.13.

The geochemical general characteristics of respective pathfinders examined by the current works are stated below:

Gold : Gold is estimated to be irrelative to the mineralization in the Area by showing a generally scattered distribution of anomalous zones formed by five specimens with a low content of gold, 8 ppb the highest.

Silver : Anomalous value of silver is not observed in the Area.

Copper : Anomalous values of copper, 48 ppm the highest, are observed in three specimens, scatteredly distributed in the area covered by Kambe Formation. Copper is estimated to be concentrated in weathered soils of limestone beds.

Lead : Anomalous values of lead are observed in four specimens with the value of 190 ppm the highest. No distribution is pointed out to be designated as an anomalous zone.

Zinc : Anomalous values of zinc, 1,515 ppm the highest, considered to be concentrated in weathered soils of limestone beds, are observed in eight specimens totally collected from the area covered by Kambe Formation.

Barium : Anomalous values of barium, 4,470 ppm the highest, are observed scatteredly in the specimens collected from the area covered by the Middle Member of Mazeras Formation. A barium content in soils nearby the location, from where barite vein ore floats were collected, reaches to an anomalous value of 2,350 ppm.

Manganese : Manganese forms clear anomalous zones in northern region in the Areas covered by Kambe Formation with the highest content value of more than 10,000 ppm. Seven specimens out of 11 with manganese-anomalous values, collected from three areas, Ganze, Jibana and Ribe, are swallowed in the above anomalous zones. The zones extend more than 3 km long, north-southerly, 400 to 700 metres wide. Manganese is estimated to be concentrated in weathered soils of limestone beds.

Iron : Iron shows a similar behaviour to manganese to form anomalous zones in northern half of the region, covered by Kambe Formation, extending about 5 km long north-southerly and about 200 to 700 metres wide. Iron is estimated to be concentrated in weathered soils of limestone beds, with the highest content value of 15 percent.

Arsenic : Anomalous values of arsenic are shown by ten specimens. Eight specimen out of those are from the region covered by Kambe Formation. Anomalous zones are scatteredly distributed.

Mercury : Anomalous values of mercury, 1 ppm each, are shown by 11 specimens. Most of anomalous zones are scatteredly distributed in the region covered by Mazeras Formation.

Sulphur : Anomalous values of sulphur, 1.34 percent the highest, are shown by ten specimens from the region mostly covered by the Middle Member of Mazeras Formation. Anomalous zones are scatteredly distributed. Anomalous zones of sulphur, represented by eight specimens are overlapped by those of barium. Those are considered to be possibly genetically formed in relation to the in-situ occurrence of mineralization associated with barite, since the overlapped anomalous values were obtained in soil specimens nearby the location, where barite vein ore floats are observed.

1-4 Interpretation

1-4-1 Mineral potential

Since the north-southerly faults, which provide the direct demarcations of Mazeras and Kambe Formations, and NNE-SSW-directional faults are well-developed in the Area, a potential of lead-zinc-barite vein ore mineralization in Mazeras Formation has long been expected, however, barite vein ore floats were found by the current reconnaissance work limitedly in one location in the Area. The chemical anomalous zones, overlapped by barium- and sulphur-anomalous values, which may foster an expectation of an occurrence of barite ore mineralization, have been found by the current geochemical research work, however, those are scatteredly observed in the Area and are considered to provide an uncertain relation to the other type of mineralization of heavy metallic elements. Those may unlikely lead to a concept that encourages a possibly high mineral potential for future considerations in Ganze Area in comparisons with

those in Jibana and Ribe Areas.

1-4-2 Results of geochemical research works and mineralized zone

Geochemical anomalous zones of significance, assembled by the major anomalous values in the Area, are represented by three elements, such as zinc, iron and manganese, which provide a mutually close correlation. Those anomalous zones are overlappedly observed in northern half of the region, which is occupied by Kambe Formation. Those anomalous zones are superimposed by occurrences of ferruginous concretions in weathered soils of limestone beds. Heavy metallic elements are estimated to have been adsorbed/concentrated to form ferruginous concretions.

Geochemical anomalous zones of barium and sulphur in overlapped manner, which may be suggestive of an occurrence of barite ore mineralization, are scatteredly observed in the region, which is occupied by Mazeras Formation. Those zones carry a lack of mineral showing of other type on ground surface to unlikely lead to an encouragedly fostering concept for future consideration of exploration programme.

1-4-3 Future work programme

Positive envisions on a concept of potential of lead-zinc-barite veins ore mineralization in the Area has not yet been established by the current geological reconnaissance and geochemical research works. Ganze Area is evaluated to be unlikely deserved for further future exploration programme.

CHAPTER 2 JIBANA AREA

2-1 Measures of Survey Works

Geological mapping and geochemical exploration works, covering an area of 100 sq. km, route-mapping of a 80.8 km extension in total and collecting 260 soil samples in total, were carried out in the field during the course of the current work programme. Measures of the survey works are identical with that in Ganze Area.

2-2 Results of Geological Research

2-2-1 General geology

Geological map and geological cross-sections in Jibana Area are shown in Figure II-2-1, representative geological profile is in Figure II-2-2, respectively.

General geology in the Area majorly consists of the sediments of Triassic to Cretaceous ages, which are stratigraphically divided into Mariakani Formation, Mazeras Formation, Kambe Formation and Mtomkuu Formation in ascending order from west to eastward in the Area. These Formations are extendedly distributed north-south directionally along the sea shore line in the Area.

(1) Mariakani Formation (Mku)

The Upper Member of Mariakani Formation is observed in the Area. The Member is distributed in western part of the Area, extending north-south directionally with a width of 2 to 3 km and having a contact to the overlying Mazeras Formation by a possible fault. The Member majorly consists of sandstone and siltstone (Mku-St) beds. Sandstone shows pale grey to grey, fine- to coarse-grained with a local development of cross-lamina-dominated and micaceous facies, however, the former is less distinguished than that in the Mazeras Formation. Siltstone is distributed in south-western end of the Area, however, the facies is still inevitably obscure in details under a limited progress schedule of the investigation work in the Area. The Member is correlated to be of Triassic age.

(2) Mazeras Formation (Mzm, Mzu)

The Middle and Upper Members of Mazeras Formation are observed in the Area, being majorly comprised of the Middle Member, which is locally overlain by the Upper Member in higher portions in altitude in the Area. The Formation is extendedly observed in central part of the Area, north-south directionally, approximately 2.5 to 4 kim wide, and has a contact by a fault to the underlying Marikani Formation and the overlying Kambe Formation.

Middle Member (Mzm) of Mazeras Formation is mainly composed of sandstone and siltstone (Mzm-St) beds. Sandstone shows pale grey to grey, coarse-grained and is dominated by cross-lamina textures. It is frequently rich in quartz content with having mudstone pebbles inclusions. It yields petrified woods in the upper most horizon of the Member in the vicinity of Kinango Hill. Several beds of siltstone (Mzm-St) are observed along the National Road near Chasimba Hill in northern part of the Area, being greenish grey to bluish grey, very soft and brittle and several to several tens metres thick. Couples of relatively thicker beds are properly shown in the attached Geological Map. None of the occurrences of siltstone beds is known in

central to southern parts of the Area.

Upper Member (Mzu) of Mazeras Formation is locally distributed in topographically high portions in the Area, i.e., in Kinango Hill, Kia Hill and etc.. It shows a greyish white and coarse-grained sandstone beds occurrence in Kinango Hill.

(3) Kambe Formation (K)

Kambe Formation is composed of marine limestone beds, extended north-southerly. It is wider in north-eastern part of the Area, more than 4 km wide east-westerly than in southern part, less than 1 km wide. Limestone shows pale grey to grey, mainly being clastic or having an oolitic texture in central to northern parts of the Area and occasionally yields coral fossils. Limestone in southern part of the Area is mainly fine-grained and massive with a lack of showing of oolitic texture.

(4) Mtomkuu Formation (Mtl, Mtm, Mtu)

Mtomkuu Formation is distributed in eastern part of the Area, extended NNE-SSW directionally, and is divided into Lower, Middle and Upper Members in ascending order from west to eastward in the Area.

Lower Member (Mtl) of Mtomkuu Formation is only observed in a extendedly zonal form of distribution of weathered floats, pale brown, in the Area to lead to an uncertainty whether having a similar occurrence to that in Ganze Area of a pile of sandstone and shale alternations.

Middle Member (Mtm) of Mtomkuu Formation in the Area is mainly composed of pale greenish grey shale beds, partly intercalated by very fine-grained sandstone beds. Shale beds of the Member are distinguishedly fissil, soft and brittle.

Upper Member (Mtu) of Mtomkuu Formation is locally distributed in south-eastern end of the Area. The Member is to be mainly composed of shale beds, associated with limestone beds intercalations, after the existing geological informations, however, the facies confirmations by the current works are not established under a limited progress schedule.

2-2-2 Geological structure

The sediments in the Area is mainly distributed to show a general strike of NW-SE to NNE-SSW, mainly gently dipping 10 to 20 degrees toward the coastal line in the east. Faults, mainly north-southerly, which frequently provide geological direct contacts to Mariakani, Mazeras and Kambe Formations, are abundantly estimated in the Area. A distinctive development of NNW-SSE-directional faults is represented by an interpretation of air photographs.

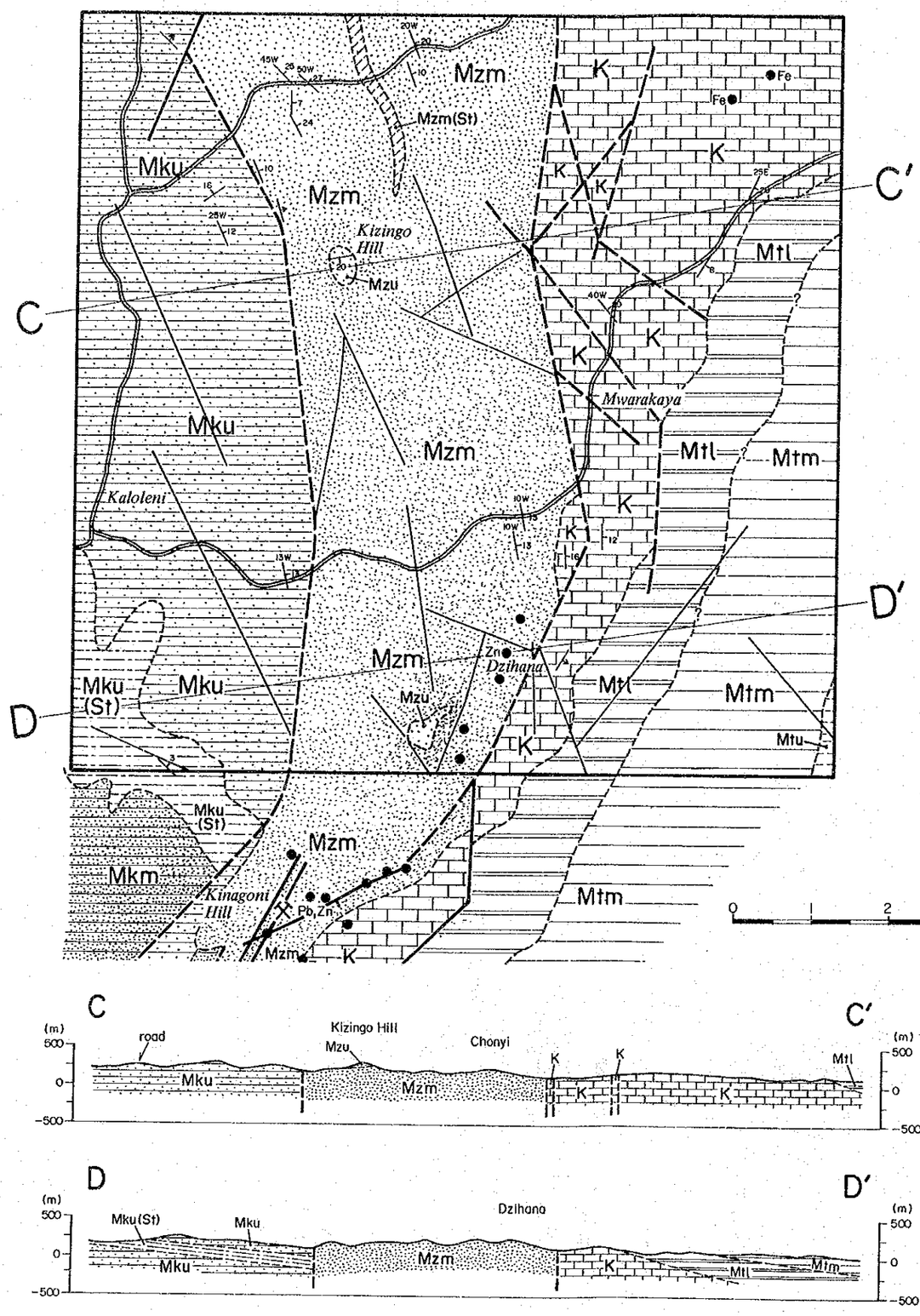
2-2-3 Ore showing and mineralized zone

The localities of mineral occurrences in the Area are shown in PL.5.

Geological field research and ore sampling for chemical assay for the mineralized zones reported in the existing data were carried out by the current programme.

(1) Jibana Mineralized Zone

Several occurrences of gossanous materials have been reported on eastern hill slopes, underlain by the Middle Member (Mzm) of Mazeras Formation, westward from Jibana



LEGEND

CRETACEOUS	Mtu	Upper Member	MTOMKUU FORMATION (Mt)	Shales,subordinate limestones,l
	Mtm	Middle Member		Shales,subordinate limestones,l
	Mtl	Lower Member		Shales/siltstones/sandstones/limestones Sandstone,s; limestones,l
JURASSIC	K		KAMBE FORMATION	Limestones,(coral-rich,c; oolitic/pisolitic,o) subordinate shales/siltstones/sandstones
	Mzu	Upper Member	MAZERAS FORMATION (Mz)	Sandstones/arkoses
	Mzm	Middle Member		Sandstones/arkoses (Slates/siltstones/sandstones,St)
	Mzl	Lower Member		Sandstones/arkoses
TRIASSIC	Mku	Upper Member	MARIAKANI FORMATION (Mk)	Sandstones (Shales/siltstones/sandstones,St)
	Mkm	Middle Member		Sandstones
	Mkl	Lower Member		Sandstones

DURUMA GROUP

- Geological boundary, known
- Geological boundary, approximate (including photo-interpretation)
- Geological boundary, inferred
- Photo-lineament
- Fault, downthrow indicated
- Fault inferred, downthrow indicated
- Breccia, shear zone
- 10 Bedding, dip indicated
- Bedding, dip (<15°) indicated (air-photo interpretation)
- Bedding, flat-lying
- Fe Mineral occurrence
- Mine, working
- A——A' Line of section

Figure II--2--1 Geological Map of the Jibana Area

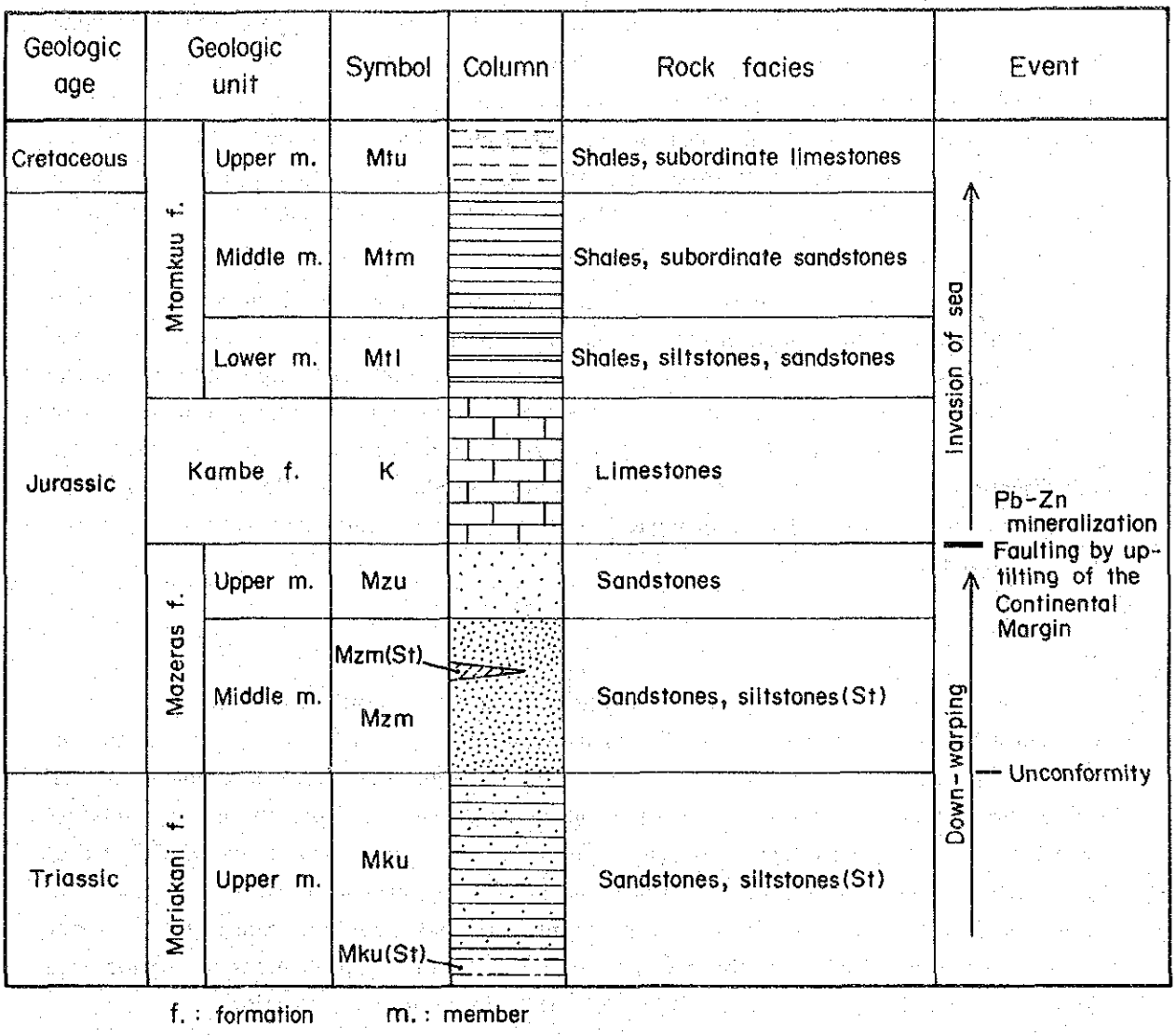


Figure II-2-2 Generalized Geological Columnar Section of the Jibana Area

(Dzihama) Village in centrally-southern part of the Area. The gossanous materials are observed by the current work to mainly form a floats zone, limonite-stained, in sandstone beds of the Middle Member of Mazeras Formation, with quite few ore outcrop. The gossanous floats zone is discontinuously extended for some 2.0 km long and some 100 metres wide in maximum in the area NNE-SSW directionally. This mineralized zone is referred as "Jibana Mineralized Zone" by the current work. Weak silicification and argillization by a hydrothermal alteration are observed in gossanous sandstone to be resulted in showing a secondary precipitation of silica that covers sand grains and argillization of feldspar to produce a development of leached cavities. Dickite and sericite have been identified in argillized sandstone by X-ray diffraction examination.

Figure II-2-3 shows the geographical location of the Zone, Table II-2-1 shows the chemical assay results of collected specimens from the Zone, respectively. Any concentration of precious and base metals is unobserved concerning to any specimen collected on ground surface. The Jabina Mineral Zone , located 300 to 400 metres apart westward directly from the major fault, which provides a direct contact to Kambe and Mazeras Formations and runs parallel to the direction of coastal line in the Area, is possibly considered to be allocated in relation to a fault activity, which provide a geological control of a significant genesis of lead-zinc-barite vein ore mineralization.

(2) Others

An occurrence of ferruginous concretions, which are considered to be formed by a concentration of iron in soils of weathered limestone beds, is observed in superficial soils of Kambe Formation in eastern end of the Area. A chemical value of a concretion, sample-numbered A005, shows 27.3 percent of iron, 0.354 percent of manganese, 0.122 percent of lead and 0.094 percent of zinc. Concentration of manganese, lead and zinc is shown in accordance with that of iron. The spot was ever pointed out to be a chemical anomalous zone of significance related to lead and zinc. It is also considered by the current work that a concentration of lead and zinc in the spot is possibly caused by a concentration of heavy metal elements in relation to a forming of ferruginous concretions and may not be by a vein ore mineralization.

2-3 Results of Geochemical Exploration Research

2-3-1 Chemical analysis and interpretation

Chemical analysis and interpretation in Jibana Area were implemented by the identical measures with those in Ganze Area.

2-3-2 Interpretations of geochemical anomalies

The localities of geochemical anomalies in the Area are shown in PL.7, PL.8 and PL.13.

The geochemical general characteristics of respective pathfinders examined by the current works are stated below:

Gold : Six samples in the Area are counted for being showing anomalous values, among which the value of 7 ppb is the highest. The showing of anomalous values of gold is judged to have little geochemical relation to the in-situ occurrence of

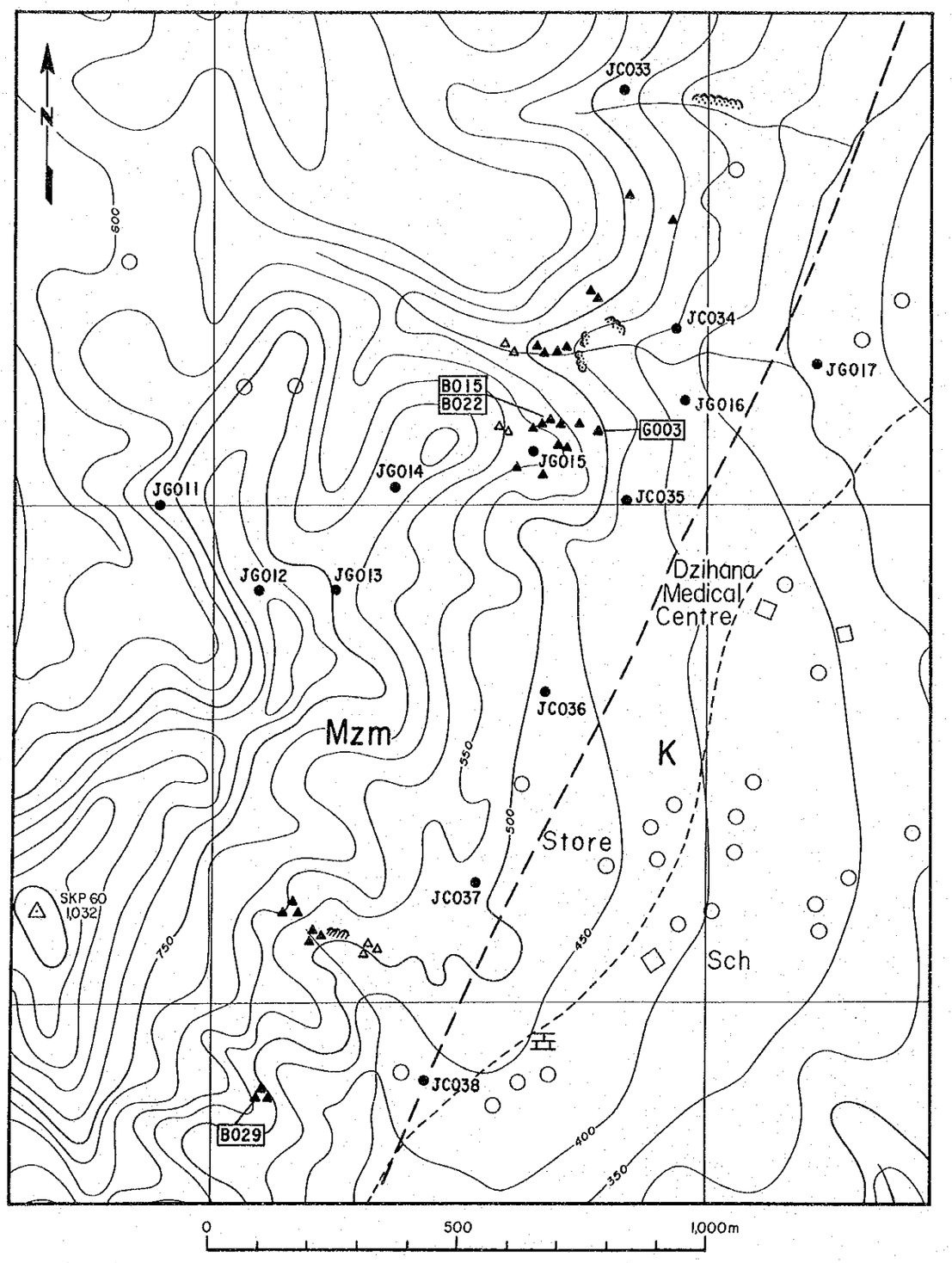


Figure II-2-3 Jibana Gossan Zone

Legend

K Kambe formation

Mzm Middle member of Mazeras formation

Fault Inferred

Outcrops

Limestone

Sandstone not altered

Sandstone altered

Floats

△ Sandstone not altered

▲ Sandstone altered (limonitized)

B015 Rock sample location

●JG012 Soil Sample location

Table II-2-1 Result of the Chemical Analysis of Gossan Samples

Sample number	Description	Au ppm	Ag ppm	Cu %	Pb %	Zn %	Fe %	Mn %
B015	limonitized sandstone	<0.07	2	0.001	0.004	0.002	2.66	0.009
B022	ditto	<0.07	<2	0.001	0.007	0.002	3.19	0.001
B029	ditto	<0.07	<2	<0.001	0.002	0.002	4.42	0.006
G003	limonite crust	<0.07	2	0.010	0.037	0.135	31.9	0.177

P52 ~ 56 欠

mineralization, since the anomalous values of gold are observed independently and scatteredly in relations to general geology and geological structure in the Area.

Silver : No anomalous values of silver are shown in the Area.

Copper : The copper-anomalous values in the Area, 88 ppm the highest, are confinedly shown in the distributing region of Mtomkuu Formation to form an anomalous zone. The anomalous zone, more than 7 km long and 0.3 to 1 km wide, is shown to be parallel to the strike extension of Mtomkuu Formation. However, the anomalous zone, which is estimated to have been formed with relatively less concentrated values of copper that might be resulted from less geochemical influence of the in-situ mineralization, is considered to be shown in relation to the influence of shale beds, which may substantially contain a high content of heavy metallic elements.

Lead : The entire anomalous values of lead in the Area are shown in the regions of Kambe Formation and Middle Member of Mazeras Formation. Sizable anomalous zones, some 2 km long and 300 to 500 metres wide in maximum, in which 2,420 ppm the highest, are observed in the region occupied by Kambe Formation. A concentration of zinc, iron and manganese in the region, in association with lead, which is estimated to have been formed in connection with the formation of ferruginous concretions in the soils of weathered limestone beds, is also remarkable. This concept should be supported by the chemical assay value of ferruginous concretion sample, numbered A005, which shows the content of lead, zinc and manganese in the range of about 0.1 to 0.9 percent, respectively. A scattered distribution of anomalous values of lead, 244 ppm the highest, is observed in the region occupied by the Middle Member of Mazeras Formation in the vicinity of Jibana Mineralized Zone and further northward. It is largely possibly estimated that the scattered distribution of lead anomalies even though may be influenced by the in-situ occurrence of lead-zinc-barite ore vein mineralization, since the anomalous showings are located close to the vicinity of faults, north-southerly, which are estimated to be closely related to the mineralization in the Area.

Zinc : Eight samples with anomalous assay values are collected from the region occupied by Kambe Formation in north-eastern end of the Area. Anomalous zones of small scale, represented by the showing of two to three anomalous values specimens, 2,110 ppm the highest, are formed. The showing of maximum value, the above, is estimated to have been formed in connection with the formation of ferruginous concretions in soils of weathered limestone beds.

Barium : The barium-anomalous values, 2,890 ppm the highest in the Area, are mostly

observed in the region occupied by the Middle Member of Mazeras Formation and are extended north-southerly with a discontinuous arrangement of anomalous separated zones, more than 2.5 km long and some 300 metres wide in maximum.

Manganese : Two specimens in the Area, with the content of more than 10,000 ppm of manganese respectively, are observed in the region occupied by Kambe Formation in north-eastern end of the Area. The concentration of manganese is considered to be formed in soils of weathered limestone beds in association with other heavy metallic elements.

Iron : The anomalous values of iron in the Area are entirely observed by the collected specimens from the region occupied by Kambe Formation, while, the anomalous zones, more than 1.5 km long and more than 300 metres wide, are concentrated in north-eastern end of the Area. The highest value of iron content reaches to be of 14.45 percent. Iron concentration in soils is estimated to be caused by the weathering of limestone beds.

Arsenic : Two specimens in the Area, with the content of 200 ppm of arsenic of the highest, are collectedly observed in the region occupied by Kambe Formation in north-eastern end of the Area. The arsenic-anomalous zones, which are estimated to be one of the concentration of elements, formed in weathered soils of limestone beds, are observed overlappedly with those of lead, zinc and iron in the region, occupied by Kambe Formation, in north-eastern end of the Area.

Mercury : The mercury-anomalous values, shown by seven specimens in the Area and to be of 2 ppm the highest, are scatteredly observed with irrelative showing to the general geological arrangements.

Sulphur : Six samples of sulphur-anomalous values were collected from the region, occupied by the Middle Member of Mazeras Formation, to form the anomalous zone, extended more than 3 km long north-southerly, about 300 metres wide, with the highest value of sulphur of 0.062 percent. An overlapping mode of appearance of the sulphur-anomalous zone with that of barium may possibly suggest the genetic relation of those to barite vein mineralization.

2-4 Interpretation

2-4-1 Mineral potential

The Jibana Area, which is directly located northward from the Kinangoni mine, where lead ore bodies are currently in mining operations, is presumed to be expectedly potential concerning to the lead-zinc-barite vein ore body, similar to that in the Kinangoni mine, because being that the geological structures, that genetically control the occurrence of the ore bodies of the above type, continuously extend into the Jibana Area.

During the course of the current geological reconnaissance works in the Area, the occurrence

of Jibana Mineralized Zone, extended some 2 km long and about 100 metres wide in NNE-SSW direction, has been estimated in the location, westward from Jibana Village, where several occurrences of gossanous materials were pointed out. The chemical assay values of the specimens from the above Zone currently show a less concentration of economic minerals, however, an interest in mineralization in deeper and/or fresh parts of the Zone should be still acted because the Zone occurrs near the mineralization-relating faults of NE-SW direction.

2-4-2 Results of geochemical research works and mineralized zone

Six elements, such as copper, lead, zinc, iron, barium and sulphur, were used for the representations of geochemical anomalous zones in the Area.

Copper is estimated to be represented by an influence of the in-situ occurrence of shale beds of Mtomkuu Formation, meanwhile, lead, zinc and iron are by that of the concentration of metallic elements in weathered soils of limestone beds of Kambe Formation, however, the respective elements the above, are estimated unlikely represented by an influence of the in-situ occurrence of lead-zinc-barite vein ore mineralization.

Anomalous zones of barium and sulphure, overlappedly observed in the Area, are inferred to be possibly represented by an influence of the in-situ occurrence of lead-zinc-barite vein ore mineralization, however, are unlikely considered to have a behaviour to show a coincident mode of appearance to that of economically significant minerals. Furthermore, a significant geological surface showing, in possible connection with barium-sulphure-anomalous zones, such as an occurrence of gossanous materials and wall rock alteration by possible mineralization, which may lead to a positive conduct of future exploration programmes, has not yet been specified in the zones.

Anomalous zones of lead show a scattered mode of showing, however, are inferred to provide geological implications of mineral possibility, such as an influence of in-situ occurrence of Jibana Mineralized Zone, a close locational relation of the showing to the structural control-fault of regional mineralization, a potential influence by an in-situ occurrence of lead-zinc-barite vein ore mineralization and etc..

2-4-3 Future work programme

The zone, which extends from Jibana mineralized Zone, through the Kinagoni mine, toward Changombe Mineral Showings in Ribe Area is evaluated to be most-highly mineral-potential. The future work programme will be discussed in the following section of Ribe Area, because the zone mentioned above is considered to be treated as an area for future exploration work.

CHAPTER 3 RIBE AREA

3-1 Measures of Survey Works

Geological mapping and geochemical exploration works, covering an area of 32 sq. km, route-mapping of a 29.6 km extension in total and collecting 82 soil samples in total, were carried out in the field during the course of the current work programme. Measures of the survey works are identical with that in Ganze Area.

3-2 Results of Geological Research

3-2-1 General geology

Geological map and geological cross-sections in Ribe Area are shown in Figure II-3-1, representative geological profile is in Figure II-3-2, respectively.

General geology in Ribe Area majorly consists of the sediments of Triassic to Jurassic ages, which are stratigraphically divided into Mariakani Formation, Mazeras Formation, Kambe Formation and Mtomkuu Formation in ascending order.

The significance differences of general geology in Ribe Area from that in Ganze and Jibana Areas are pointed out as shown below:

i) The general strike of major faults and sediments beddings are turned to NE-SW directionally in Ribe Area, whereas north-southerly in Ganze and Jibana Areas in general.

ii) Developments of faults are more significant in Ribe Area than those in Ganze and Jibana Areas.

iii) The general thickness of Kambe Formation are generally attenuated and are distributed discontinuously.

(1) Mariakani Formation (Mkl, Mkm, Mku)

Mariakani Formation in the Area is divided into three Members, those are Lower, Middle and Upper.

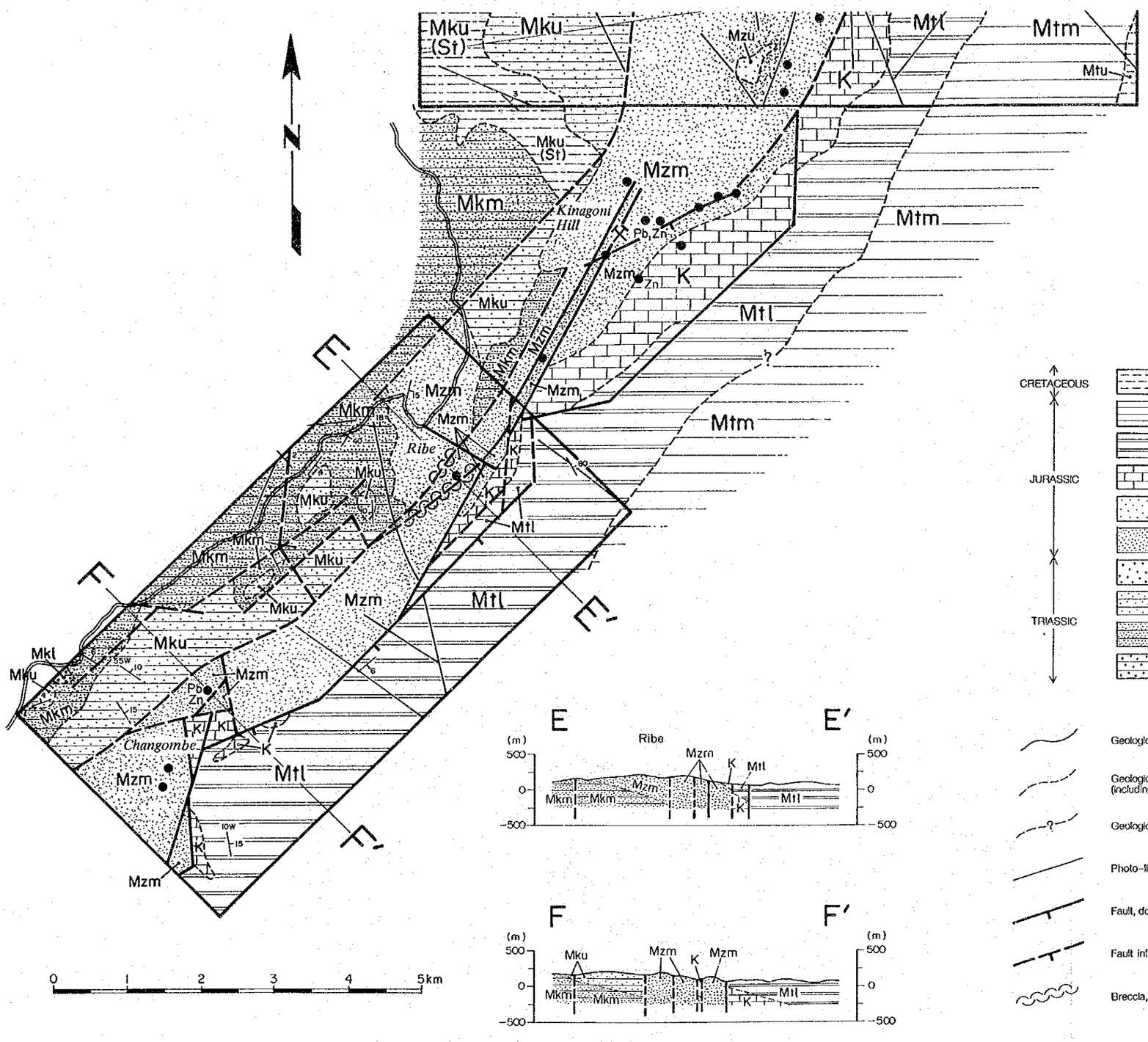
Lower Member (Mkl) of Mariakani Formation in the Area is locally distributed in western end of the Area with providing a lack of rock exposures to lead to an unsuccessful elucidation of the rock facies by the current works, while a distribution of sandstone beds is reported in existing geological informations.

Middle Member (Mkm) of Mariakani Formation in the Area is distributed in northwestern part of the Area and is mainly composed of sandstone beds, pale grey and coarse- to fine-grained. Abundant muscovite fragments are frequently observed in sandstone.

Upper Member (Mku) of Mariakani Formation in the Area is distributed in western part of the Area and is mainly composed of fine-grained sandstone beds. Lamina texture is well-developed in sandstone and is white-micaceous.

(2) Mazeras Formation (Mzm)

The Middle Member of Mazeras Formation is observed in central part of the Area, extending NE-SW directionally and having a width of 1 to 2 km. The Member is composed solely of sandstone beds and has a lack of shale beds. Granularity of the sandstone beds varies fine to



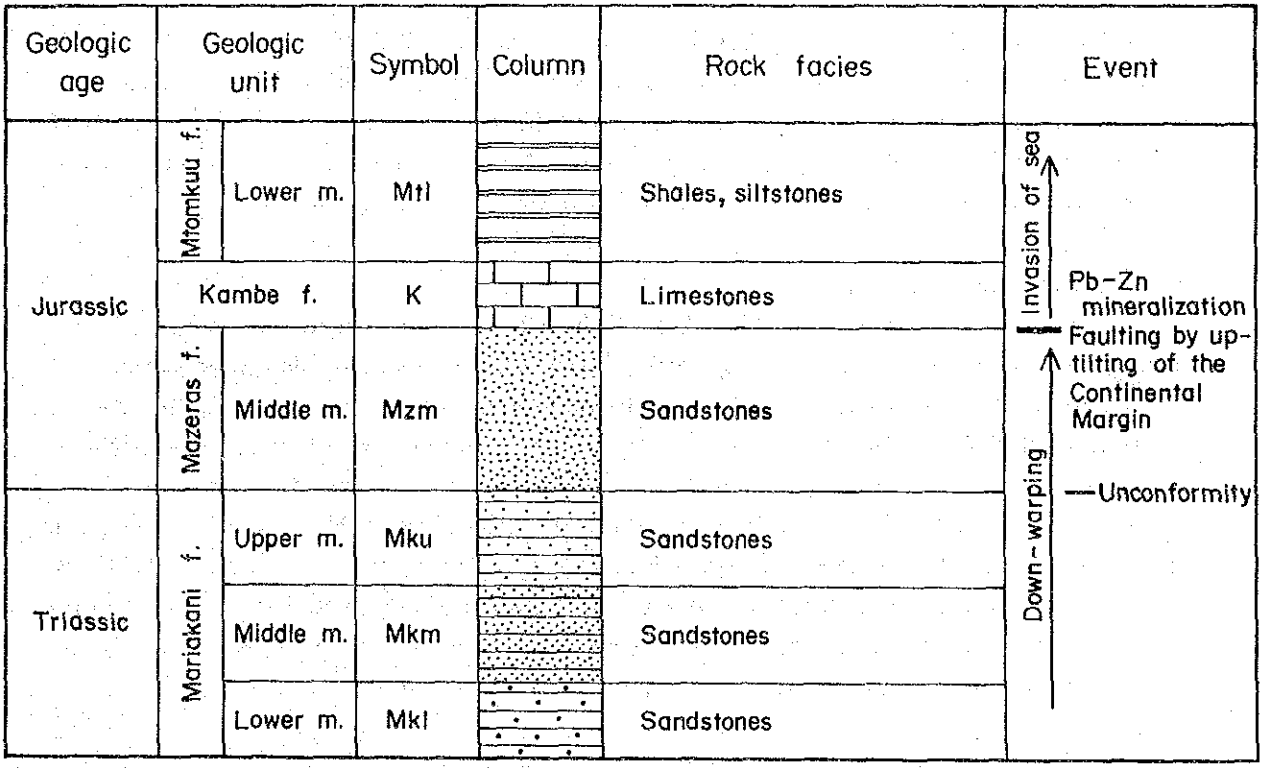
LEGEND

CRETACEOUS	Mtu	Upper Member	MTOMKUU FORMATION (Mt)	Shales, subordinate limestones, l
	Mtm	Middle Member		Shales, subordinate limestones, l
	Mtl	Lower Member		Shales/siltstones/sandstones/limestones Sandstone, s; limestones, l
JURASSIC	K		KAMBE FORMATION	Limestones, (coral-rich, c; oolitic/pisolitic, o) subordinate shales/siltstones/sandstones
	Mzu	Upper Member	MAZERAS FORMATION (Mz)	Sandstones/arkoses
	Mzm	Middle Member		Sandstones/arkoses (Slates/siltstones/sandstones, St)
	Mzl	Lower Member		Sandstones/arkoses
TRIASSIC	Mku	Upper Member	MARIAKANI FORMATION (Mk)	Sandstones (Shales/siltstones/sandstones, St)
	Mkm	Middle Member		Sandstones
	Mkl	Lower Member		Sandstones

DURUMA GROUP

- Geological boundary, known
- Geological boundary, approximate (including photo-interpretation)
- Geological boundary, inferred
- Photo-lineament
- Fault, downthrow indicated
- Fault inferred, downthrow indicated
- Breccia, shear zone
- Bedding, dip indicated
- Bedding, dip (<15°) indicated (air-photo interpretation)
- Bedding, flat-lying
- Fe — Mineral occurrence
- Mine, working
- A——A' — Line of section

Figure II–3–1 Geological Map of the Ribe Area



f. : formation m. : member

Figure II-3-2 Generalized Geological Columnar Section of the Ribe Area

coarse with a local development of lamina textures. Sandstone beds are subjected to intense hydrothermal alterations, such as limonitization, silicification and argillization. The Member is underlain by Mariakani Formation in forms of faulting and unconformity.

(3) Kambe Formation (K)

Kambe Formation in Ribe Area is composed of marine limestone beds and is locally distributed discontinuously by fault-caused dislocations. Limestone shows grey to dark grey, massive and compact and locally carries oolitic textures in fine-grained portions.

(4) Mtomkuu Formation (Mtl)

The Lower Member of Mtomkuu Formation is distributed in Ribe Area. The Member is mainly composed of shale beds, yellowish grey by a widespread weathering, with a distinguished development of lamina textures to provide a distinct fissility. Ammonite fossils were discovered by the current field works along the bank of Tsalu River, some 1 km westward from Ganzoni Village, to lead the geological correlation of the Member to being of Jurassic age.

3-2-2 Geological structure

It is to be noticeable that the sediments in Ribe Area are remarkably dislocated by a development of fault activities of large scale, which causes a considerable diversification and a disturbance of bedding structure of sediments on ground surface from the normal behaviours of striking NE-SW directional and dipping toward SE. Faults of NE-SW direction are widely developed in Ribe Area to provide a geological structural control against the sediments to turn the sediments structures to be subject to the fault behaviours. A block of sandstone beds of the Middle Member of Mazeras Formation, which is placed between two faults of NE-SW direction, is subjected to mineralized alterations in two locations to lead to a consideration that the development of faulting, particularly with NE-SW direction, might provide a possible prerequisite geological condition to form a significant mineralization in the area.

3-2-3 Ore showing and mineralized zone

The localities of mineral occurrences in the Area are shown in PL.5 and Figure II-3-3.

The occurrence of Changombe Ore Showing has been reported in existing informations and Ribe Mineralized Zone was newly discovered by the current field work. An additional new discovery(s) of encouraging mineralized zone(s) is potentially expected during any course of further exploration programme in Ribe Area, which is deserved to be evaluated so far as being one of the most promissing targets concerning to potentials of new discovery of ore body among the entire Areas of the current research programme, 1991 (Refer to Figure II-3-3).

(1) Changombe Ore Showing

Changombe Ore Showing is located in south-western part of the Area, while, Changombe North and Changombe South are ever known. Exploration works of varied type, i.e., geochemical exploration works (in 1967 and 1977-1980), diamond drill works (in 1968-1970) and geoscientific documentations on geology and ore mineralization (in 1969-1970) were ever implemented for the above ore showing. The results of those works are referred to the Report

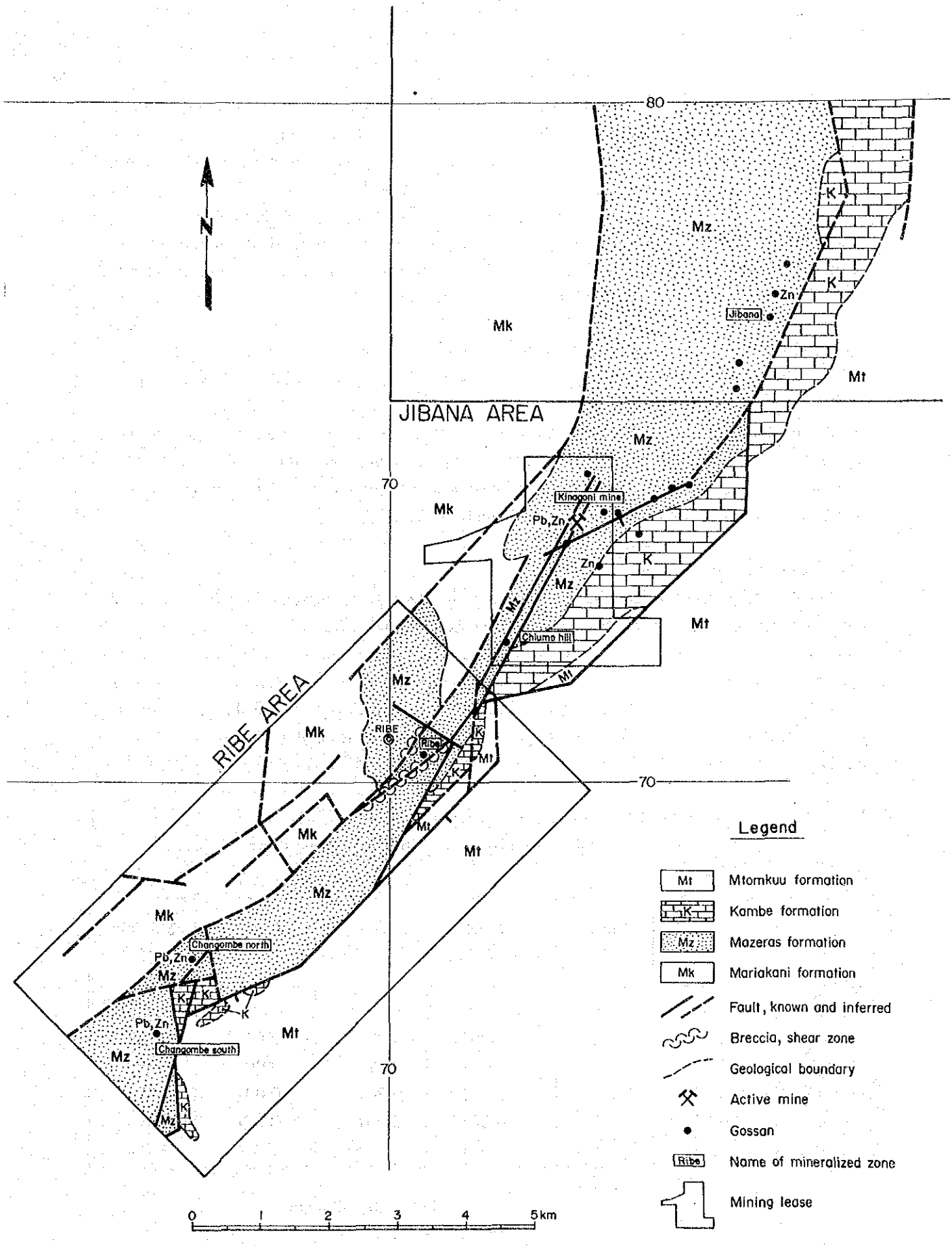


Figure II-3-3 Mineralized Zones in the Ribe-Jibana Area

on the first-year works 1990 of the current programme, Mombasa Area, Cooperative Mineral Exploration Project, Kenya-Japan. Based on the results by the above and the current works, the type of mineralization of Changombe Ore showing is considered to be of vein ore mineralization of quartz veins and networks, associated with galena and sphalerite majorly and a small quantity of pyrite and sparse chalcopyrite, and with calcite and barite as gangue minerals. Wall rock of the mineralization is of coarse-grained sandstone beds of Mazeras Formation, partly intensely brecciated and altered by silicification and argillization. Inferred ore reserves of 430,000 long tons with grades of 3.1 percent of zinc and 0.84 percent of lead, were estimated by the previous diamond drill operations, the above, by 20 holes totalling 2,235 metres (Rainey, T.P., 1971). However, the geographical locations of the above drill sites are currently out of details. Modes of occurrence of the above ore showing were investigated again by the current works. Three samples of silicified, limonite-stained sandstone, associated with quartz fine veins from the Changombe North chemically show that less than 0.07 gramme of gold per ton, 2 to 80 grammes of silver per ton, 0.08 percent copper in maximum, 0.01 to 0.05 percent lead and 0.02 to 0.07 percent zinc. Sericite/montmorillonite mixed layer clay mineral has been identified in argillized sandstone by X-ray diffraction examination.

(2) Ribe Mineralized Zone

Ribe Mineralized Zone, newly discovered by the current works, is situated on the hill crest, 0.5 km eastward from Ribe Village. The Zone shows an extension of more than 300 metre by 100 metres. Figure II-3-3 shows the location of the Zone in relation with other mineralized zones and in connection with general geological situations in the Area. Wall rock of the Zone is of sandstone beds of the Middle Member of Mazeras Formation. Wall rock is subjected to silicification and argillization to show a white appearance and is limonite-stained. It is also partly brecciated intensely. General facies appearance of the Zone is noticeably similar to that

Table II-3-1 Results of Chemical Analysis of Altered Rocks in Ribe Mineralized Zone

	Gold g/T	Silver g/T	Copper %	Lead %	Zinc %	Sulphur %
B043	< 0.07	< 2	0.002	0.006	0.004	0.229
B046	< 0.07	< 2	< 0.001	0.002	0.001	0.050
B048	< 0.07	2	< 0.001	0.002	< 0.001	0.028
B049	< 0.07	< 2	< 0.001	0.002	< 0.001	0.030
B050	< 0.07	< 2	< 0.001	0.001	< 0.001	0.038
G006	< 0.07	10	< 0.001	0.001	0.003	0.033

g/T : gramme per ton
% : percent

of the Changombe North. X-ray diffraction data has identified clay minerals in altered sandstone as sericite and kaolinite. General occurrence of ore minerals in the Zone on ground surface is invisible by unaided eye after most-possible leaching by weathering. Chemical assay values of altered rock specimens of Ribe Mineralized Zone are shown in Table II-3-1. A small amount of plumbogummite, a secondary mineral occurring in lead deposits, has been identified in gossanous sandstone by X-ray diffraction examination.

3-3 Results of Geochemical Exploration Research

3-3-1 Chemical analysis and interpretation

Chemical analysis and interpretation in the Area were implemented in accordance with the same measures to those in Ganze Area.

3-3-2 Interpretations of geochemical anomalies

The localities of geochemical anomalies in the Area are shown in PL.7, PL.8 and PL.13.

The geochemical general characteristics of respective pathfinders examined by the current works are stated below:

Gold : Anomalous value of gold is not observed in the Area.

Silver : Anomalous values of silver in six specimens, 3.4 ppm the highest, are totally observed in Ribe Area among three northern Areas, Ganze, Jibana and Ribe. Silver-anomalous zones of relatively small scale in two locations, formed by each group with three anomalous values respectively, are represented to be affectedly overlapped with the locations of occurrence of Changombe North and Changombe South Mineral Showings.

Copper : Anomalous values of copper in seven specimens, 78 ppm the highest, are collectedly observed in accordance with the occurrence of Mtomkuu Formation in the Area to form the geochemical anomalous zones. The zones, more than 2.2 km long and about 300 metres wide, extend along with the strike direction of Mtomkuu Formation. The copper-anomalous zones in the Area, which are considered to be affected by the chemical feature of the shale beds of Mtomkuu Formation, that is characterized by carrying a dominant quantity of heavy metallic elements, are estimated to have the substantially identical feature to that in Jibana Area.

Lead : Anomalous values of lead in five specimens, 718 ppm the highest, are collectedly observed in accordance with the occurrence of Mazeras Formation in the Area to form the geochemical anomalous zones of small scale. The zones are represented in accordance with the locations of occurrence of Changombe North and Changombe South Mineral Showings. The four lead-anomalous values among five show an overlap of showing with those of silver. This may provide a significant concept that lead and silver play a significant role of pathfinders in connection

with the occurrence of the lead-zinc-barite vein ore bodies of Kinangoni type.

Zinc : Anomalous value of zinc, 766 ppm, is observed in one location in the Area in the vicinity of Changombe North Mineral Showing. The zinc-anomaly, overlapped with that of silver and lead in the Area, is considered to be affectedly shown by the mineralization, however, the effectiveness of zinc from the standpoint geochemistry in the Area is evaluated to be less than that of silver and lead due to being with a less frequency of appearance.

Barium : Anomalous value of barium, 4,200 ppm, is observed in one location in the Area in south-west of Changombe North Mineral Shwoing. The barium-anomaly in the Area, where barite vein ore floats are observed, is estimated to be affectedly shown by the mineralization, however, is evaluated to be less effective geochemically in the Area by the identical reason concerning to the occasion of zinc.

Manganese : Anomalous value of manganese, more than 10,000 ppm, is observed in one location in the Area in south-west of Changombe North Mineral Showing. The manganese-anomaly in the Area appeares overlappedly with the barium-anomaly, however, the genetic relation to mineralization is still obscure.

Iron : Anomalous value of iron in the Area is not observed by the current works.

Arsenic : Anomalous values of arsenic in three specimens in the Area, 90 ppm the highest, are observed likely independently to lead to an obscurity of relation to the geology in the Area.

Mercury : Anomalous values of mercury in abundant number of specimens, 5 ppm the highest, are wide-spreadly observed in the Area. The mercury-anomaly is not observed in the Changombe Mineral Showing environs.

Sulphur : Anomalous value of sulphur, 0.025 percent, is observed in one location in the Area to be overlapped by silver- and lead-anomalies. The sulphur-anomaly in the Area is possibly estimated to be affected by the mineralization, however, less effective geochemically due to an extremely limited appearance in the Area.

3-4 Interpretation

3-4-1 Mineral potential

Ribe Area is closely situated south-westward to the Kinagoni lead ore bodies in mining operations currently and includes Changombe Ore Showing ever known and Ribe Mineralized Zone newly discovered by the current works and is considered to be highly potential for an additional new discovery(s) of ore showing(s) or mineral ore body(s). The general features of geological structures in Ribe Area, in regards to the potential(s) of vein-type ore mineraliza-

tion, are stated below:

i) Faults, NE-SW directional, which are estimated to be closely related to the forming of lead-zinc vein ore body, are well-developed in the Area.

ii) Faults, NW-SE directional, which show an intersecting behaviour to those, the above, are also well-developed around the Area as shown in Figure 4. Ribe Area is situated in the location, where both of the above faults show a manner of frequent intersections to possibly provide the spaces to form passages of hydrothermal ore solution.

iii) Statistical examinations of the strike/dip values of the sediment beddings in the Area show a remarkable geological disturbance, i.e., some 64 percent of the values out of the total shows deviated from the general, which is to be striking NE-SW and gently dipping toward SE.

iv) Kinagoni mining area environs is considered to be located under an unique geological situation, where an intersection of tectonic structures of N-S and NE-SW directions is observed.

The new discovery of the Ribe Mineralized Zone during the course of the current research works by semi-regional investigation along relatively separated reconnaissance routes, may encouragingly suggest a potential possibility of another new discovery of mineralization or ore showing during a course of further works.

3-4-2 Results of geochemical research works and mineralized zone

Three elements, such as silver, copper and lead, were examined for the representations of geochemical anomalous zones in the Area. Copper is estimated to be affected by the in-situ occurrence of shale beds of Mtomkuu Formation, while, silver and lead are by the mineralization related to Changombe North and Changombe South Mineral Showings.

Geochemical features concerning to the mineral showings, ever been known in the Area, are considered to have been revealed by the current second-year programme. Meanwhile, the Ribe Mineralized Zone, for which the current geochemical works have achieved a partial work coverage in the field to obtain a limited information, has been known by the geological reconnaissance work of the current second-year programme.

Eleven elements, such as gold, silver, copper, lead, zinc, barium, manganese, iron, arsenic, mercury and sulphur, have been used as the pathfinders for the soil geochemistry of lead-zinc-barite vein ore mineralization in northern three Areas, such as Ganze, Jibana and Ribe, by the current works. Followings are the summaries on the general geochemical applicabilities of the above pathfinders in the Areas.

Gold : Considered to be lesser affected by mineralization.

Silver : Considered to be affected by mineralization. Applicability should be more reliable by an improvement of the detection limit of existing 0.2 ppm.

Copper : Considered to be lesser affected by mineralization. Affected by occurrence of shale beds of Mtomkuu Formation.

Lead : Considered to be affected by mineralization, and weathered soils of limestone beds in some occasion. Considered to be effective in the field with a lack of occurrence of limestone.

Zinc : Considered to be affected by occurrence of limestone bed in some occasion. An influence by mineralization is obscure.

Barium : Considered that an influence by mineralization is obscure.

Manganese : Considered to be lesser affected by mineralization, however, affected by occurrence of weathered soils of limestone beds in some occasion.

Iron : Considered to be lesser affected by mineralization, however, affected by occurrence of weathered soils of limestone beds in some occasion.

Arsenic : Considered to be lesser affected by mineralization.

Mercury : Considered to be lesser affected by mineralization.

Sulphur : Considered that an influence by mineralization is obscure.

It is, consequently, concluded that silver and lead are considered to be effectively applicable for the selection of geochemical pathfinders in the Areas, inversely, zinc, barium and sulphur are inactive.

3-4-3 Future work programme

The Ribe Area is evaluated to be deserved for further consecutive implementations of geoscientific research works by demarcating the areas for detailed research work, since the Area is estimated to be with a considerably high mineral potential.

The zone, extending from Jibana Mineralized Zone to Changombe Mineralized Zone, the Kinagoni mine in the middle, is considered to be deserved for the implementations of further systematized detailed exploration works, because that the general infrastructures and man-power capabilities around the Kinagoni mining area are reputed to be well-developed and well-organized, while, that an inauguration of new mine after a successful discovery of ore body(s) may lead to a significant contribution for an extension of the existing Kinagoni mine life and also for a further development of local economy.

In the zone, diamond drill operations investigating the mineralization at deeper portions are recommended in Ribe and Chiume Hill mineralized zone, where no diamond drill has been carried out by past exploration programme though significant showings of mineralization are present. Detailed geological survey works preceding the drill operations may be desired to locate the drill sites in both the mineralized zones.

Changombe North and Changombe South Mineralized Zones are considered to be reasonably excluded from the future programme area, because that a considerable quantity of

diamond drill operations, to establish final interpretations based on some resultant discouraging achievments, have already been implemented in the Zones.

CHAPTER 4 MKANGOMBE AREA

4-1 Measures of Survey Works

Geological mapping, geochemical exploration works and trench pits prospecting, covering an area of 196 sq. km, route mapping of a 147.0 km extension in total, collecting 452 soil samples in total and four trench pits prospecting were carried out in the field during the course of the current work programme. Measures of geological and gochemical works are identical with that in Ganze Area. Four trench pits digging, 1.5 metres wide and 1.5 metres deep down to bed rock surface each and 50 metres long in total was carried out in four locations in Mkangombe North Ore Showing.

4-2 Results of Geological Research

4-2-1 General geology

Geological map and geological cross-sections in Mkangombe Area are shown in Figure II-4-1, representative geological profile is in Figure II-4-2, respectively.

General geology in the Area majorly consists of the sediments of Permian to Triassic ages, which are stratigraphically divided into Maji-ya-Chumvi and Mariakani Formations in ascending order from north-west toward south-east in the Area. The sediments are generally extended mostly north-east to south-west directionally. Lamprophyre dyke is observed in one location in the Area.

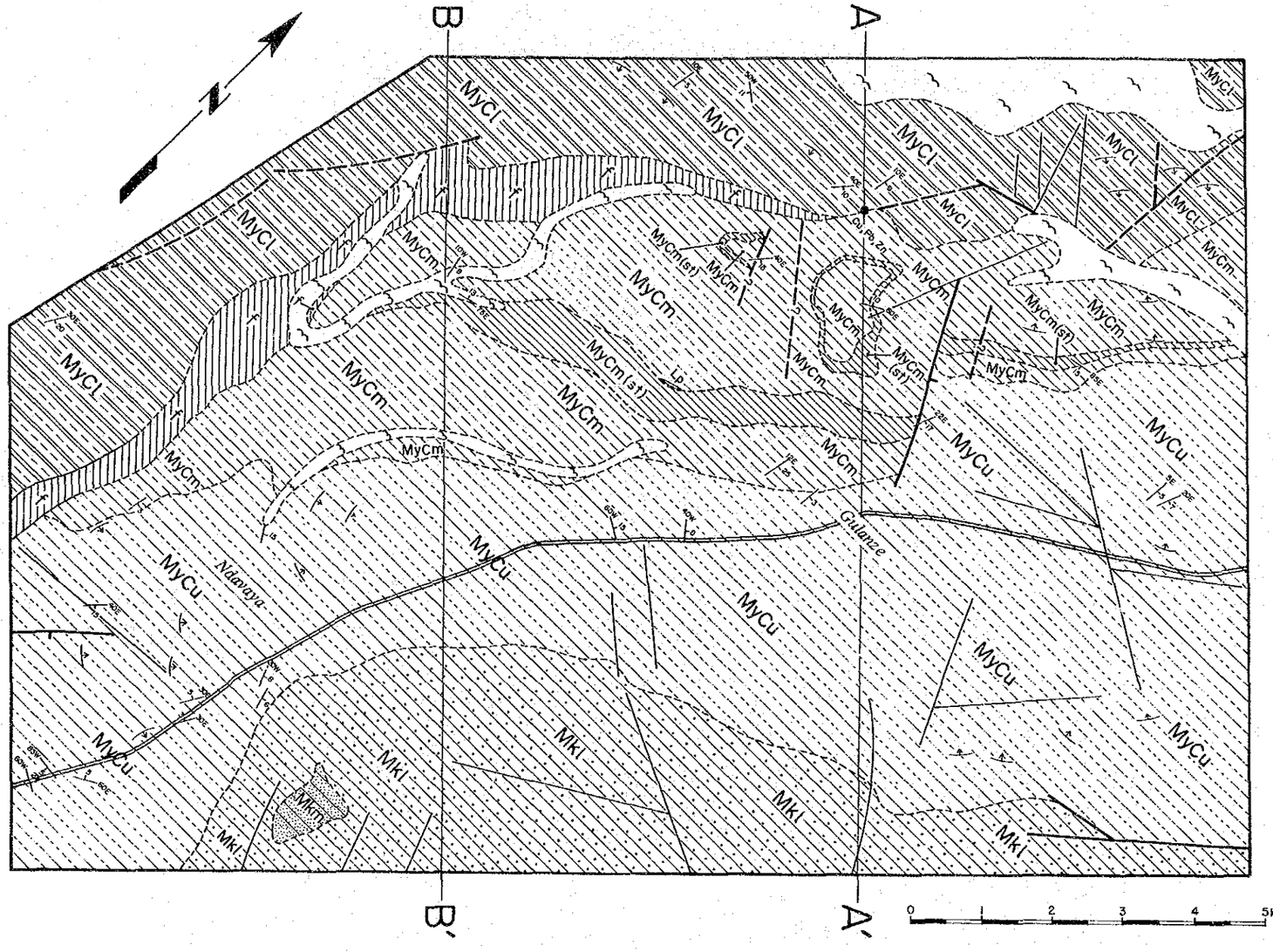
(1) Maji-ya-Chumvi Formation (MyCl, MyCm, MyCu)

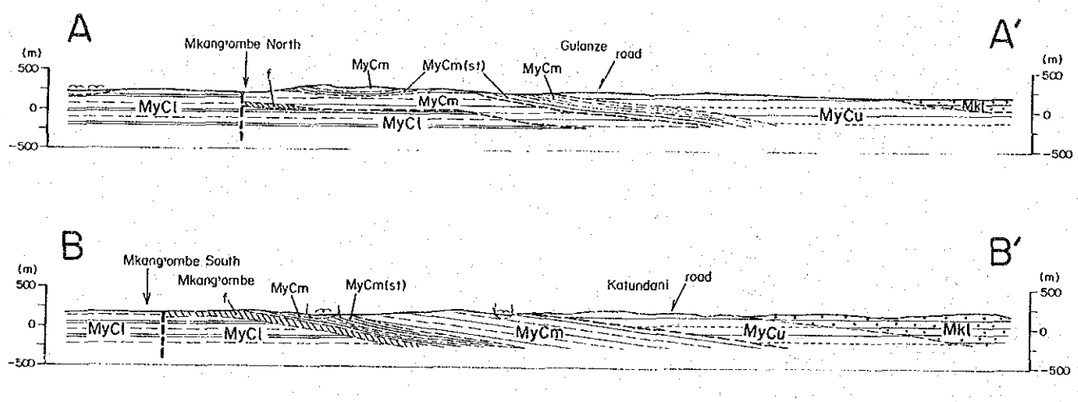
Maji-ya-Chumvi Formation is widely observed to cover the most part of the Area and is subdivided into Lower Member (MyCl), mainly composed of shale beds, Middle Member (MyCm), mainly composed of sandstone beds and Upper Member (MyCu).

Lower Member (MyCl) of Maji-ya-Chumvi Formation mainly consists of shale beds, correlated to be of Permian age and is distributed along the north-western end of the Area, showing a 1.5 to 3 km width. Shale shows pale-grey to dark grey, bluish grey or greenish grey and etc., associated with a development of flaggy texture, which causes having a thinly fissile feature along laminas. Shale beds are locally intercalated by very fine-grained sandstone beds, 5-10 cm thick, and also locally show a sandy facies.

Middle Member (MyCm) of Maji-ya-Chumvi Formation mainly consists of sandstone beds, which are frequently intercalated by shale beds (f, MyCm-St), with a width of some 1 to 4 km, and are correlated to be of Triassic age. Sandstone shows greenish-grey, mainly fine- to very-fine-grained, with a development of distinct lamina texture, particularly with flaggy fissility in micaceous portions. Massive, compact and limy fine-grained sandstone beds are also observed in several locations. Shale (f, MyCm-St) shows yellowish grey, bluish grey or greenish grey and etc., with a development of flaggy texture. Shale also shows a varied change of facies by intercalations of thin-bedded siliceous, micaceous and very-fine-grained portions.

Upper Member (MyCu) of Maji-ya-Chumvi Formation mainly consists of sandstone beds, intercalated by a small quantity of thin shale beds and is correlated to be of Triassic age. It is distributed having a width of some 3 to 7 km. Sandstone shows greenish grey in unweathered portion, fine- to very-fine-grained, micaceous with a well-development of lamina texture. Inter-





LEGEND

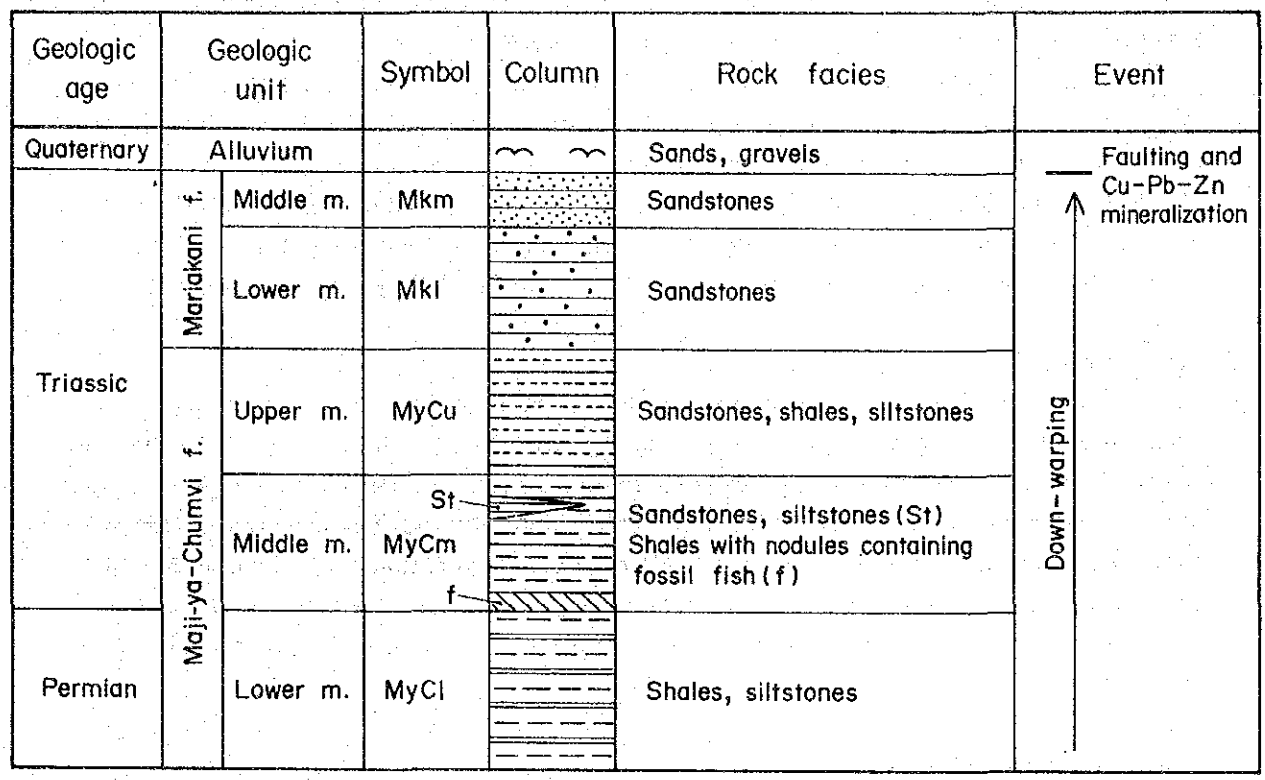
QUATERNARY	Recent				Alluvium
		Rc			Colluvium and residual soils
TERTIARY	Pliocene	Mu	Upper Member	MAGARINI FORMATION (Mj)	Sands
		Mzu	Upper Member	MAZERAS FORMATION (Mz)	Sandstones/arkoses
JURASSIC		Mzm	Middle Member		Sandstones/arkoses (Slates/siltstones/sandstones,Sl)
		Mku	Upper Member		Sandstones
		Mkm	Middle Member	MARIAKANI FORMATION (Mk)	Sandstones (Shales/siltstones/sandstones,Sl)
TRIASSIC		Mkl	Lower Member		Sandstones
		MyCu	Upper Member		Sandstones/shales/siltstones
		MyCm (f, st)	Middle Member	MAJIYA-CHUMVI FORMATION (MyC)	Shales/siltstones,sl./sandstones Shales with nodules containing fossilfish,f
PERMIAN		MyCl	Lower Member		Shales/siltstones, subordinate sandstones,s

DURUMA GROUP

Igneous Rocks

- Lp — Lamprophyric dyke
- Geological boundary, known
- Geological boundary, approximate (including photo-interpretation)
- Photo-lineament
- Fault, downthrow indicated
- Fault inferred, downthrow indicated
- 10 — Bedding, dip indicated
- Bedding, dip(< 15°) indicated (air-photo interpretation)
- Cu — Mineral occurrence
- Spring
- A — A' — Line of section

Figure II–4–1 Geological Map of the Mkangombe Area



f. : formation m. : member

Figure II-4-2 Generalized Geological Columnar Section of the Mkangombe Area

calated shale shows yellowish grey in weathered portion, some several tens centimetres to several metres thick, and carries a well-development of flaggy texture.

(2) Mariakani Formation (Mkl, Mkm)

Mariakani Formation is observed along the south-eastern end of the Area and is mainly composed of sandstone beds. The Formation is divided into Lower (Mkl) and Middle (Mkm) Members, which are respectively correlated to be of Triassic age.

Lower Member (Mkl) occupies a main part of Mariakani Formation and mainly consists of fine-grained sandstone beds, yellowish grey by weathering on ground surface, while, with a poor development of lamina and bedding textures.

Middle Member (Mkm) is limitedly distributed in the vicinity of hilly regions, about 2.5 km eastward from Ndavaya Village. The Member mainly consists of massive and fine-grained sandstone beds, yellowish. Middle Member is usually distinguished hardly from the Lower Member.

(3) Intrusive rock

Floats of lamprophyre, which are presumed to be moved very little off from its in-situ occurrence site, are observed in one location in the Area. Lamprophyric intrusion in the Area is considered to be simultaneously activated to that observed in Mrima-Jombo Area and/or Mukundi environs, where its activities have been widely erupted. Lamprophyre in the Area shows dark grey, fine-grained and compact. Microscopic examination of the Sample No. C015 shows that phenocrysts are of olivine and monoclinic pyroxene of less than 2 millimetres long and a groundmass is of monoclinic pyroxene and plagioclase, estimated to be of camptonitic composition.

4-2-2 Geological structure

General geological structure of the sediments in the Area is dominated by showing a strike of NNE-SSW to NE-SW, dipping 5 to 15 degrees toward SE. Faults in the Area are represented by showing NNE-SSW and NW-SE directional, however, are limitedly developed to be less than 3 km long. It has been elucidated by the current work that base metals ore veins associated with quatz in Mkangombe North Ore Showing have been formed along the fault, striking N25° to 30°E and dipping 55° to 70° toward SE.

4-2-3 Ore showing and mineralized zone

The localities of mineral occurrences in the Area are shown in PL.6 and Figure II-4-3.

Mkangombe North and Mkangombe South ore showings have ever been known in the Area. It has been shown that Mkangombe North Ore Showing is composed of base metals ore veins associated with quartz, to have been formed under structural controls by faulting, meanwhile, two ore showings, Mkangombe North and Mkangombe South, are estimated to connectedly form an overall mineralized zone of N45°E direction, associated with quartz, having abundant outcrops and floats of vein quartz with randomly intermittent intervals.

(1) Mkangombe North Ore Showing

Mkangombe North Ore Showing has attracted an attention by showing a remarkable geo-

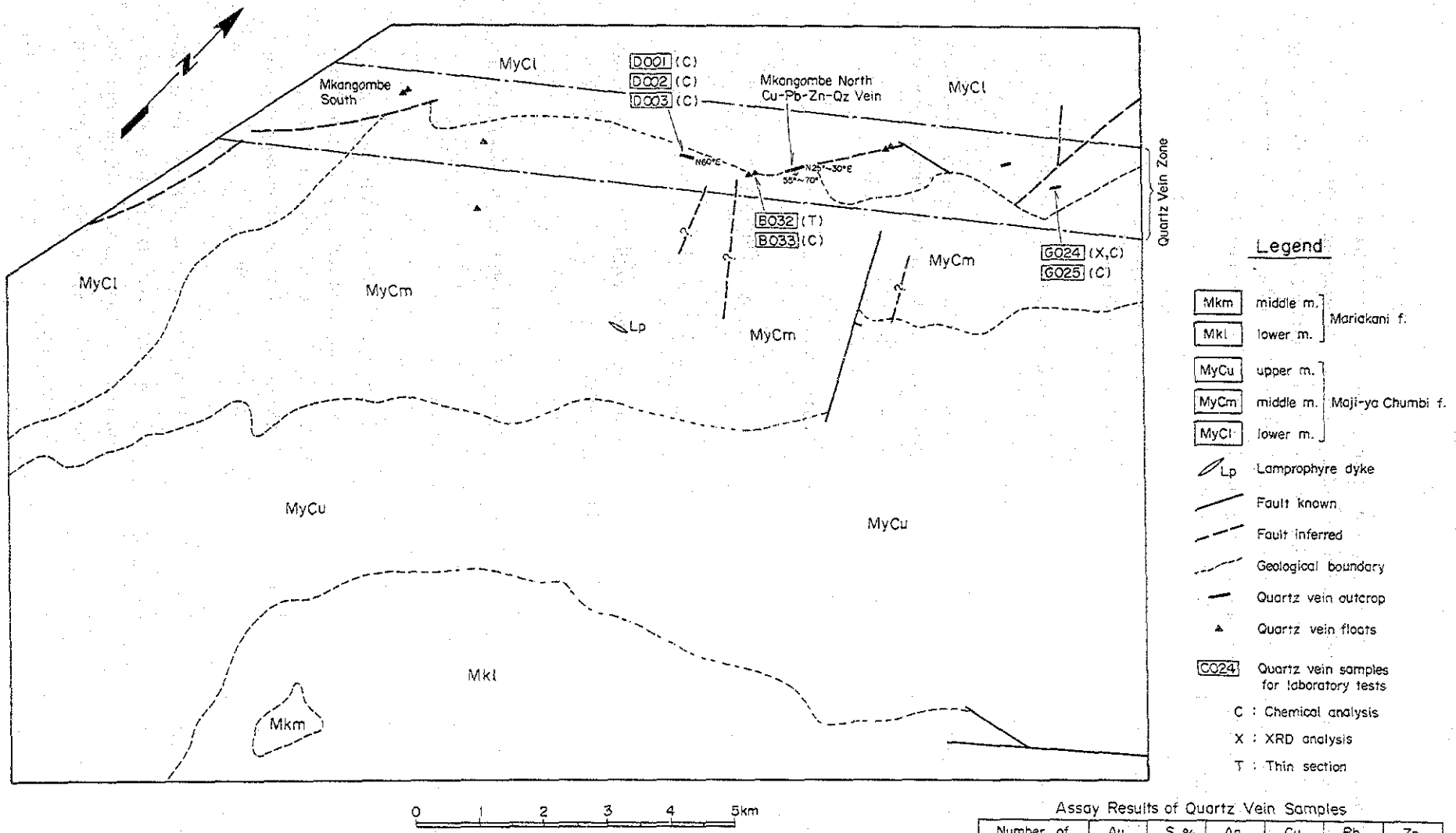


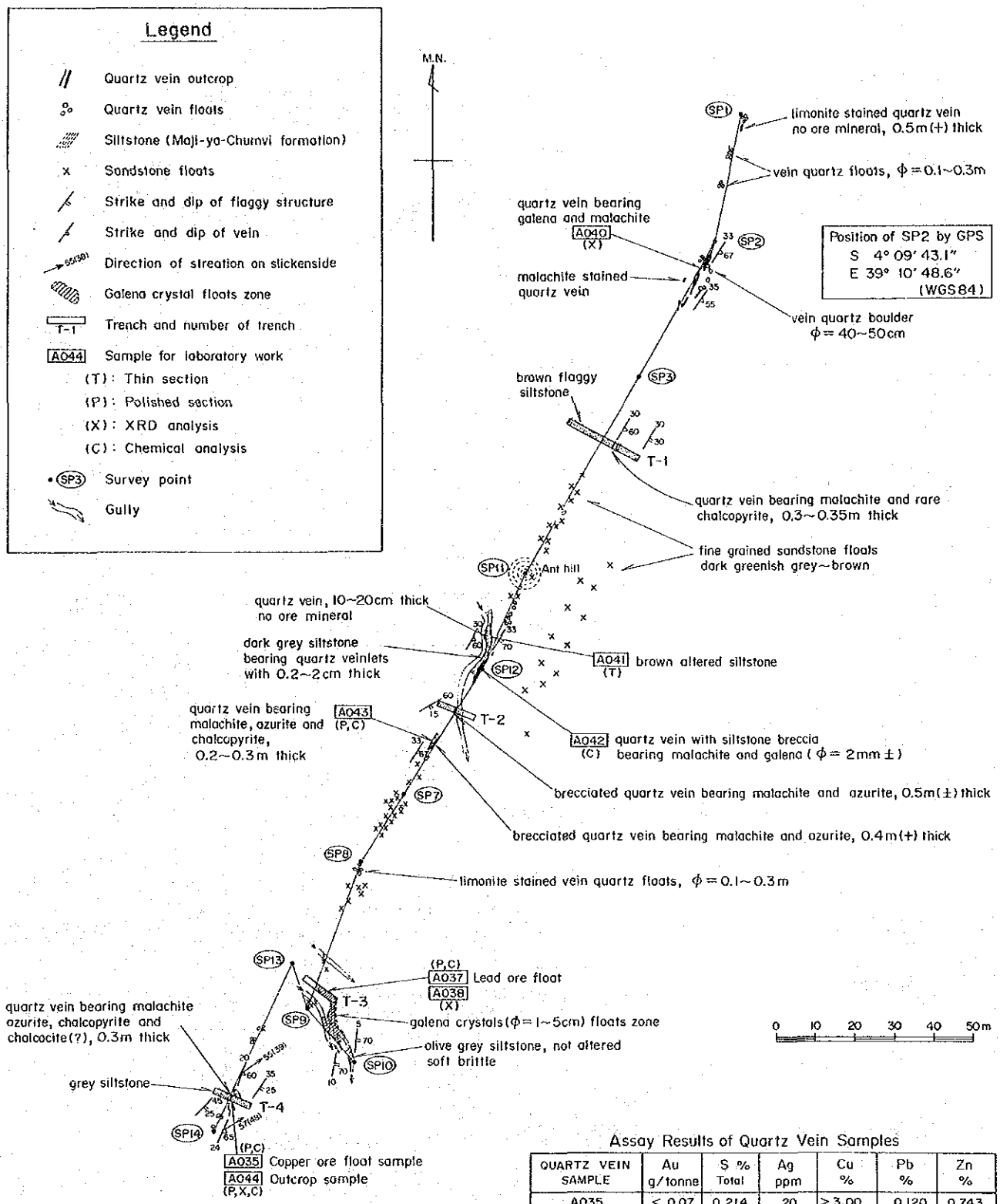
Figure II-4-3 Quartz Vein Zone in the Mkangombe Area

Assay Results of Quartz Vein Samples

Number of Sample	Au g/tonne	S % Total	Ag ppm	Cu %	Pb %	Zn %
B033	< 0.07	0.007	< 2	< 0.001	< 0.001	0.001
D001	< 0.07	0.007	< 2	< 0.001	0.001	0.002
D002	< 0.07	0.166	< 2	0.072	0.001	0.245
D003	< 0.07	0.009	< 2	0.004	< 0.001	0.005
G024	< 0.07	0.023	< 2	0.009	0.004	0.024
G025	< 0.07	0.013	< 2	0.001	0.002	0.004

chemical anomaly of gold of 407 parts per billion in enveloping soils by the geochemistry, which was carried out during the course of a part of the first-year programme 1990 of the current Project. Figure II-4-4 shows the general distribution of outcrops of quartz-re veins in the showing, while, Figure II-4-5 shows geological cross-sectional delineations of four pits walls, implemented in four locations in the showing area. The outlined generals of Mkangombe North Ore Showing, elucidated by the current works, are stated below:

Type of mineralization	:	Base metals ore vein associated with quartz, structurally controlled by faulting
Primary ore mineral	:	Chalcopyrite, galena, sphalerite, pyrite, magnetite
Secondary ore mineral	:	Malachite, azurite, covellite, cerussite, hemimorphite, hematite, maghemite, goethite, lepidochrosite
Gangue mineral	:	Quartz, calcite
Strike/Dip of veins	:	N25° to 30°E/55° to 70° SE
Extension of ore vein	:	More than 300 metres
Vein width	:	More than 20 centimetres to 1.5 metres, associated with quartz fine veins network, several metres wide
Wall rock	:	Siltstone (MyCl), Maji-ya-Chumvi Formation
Hydrothermal alteration	:	Obscure
Faulting	:	Wall rock is generally brecciated and argillized to form an association of distinct slickensides with ore veins. Wall rock fracture is generally more intense in hanging wall side, 0.5 to 2 metres wide.
Chemical values of ore	:	Results of chemical assay of ore are shown in Table on Figure II-4-4. Precious metals content is low, while copper-lead-zinc contents reach on the figure of percent in some specimen



Assay Results of Quartz Vein Samples

QUARTZ VEIN SAMPLE	Au g/tonne	S % Total	Ag ppm	Cu %	Pb %	Zn %
A035	< 0.07	0.214	20	> 3.00	0.120	0.743
A037	< 0.07	9.42	12	0.109	> 3.00	0.003
A042	< 0.07	0.050	4	0.491	0.095	1.980
A043	< 0.07	0.101	4	0.290	0.063	1.135
A044	< 0.07	0.147	8	2.97	0.043	0.376

Figure II-4-4 Geological Sketch of the Mkangombe North Mineral Showing

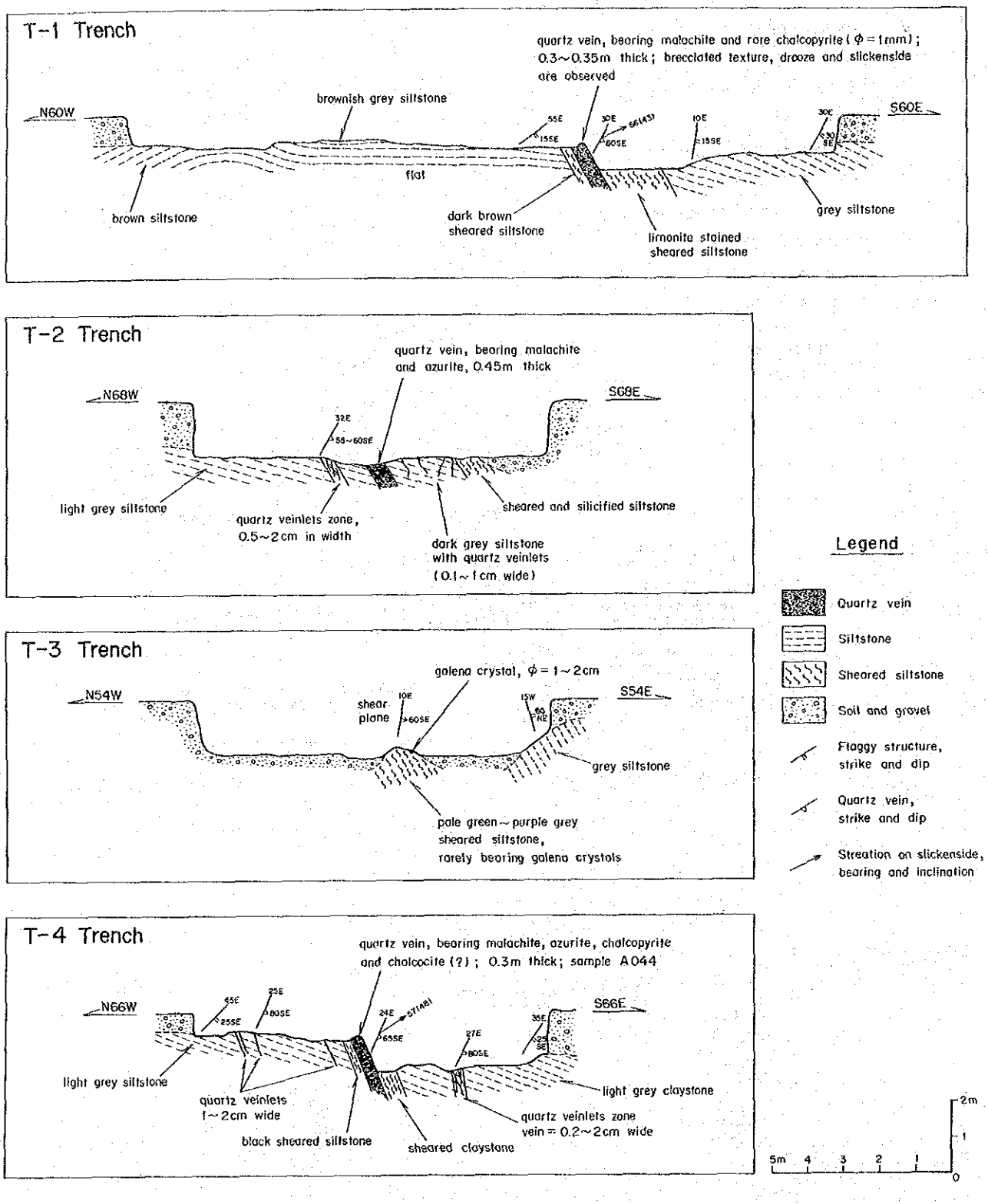


Figure II-4-5 Geological Section of Trenches in the Mkangombe North Mineral Showing

The identification of ore minerals has done through the observation of ore samples, examination of polished sections and X-ray diffractive analysis.

Galena is observed not only in quartz ore veins, but also in fractured clayey materials in a form of relatively large crystal grains, 0.5 to 5 centimetres diameter, in association with calcite on hanging wall. Such crystal grains of galena, which presumed to be accumulated by weathering apart from in-situ occurrences, are also observed in the place near to the trench pit T-3 by the current works, as shown in Figure II-4-4 and II-4-5. Primary zinc ore minerals are invisible by unaided eye in samples numbered A042 and A043, however, they show zinc content values of more than one percent, respectively. It may be suggested the above samples might carry secondary zinc ore minerals. Hemimorphite has been detected by X-ray diffraction examination of a sample A040. The mineralization of the Mkangombe North Ore Showing provides a feature of geological resemblance to that in copper-lead-quartz ore vein in Mukundi area of the first-year programme 1990, in regards to the common compositional constitutions of ore vein and to the spatial commonness, that is being includedly located in lamprophyric dyke-activated province.

(2) Other Ore Showing

Three outcrops of quartz ore veins and four floats zones of vein quartz, which are estimated to be moved very little off from their in-situ occurrences, have been found by the current works in N45°E-directional zone connecting the Mkangombe North and Mkangombe South Ore Showings, while, the latter has been investigated by the first-year works of the current Project. The zone, the above, is estimated to form an overall mineralized zone associated with quartz, as shown in Figure II-4-5. Occurrences of ore minerals by unaided eye, associated with quartz veins in the above zone, have never been reported up to date.

The chemical assay values of quartz ore veins specimens are shown in Table II-4-1.

Table II-4-1 Results of Chemical Analysis of Quartz Ore Vein

	Gold g/T	Silver g/T	Copper %	Lead %	Zinc %	Sulphur %
B033	< 0.07	< 2	< 0.001	< 0.001	0.001	0.007
D001	< 0.07	< 2	< 0.001	0.001	0.002	0.007
D002	< 0.07	< 2	0.072	0.001	0.245	0.166
D003	< 0.07	< 2	0.004	< 0.001	0.005	0.009
G024	< 0.07	< 2	0.009	0.004	0.024	0.023
G025	< 0.07	< 2	0.001	0.002	0.004	0.013

g/T : gramme per ton
% : percent

Chemical assay values of gold and silver are in the range of less than detection limit, while, those of base metals may show a response of weak mineralization. Any showing of concentration of ore minerals in the zone is unavailable in the field. However, it possibly seems that the ore minerals of the outcrops have been leached out by weathering and the ore grade has decreased.

even if any showing of concentration of ore minerals in the zone is unavailable in the field.

4-3 Results of Geochemical Exploration Research

4-3-1 Chemical analysis and interpretation

The general procedures of chemical analysis and interpretations in Mkangombe Area are identical to those in Ganze Area. Statistical analysis works were implemented on the basis of the population of geochemical specimens properly collected in the Area. Gold, silver and mercury, content values of those are chiefly shown to be under the detection limits, were excluded from the statistical analysis works by the current work in the Area.

4-3-2 Univariate analysis

(1) Standard statistic values

Standard statistic values in the Area are shown in Table II-4-2.

(2) Determination of cumulative frequency distribution and threshold values

Cumulative frequency distribution and interpretation diagram in the Area are shown in Figure II-4-6.

Threshold values of the respective elements in the Area are shown in Table II-4-3. The criteria for the determinations of threshold values in the Area are identical to those in Ganze Area.

4-3-3 Principal component analysis

(1) Correlation of pathfinders

Correlation coefficients between the respective pathfinders in the Area are summarizedly shown in Table II-4-4.

The entire correlation coefficient values are shown to be positive between the respective pathfiders in the Area. Positive correlations between copper, lead, zinc, iron, manganese and barium are shown to be reaching to considerably high coefficient values of 0.54 to 0.88. The correlations of arsenic to other elements are hardly observed, while, those of sulphur are estimated to be weak.

(2) Principal component analysis

The results of principal component analysis in the Area are shown in Table II-4-5.

Six elements, such as copper, lead, zinc, iron, manganese and barium provide high contribution ratios for the first principal component. The first principal component is generally estimated to show an overall concentration of metallic element, while, the representations of

Table II-4-2 Statistics of Geochemical Data – Mkangombe Area

Element	Unit	Number of Samples	※	Max.	Min.	Mean (m)	Standard Deviation (σ)	m + 2σ
Au	ppb	452	429	7	< 1	—	—	—
Ag	ppm	〃	452	< 0.2	< 0.2	—	—	—
Cu	〃	〃	16	73	< 1	7.5	0.449	59.4
Pb	〃	〃	7	108	< 2	10.3	0.310	42.8
Zn	〃	〃	0	464	2	17.1	0.340	81.7
Ba	〃	〃	0	900	10	170.4	0.354	869.8
Mn	〃	〃	0	4310	5	172.3	0.538	2057.0
Fe	%	〃	0	12.65	0.23	1.584	0.267	5.414
As	ppm	〃	262	30	< 5	7.2	0.205	18.5
Hg	〃	〃	409	4	< 1	—	—	—
S	%	〃	232	0.031	< 0.001	0.0060	0.340	0.0288

※ Number of Samples Under Detection Limit

Table II-4-3 Thresholds and Number of Anomalous Samples

– Mkangombe Area –

Element	Threshold	Number of Samples	Ratio %	Applied Criterion
Au	1 ppb	23	5.1	3
Ag	—	0	0	—
Cu	31 ppm	8	1.8	1
Pb	50 ppm	8	1.8	1
Zn	80 ppm	4	0.9	1
Ba	870 ppm	1	0.2	2
Mn	3100 ppm	3	0.7	1
Fe	5 %	12	2.7	1
As	185 ppm	9	2.0	2
Hg	2.6 ppm	3	0.7	2
S	0.023 %	2	0.4	1

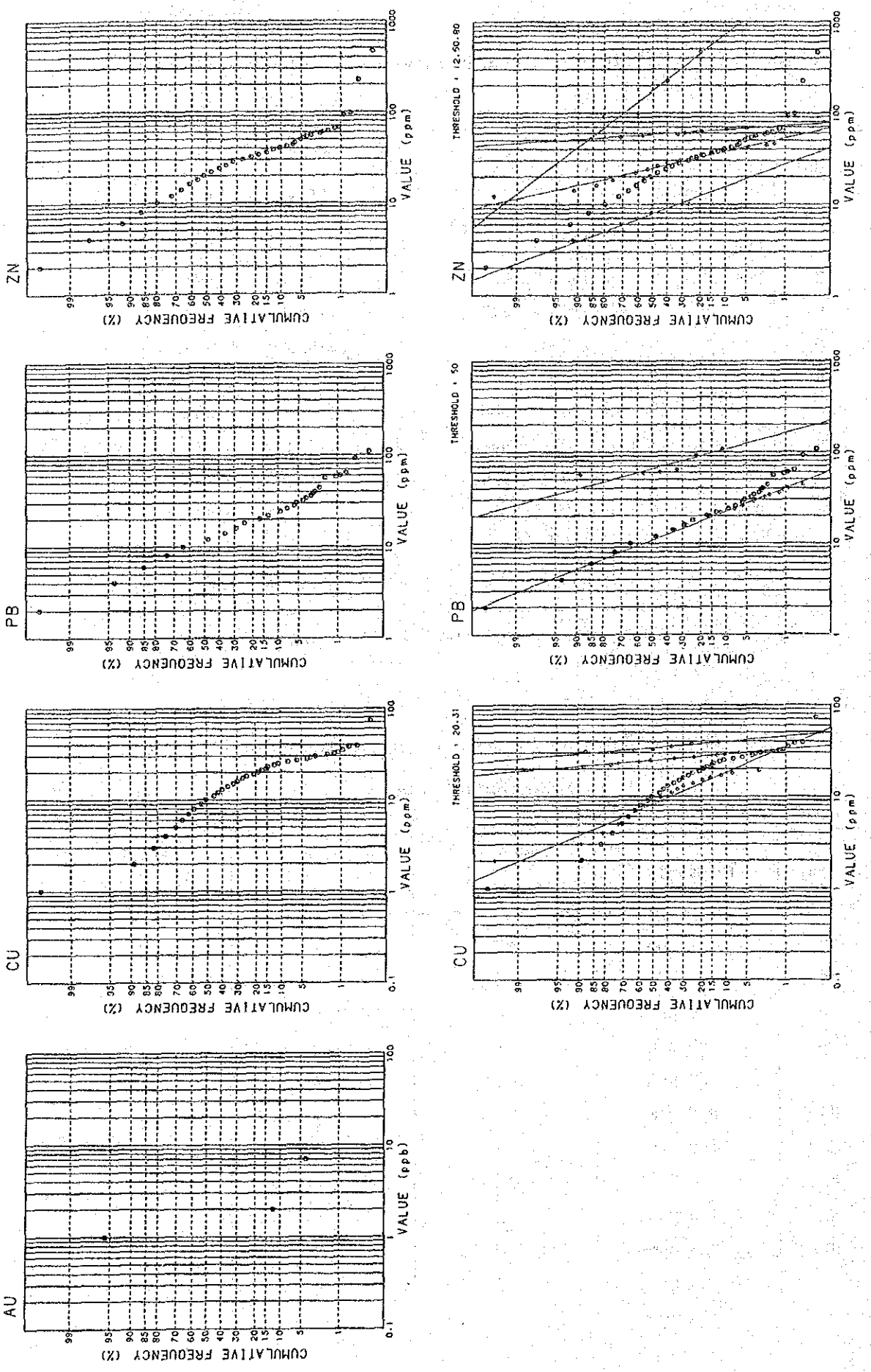


Figure II–4–6 (1) Cumulative Frequency Curves and Partition of Populations, Mkangombe Area

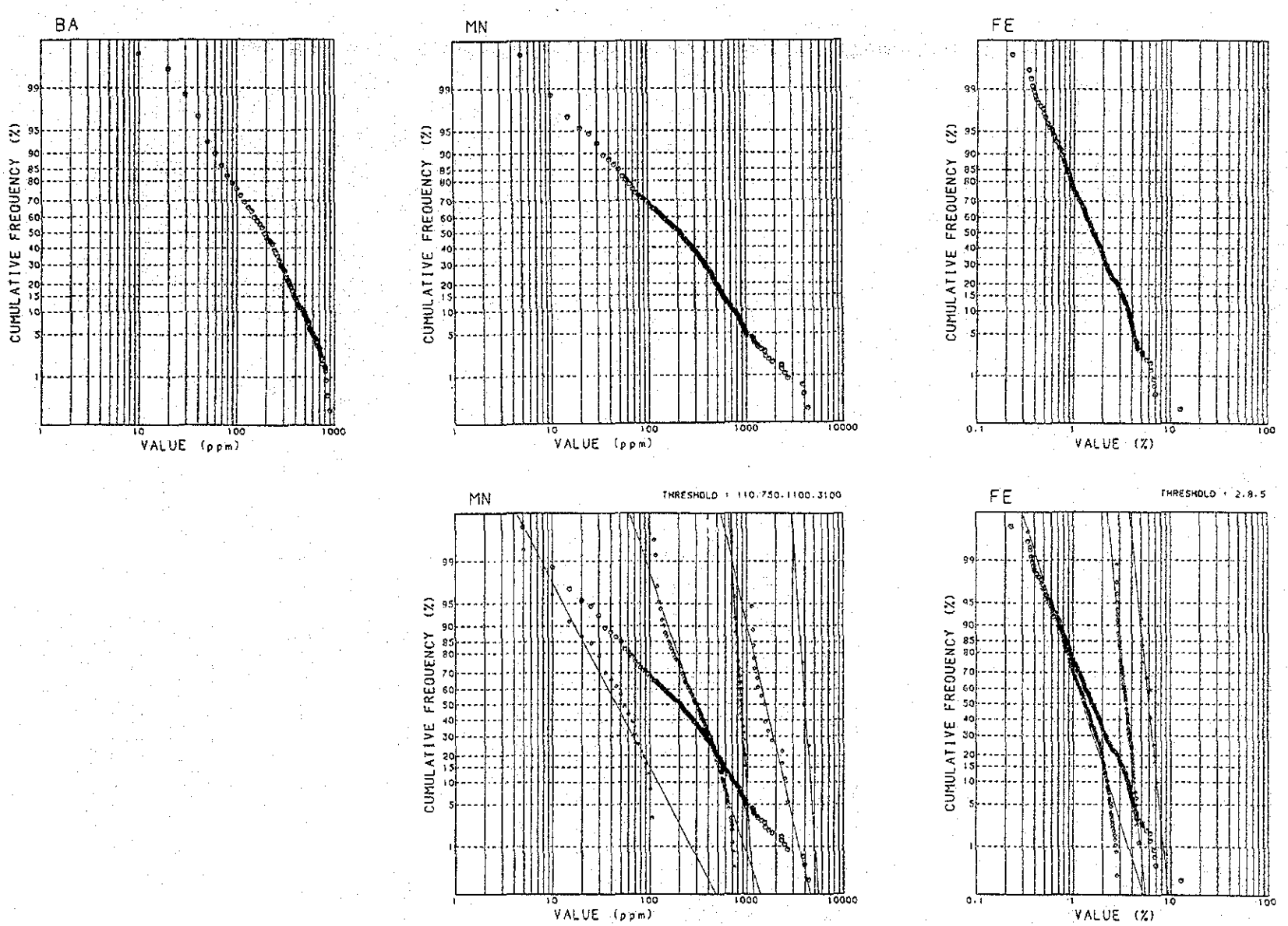


Figure II–4–6 (2) Cumulative Frequency Curves and Partition of Populations, Mkangombe Area

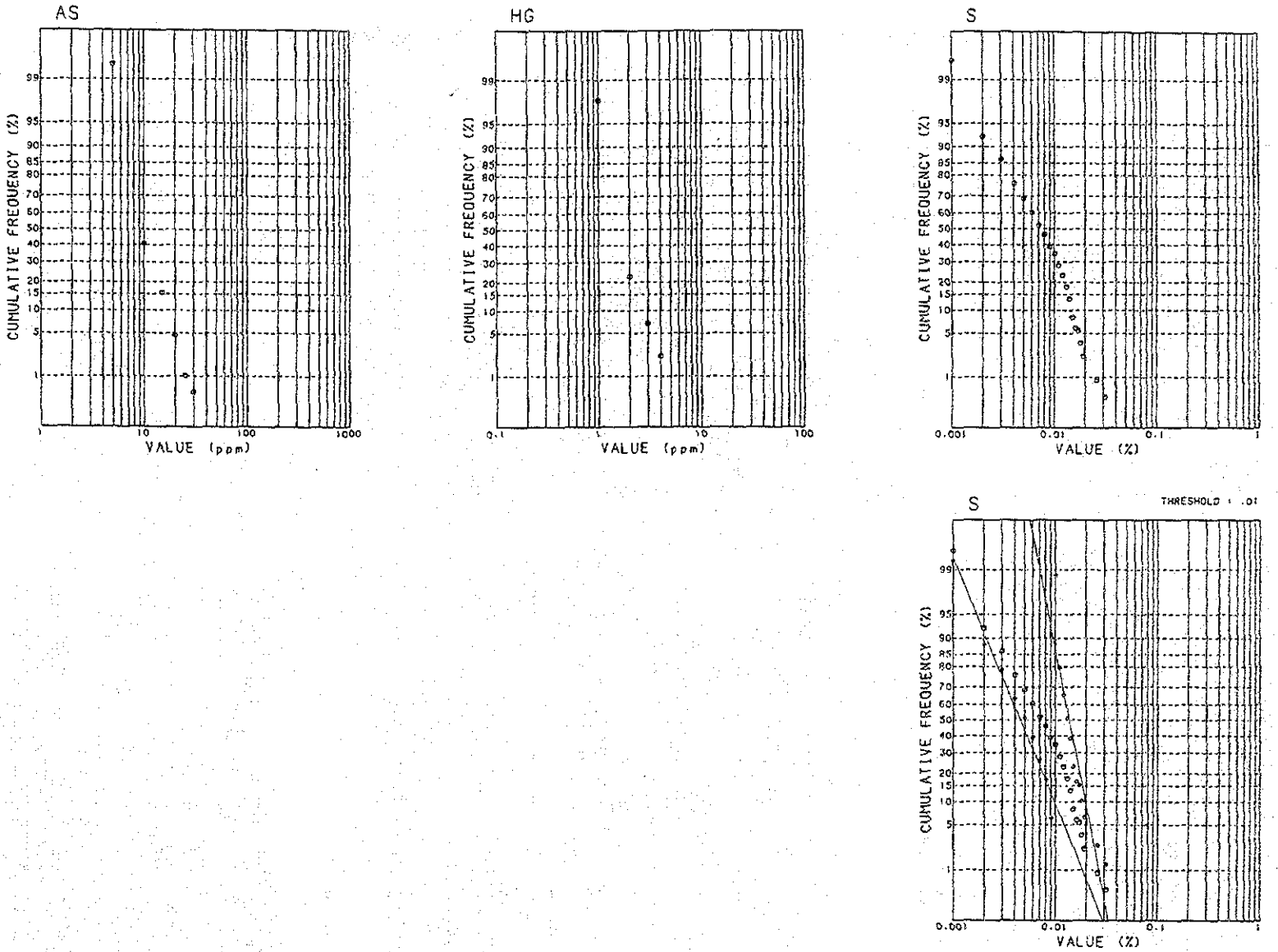


Figure II–4–6 (3) Cumulative Frequency Curves and Partition of Populations, Mkangombe Area

Table II-4-4 Correlation Coeficients-Mkangombe Area

	As	Ba	Cu	Fe	Mn	Pb	Zn	S
As	---	190	188	190	190	189	190	92
Ba	0.186	---	436	452	452	445	452	220
Cu	0.210	0.767	---	436	436	431	436	215
Fe	0.245	0.720	0.882	---	452	445	452	220
Mn	0.120	0.677	0.795	0.773	---	445	452	220
Pb	0.153	0.541	0.687	0.752	0.693	---	445	217
Zn	0.179	0.694	0.883	0.844	0.777	0.643	---	220
S	0.086	0.343	0.466	0.429	0.402	0.329	0.404	---

Right upper : Number of samples calculated
Left bottom : Correlation coeficients

Table II-4-5 Summary of Principal Component Analysis-Mkangombe Area

PRIN COMP	EIGEN VALUE	CONTRIB	CUM CONTRIB		As	Ba	Cu	Fe	Mn	Pb	Zn	S
P 1	5.017	0.627	0.627	EIGENVECTOR	.113	.365	.422	.418	.392	.356	.405	.236
				FACTOR LOADING	.253	.818	.946	.936	.879	.797	.908	.530
				CONTRIBUTION	.064	.669	.895	.876	.773	.636	.825	.280
P 2	0.961	0.120	0.747	EIGENVECTOR	.980	.006	-.020	.028	-.124	-.050	-.043	-.137
				FACTOR LOADING	.961	.005	-.020	.028	-.121	-.049	-.042	-.134
				CONTRIBUTION	.923	.000	.000	.001	.015	.002	.002	.018
P 3	0.765	0.096	0.843	EIGENVECTOR	.110	-.129	-.033	-.080	-.107	-.175	-.097	.955
				FACTOR LOADING	.096	-.113	-.029	-.070	-.094	-.153	-.084	.835
				CONTRIBUTION	.009	.013	.001	.005	.009	.023	.007	.698
P 4	0.474	0.059	0.902	EIGENVECTOR	.045	-.610	-.151	.078	.070	.755	-.143	.045
				FACTOR LOADING	.031	-.420	-.104	.054	.048	.520	-.098	.031
				CONTRIBUTION	.001	.176	.011	.003	.002	.270	.010	.001
P 5	0.310	0.039	0.941	EIGENVECTOR	-.011	.669	-.211	-.126	-.119	.415	-.547	.081
				FACTOR LOADING	-.006	.372	-.117	-.070	-.066	.231	-.304	.045
				CONTRIBUTION	.000	.139	.014	.005	.004	.053	.093	.002
P 6	0.249	0.031	0.972	EIGENVECTOR	.102	-.024	-.201	-.330	.885	-.149	-.184	.004
				FACTOR LOADING	.051	-.012	-.100	-.165	.441	-.074	-.092	.002
				CONTRIBUTION	.003	.000	.010	.027	.195	.006	.008	.000
P 7	0.127	0.016	0.988	EIGENVECTOR	-.048	-.114	.054	.748	.129	-.274	-.573	-.039
				FACTOR LOADING	-.017	-.041	.019	.267	.046	-.098	-.205	-.014
				CONTRIBUTION	.000	.002	.000	.071	.002	.010	.042	.000
P 8	0.096	0.012	1.000	EIGENVECTOR	.004	-.128	.842	-.357	-.018	.034	-.378	-.053
				FACTOR LOADING	.001	-.040	.261	-.111	-.006	.011	-.117	-.016
				CONTRIBUTION	.000	.002	.068	.012	.000	.000	.014	.000