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Co-operatives and Contract Mining in the Zimbabwe Chrome Mining Industry

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CO-OPERATIVES AND CONTRACT MINING IN THE ZIMBABWEAN CHROME MINING INDUSTRY: THE PARADOX OF INDUSTRIAL DEMOCRACY

by

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The views expressed in this monograph are those of the author and do not necessarily reflect those of ZIDS.

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PREFACE

In Zimbabwe, post-independence State policies were formulated and believed to redress past injustices and economic imbalances through a socialist model. Included in this new, apparently radical approach in the transitional period were producer cooperatives which were no longer proscribed but actively promoted under the new socialist ideology.

So far, the exact impact of these policies and the effectiveness of the cooperative strategy under the existing socio-economic structure have not been quantified and critically assessed. The purpose of this study, therefore, is to make a contribution in this direction with a view to giving some pointers for the reappraisal of State policies and priorities in economic development and socialist transformation. Although taking a sectoral approach, it is hoped the paper raises important issues not only pertaining to the chrome mining industry, but also of immediate relevance to the entire economy.

The paper is divided into two parts. The first part, which deals with problem identification and methodological issues, seeks to put chrome mining cooperatives in their proper socio-economic context and to justify the method of analysis adopted in the second part. The second part of the paper consists of the presentation and analysis of the research findings, the summary, conclusion and recommendations.

I wish to acknowledge the cooperation, support and invaluable assistance received from the Ministry of Mines, Zimbabwe Mining Development Corporation, chrome mining and smelting divisions of Anglo American Corporation and Union Carbide Corporation, Zimbabwe Insurance Brokers, the chrome mining cooperative movement, and the Zimbabwe Institute of Development Studies, in the course of preparing this research paper.

Special thanks are due to E. Kahari, D. Joniso and A. Muchenje, all of ZDMDC, for giving so freely of their time and logistical support during field work; J. Kaliyati for assistance in questionnaire designing; and P. Mashetu who gave valuable assistance in typing the manuscript. I am also indebted to my colleagues at ZIDS for valuable discussion, comments, criticisms and other assistance.

None of the above, though, bear responsibility for any errors of omission or commission contained in this paper.

H.C., Harare, original MSS March, 1989.

PART I

INTRODUCTION

In colonial Zimbabwe the issues of producer cooperatives and industrial democracy were virtually non-existent. The encouragement of cooperatives in British colonies dates back to the 1940s. Southern Rhodesia was involved as from 1944. A particular form of cooperativization limited to agriculture was developed. The official emphasis in agriculture was on marketing and input supply cooperatives.

European farmers' cooperatives were registered under the Cooperative Companies Act and generally traded in farm input items including consumer goods. There was also some involvement in the marketing of minor crops. There were no African members of these European societies.

African cooperatives were registered under the Cooperative Societies Act which was passed into law on June 1, 1956.

> The first African cooperative was formed and registered on 15/10/56. Three other societies were formed within nine months, all four being in Native Purchase Areas in Mashonaland, the relatively better agricultural area of Rhodesia. The Purchase Area farmers were at the time the only cash as opposed to subsistence producers. In June 1961 the first societies were formed in Tribal Trust Lands.[1]

These cooperatives served to reinforce the lopsided, dualistic and inequitable structure of the agricultural sector and the entire economy. During this period, producer cooperatives like the Cold Comfort Farm were harassed and eventually proscribed largely on political and ideological grounds. Producer cooperatives, therefore, are a phenomenon of the post-independence period.[2]

After its Independence in April, 1980, the new nation of Zimbabwe had high expectations for the possibility of the generation of independent industrial policies under the rubric of a socialist model. The ruling Party's official policy is to transform Zimbabwe into a socialist country along Marxist-Leninist principles.

> The August, 1984 Second National Congress of ZANU (PF) held in Harare reaffirmed this ideological position of the Party.[3]
>
> Government policy is to transform Zimbabwe into a socialist state and all our laws should be formulated in such a manner as would facilitate the restructuring of our society in order to construct a socialist state . . .

the President, Cde R.G. Mugabe, was once quoted as saying. And, on a more serious note, Cde Mugabe said:

> If we are going to be socialist, we have to be determined about it. We cannot play it the way we have been doing it.[4]

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1 The Whitsun Foundation: *African Cooperative Societies in Rhodesia:* A Survey of African Cooperatives in Rhodesia Undertaken from January to April, 1976, September 1977, p.7.
2 C. Mumbengegwi: *Some Aspects of Zimbabwe's Post-Independence Agricultural Producer Cooperatives:* A Profile and Preliminary Assessment, June 1984, p.2.
3 N. C. G. Mathema: *Cooperatives and Government Policy in Zimbabwe,* p.2.
4 *The Herald,* September 26, 1986, p.1; February 2, 1989, p.1.

Much has been said and done about the formation and role of cooperatives after Independence.[5] The cooperatives are believed to play a role different from that of pre-Independence societies because, after Independence, they have been organized along socialist lines.

The Zimbabwe Government policy on cooperatives says under "Broad Objectives":

> In order to give meaning to the achievement of independence to the people of Zimbabwe, the country's socio-economic system must be transformed through rapid economic growth, full employment, dynamic efficiency in resource allocation, and an equitable distribution of the ensuing benefits. To achieve those objectives the Government of Zimbabwe shall adopt a policy on cooperatives whose broad aims are:
>
> - to enable the people of Zimbabwe to achieve economic power and through this power achieve control of socio-economic institutions;
> - to eliminate the exploitation of man by man;
> - to make the people of Zimbabwe self-reliant in skills, management, goods and services, and establish in themselves a sense of confidence, initiative and high development aspirations;
> - to provide an opportunity to develop community and collective ways of living that provide a sound base for socialism and national solidarity.'[6]

Indeed, "cooperatives (that is, those cooperatives registered under the Cooperative Societies Act and are based on the cooperative principles) in Zimbabwe are seen as some of the instruments of development and socialist transformation". However, in view of the fact that cooperatives are being formed and "co-ordinated" in an almost untouched pre-1980 economic substructure, and that there appears to be no other socialist "instruments" in sight, one is tempted to view cooperatives as some of the major, if not only, instruments being employed to bring about socialist development. Given the importance attached to cooperatives, it is necessary to make an analytical assessment of the effectiveness of cooperativization as a strategy for socialism in Zimbabwe.

The main objective of this paper, therefore, is to analyse how the transition to workers' control over industrial enterprise via the cooperative institution is brought about in the mining sector i.e. how both labour and the State interact with multinational capital in their efforts to bring about structural change. Similar analyses need to be made for other sectors of the economy if at all valid conclusions and recommendations are to be made about cooperatives.

As a "case study" in cooperative assessment, the mining sector has been chosen because it represents a vital part of the indigenous economy in which there are significant levels of capitalist foreign ownership and control. In fact, "to talk of the mining industry in Zimbabwe is to refer largely to an enclave which is ... a powerful engine of capitalism operated and owned by monopoly mining corporations that have become household names in this subcontinent".[7]

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5 e.g. "Master Plan" for cooperatives, creation (and subsequent restructuring) of the Ministry of Cooperative Development, conferences on cooperatives, seminars on cooperative legislation, formation of cooperative organisations like OCCZIM, etc.

6 N. C. G. Mathema, *Ibid*., p.19.

7 L. M. Sachikonye: *State and Monopoly Capital in Mining in Zimbabwe:* Some Problems for Research, February, 1985, p.1.

Further, the chrome mining and processing subsector has been selected in view of the preponderance of operational cooperatives carrying out mineral extraction on contract basis. Actually, "of the 44 mining cooperatives registered as at 31st January, 1988, eleven (11) were still prospecting, four (4) were engaged in gold panning, one (1) in gold dump retreatment, and twenty-eight (28) in chrome mining. This means that of the 33 operating cooperatives, 85% (28) were engaged in chrome mining."[8] Over 2 000 people have been organized into chrome mining cooperatives and, in fact, reports and "success stories" on mining cooperatives refer, almost exclusively, to chrome mining cooperatives.[9]

In Zimbabwe chromite deposits are mostly found along a geological feature called the Great Dyke and their extraction is carried out by transnational corporations (Anglo American Corporation and Union Carbide Corporation), individuals (tributors) who employ labour, and mining cooperatives. Mining cooperative involvement is concentrated in operations on the North Dyke/Mutorashanga, Ngezi and Lalapanzi in the Midlands province. In the south (Shurugwi and Mberengwa areas), chrome mining operations are undertaken almost exclusively by the mining subsidiaries of the TNCs.

All chrome ore is mined and processed into ferro-alloys such as high-carbon and low-carbon ferrochrome, ferrosilicon chrome, etc, for export, so that ferro-alloys are a major mineral foreign exchange earner. For example, the main foreign currency earners during the first eight months of 1987 were flue-cured tobacco and ferro-alloys, which accounted for 13,2% and 11,8% of total exports respectively. ("Stats Flash", *The Herald*, February 5, 1988 p. 1.)

The main problem in relation to cooperatives is their apparent vulnerability, lack of autonomy, excessive technological dependency, etc, due to the following realities:

- Most of the claims are owned by the transnational corporations (TNCs) with tributors and mining cooperatives being contracted (by the TNCs) to work some of the claims. A few mining claims are owned by the Zimbabwe Mining Development Corporation (ZMDC), a State mining parastatal. The mobilization of labour into mining cooperatives is the duty of the ZMDC. A vast majority of the mining cooperatives do not own mining claims.
- All the chrome ore produced is for the ferrochrome smelters owned and controlled by the same TNCs. The cooperatives sell all their ore to the smelters while they have nothing to do with the processing of the chrome ore. Chrome ore prices are not determined on a "free market" basis and bargaining for prices with TNCs is done by the ZMDC on behalf of the cooperatives.[10]
- The State, mainly through the ZMDC and the Mining Engineering Department, provides both managerial, financial and technical assistance to the mining cooperatives. In some cases the TNCs provide equipment and consumables (e.g. explosives) to mining cooperatives on credit to be repaid after the sale of the chrome ore. The implication is that apart from technological dependence there might be powerful oppositional and manipulative forces pledged to prevent any innovations

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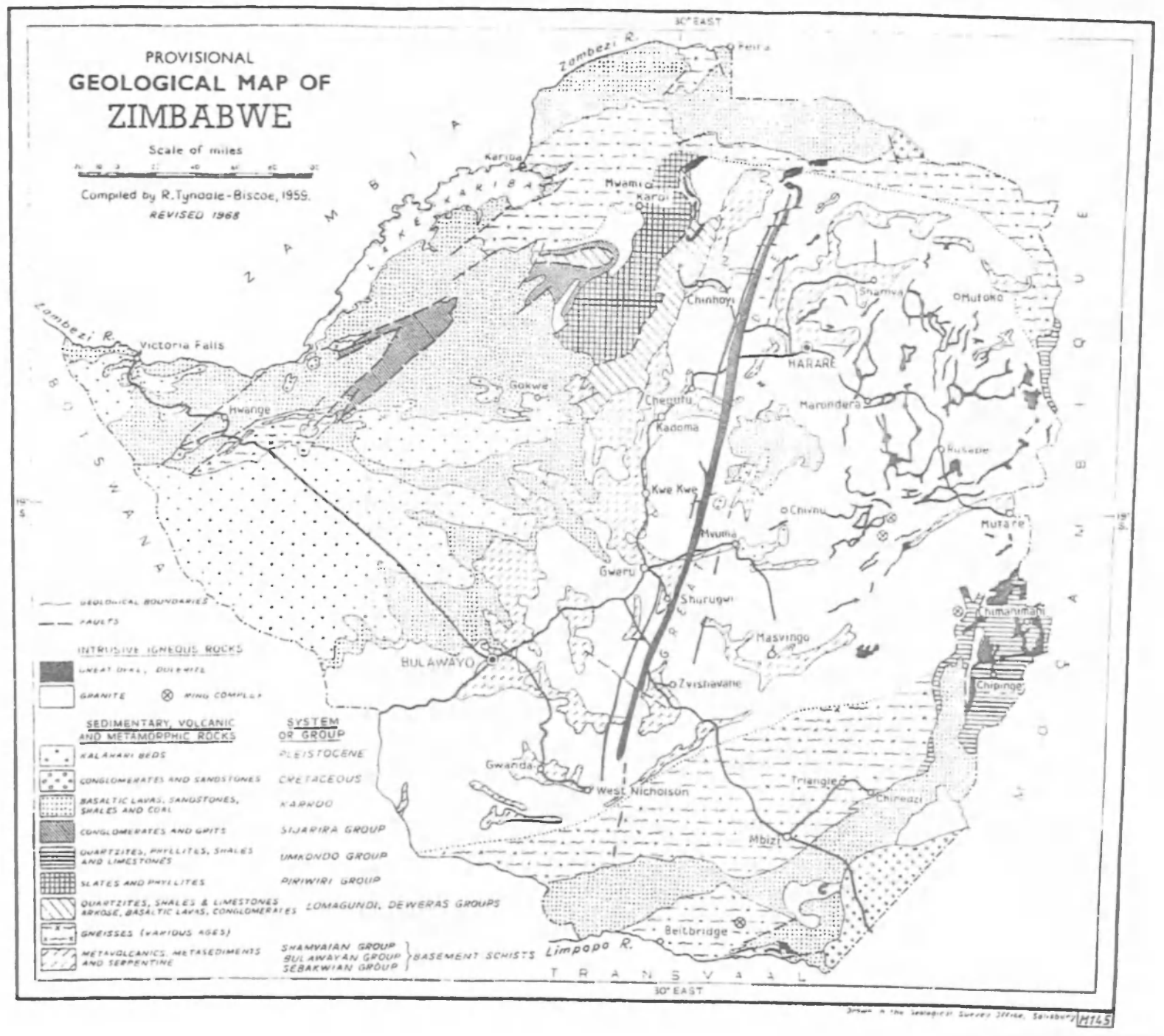
8 H. Chiwawa: "An Evaluation of the Performance of Mining Cooperatives in Zimbabwe", in A. Agren (ed.), *Quantitative Methods In Socio-Economic Planning - Training Programme*, March-June, 1988, Nov. 1988, p.6.

9 e.g. "Mine cooperatives earn more than $5m", in *The Herald*, January 8, 1988.

10 ZMDC Monthly Report on Mining Cooperatives, June 1986, p.1.


PROVISIONAL
GEOLOGICAL MAP OF
ZIMBABWE
Scale of miles
Compiled by R. Tyndale-Biscoe, 1959.
REVISED 1968
30° EAST
Zambezi R.
Victoria Falls
Kariba
Karoi
Chinhoyi
Shamva
Mutoko
HARARE
Marondera
Rusape
Chivhu
Mutare
Kadoma
Kwe Kwe
Gokwe
Hwange
Gwelo
Shurugwi
Masvingo
Zvishavane
Chimanimani
Chipinge
BULAWAYO
Gwanda
West Nicholson
Triangle
Chiredzi
Mbizi
Beitbridge
Limpopo R.
MOZAMBIQUE
ZAMBIA
BOTSWANA
RHODESIA
TRANSVAAL
GEOLOGICAL BOUNDARIES
FAULTS
INTRUSIVE IGNEOUS ROCKS
GREAT DYKE, DOLERITE
GRANITE
RING COMPLEX
SEDIMENTARY, VOLCANIC AND METAMORPHIC ROCKS
SYSTEM OR GROUP
KALAHARI BEDS — PLEISTOCENE
CONGLOMERATES AND SANDSTONES — CRETACEOUS
BASALTIC LAVAS, SANDSTONES, SHALES AND COAL — KARROO
CONGLOMERATES AND GRITS — SIJARIRA GROUP
QUARTZITES, PHYLLITES, SHALES AND LIMESTONES — UMKONDO GROUP
SLATES AND PHYLLITES — PIRIWIRI GROUP
QUARTZITES, SHALES & LIMESTONES ARKOSE, BASALTIC LAVAS, CONGLOMERATES — LOMAGUNDI, DEWERAS GROUPS
GNEISSES (VARIOUS AGES)
METAVOLCANICS, METASEDIMENTS AND SERPENTINE — SHAMVAIAN GROUP, BULAWAYAN GROUP, SEBAKWIAN GROUP } BASEMENT SCHISTS
M145

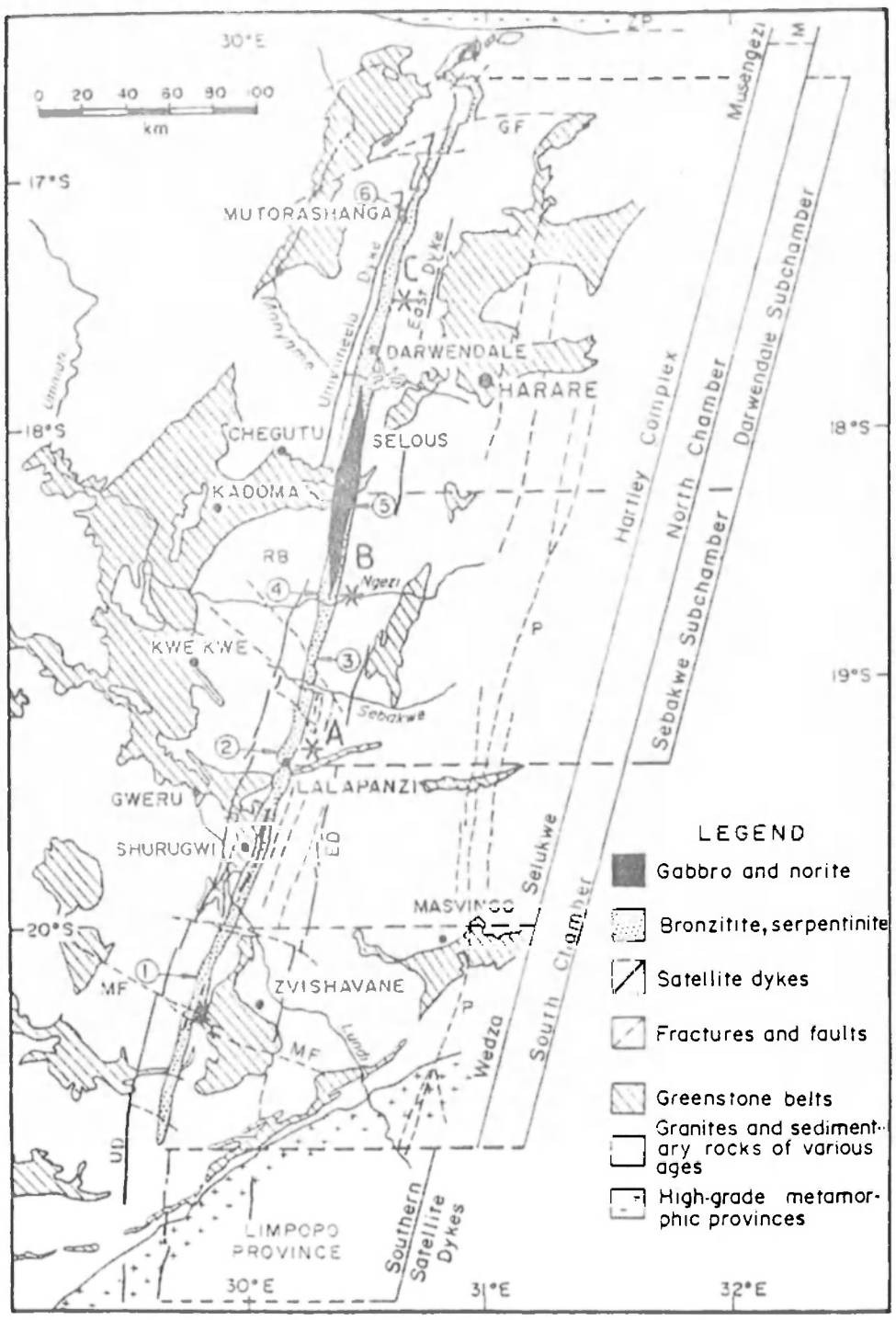


Fig. 1 Simplified geological map of central Zimbabwe Craton showing Great Dyke and its satellites and associated fractures. Subdivisions of Great Dyke are discussed in section *Structure of magma chambers*. Wedza, Selukwe, Hartley and Musengezi Complexes are shown together with subdivision proposed in this study. Circled numbers refer to positions of gravity profiles shown in Fig. 19. Abbreviations: ZP, Zambezi Province; GF, Gurungwe Fault; MF, Mchingwe Fault; P, Popoteke Fault Set; UD, Umvimeela Dyke; ED, East Dyke; M, Mvuradona Chamber (provisional); RB, Rhodesdale Batholith

Source: Magmatic Sulphides: The Zimbabwe Volume. Institution of Mining and Metallurgy. London. 1989. p.2.

* Cooperative chromite mining areas:

A - Lalapanzi (2 cooperatives)
B - Ngezi (4 cooperatives)
C - Mutorashanga & Darwendale (22 cooperatives)

and the wider prospect of genuine industrial democracy among the mining cooperatives.

- The other aspect of the problem is that whilst cooperatives are required to provide their own housing, education, health, etc, facilities, in most cases the average monthly income per cooperative member is lower than the national minimum wage for the mining sector.[11] Again, the role of women in mining cooperatives has not been explained in various reports on mining cooperatives so that the division of labour between men and women in mining cooperatives, together with its socio-economic impact, has remained unknown.

THEORETICAL DEBATE

There are two major interpretations of the above problem, broadly divided into neoclassical and Marxist theories.

Neoclassical Approaches

The neoclassicals largely analyse an economy where market choices by consumers are determined by a coherent subjective preference ordering, with decisions concerning what and how to produce being governed by the desire of suppliers to maximize profit. Buyers and sellers in total form a market so large that no individual can influence prices through their own behaviour of consumers and firms in a more or less competitive environment, where the forces of supply and demand create a unique equilibrium price structure at which the quantities demanded and supplied are equalized so that markets are cleared. Resources are efficiently allocated because, given existing tastes and income distribution and the technical relationship between inputs and outputs, it is impossible to increase aggregate output through reallocation. It is argued that scientific objectivity prevents any choice between outcomes that improve the position of one person or "class" at the expense of another. A competitive capitalist economy, therefore, appears to satisfy the criterion of "economic efficiency". Consequently, the neoclassicals stress the significance of the pursuit of individual self-interest in markets free from government intervention for promoting the well-being of all.[12]

A number of "radical" critiques of capitalism have developed from within the neoclassical paradigm. The neoclassical model is based, despite numerous qualifications, upon the mode of perfect competition in which rational consumers indicate their preferences to profit-maximizing producers, through the medium of price. Considerable attention has been devoted to the limitations of the neoclassical model and it is accepted that the market behaviour of individuals is unlikely to generate the norm of ideal output if certain "market failures" occur. Accordingly, the following principal acknowledged "market failures" can be viewed as the main causes of developments in the chrome mining industry of Zimbabwe:[13]

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11 H. Chiwawa: *Ibid.*, p.14.
12 B. Burkitt: *Radical Political Economy – An Introduction to the Alternative Economics*, Chapter 8.
13 J. H. Cobbe: *Government and Mining Companies in Developing Countries*, pp.11-14.

Market Concentration

The persistence of oligopolies is said to be due to barriers to entry and limit pricing. The effectiveness of barriers is ensured by a pricing policy in relation to the return obtained on capital which adjusts prices downward sufficiently from the static profit-maximizing level to make the net gain to any attempt to overcome the barriers appear not worthwhile to the new entrant. Access to the raw material deposit is not the only barrier to entry but also technology and expertise and size itself. The existence of technical economies of scale which appear to be common in mining, and some deposits richer than others are enough to explain historical appearance of concentration. Thereafter, the control of the technical, exploration and marketing skills and the related access to capital are adequate to explain why the majority of newly exploited deposits are in the hands of one of the existing large firms.

Uncertainty Inherent in Prospecting for Minerals and the Costs Associated with it

Foreign firms should continue to be involved in resource extraction in Less Developed Countries (LDCs) because mineral exploration and prospecting is not a cheap activity. A large firm able to search in a number of countries is taking some risks by gambling a certain amount of money at a time with a one in two chance each time of no return, but not an unacceptable risk if the payoffs to winning are good enough and the gamble can be repeated many times. The large firms can repeat it many times, both financially and structurally, in that their operations can be worldwide. The situation for an individual LDC is quite different because it only takes the gamble a limited number of times, which makes the risk less acceptable, and the lower wealth position of the LDC accentuates the unacceptability of the risk. It is also doubtful, the argument goes, that an LDC government can, even at prohibitive cost, get as good a job of exploration done as can be done by a mining company. This is because the mining companies have a near monopoly of talent and experience in the area, since they can offer continuous employment and attractive terms of service. Therefore, it is concluded, by getting a mining company to do the exploration and survey work for it, the LDC can place the risk involved wholly on the foreign mining company; the price to be paid will inevitably be future foreign involvement in mining.

According to these arguments, there should be dominance and continuous involvement of TNCs in the Zimbabwean chrome mining industry as a result of historical market concentration, uncertainty inherent in prospecting for minerals as well as poverty of the Government.

Vertical Integration

This is another possible explanation which is said to be brought about by a number of factors such as the following:

- The contention that there are genuine cost reductions for the vertically integrated group over the costs incurred by separate entities performing the same functions. Such cost reductions may arise from purely technical considerations or from logistical, administrative and organisational factors.

- The avoidance of the exposure to risk and particularly price fluctuations. This motive is said to be present on both sides. The miner, by vertically integrating with a fabricator, sells products with relatively stable prices while the fabricator stabilizes the cost of his raw material. Vertical integration thus permits for greater predictability of cash flow, costs and receipts for the operation as a whole, at the same time reducing their variability. This reduction in the variability is also seen as reducing the riskiness associated with the enterprise as a whole, something which might improve its creditworthines
- The symmetrical problems of market access and security of supply. Vertical integration is seen to assure a market for output to the extractive enterprise, and security of supply to the downstream enterprises. Another strategy to achieve this is the signing of long-term contracts between the extractive enterprise and downstream enterprises. Long-term contracts are often considered a form of loose vertical integration in that the long-term supply contract may be coupled with the supply of finance to the extractive firm, to be repaid from the proceeds of the supply contract. It is generally believed that security of supply is a more important motive for these arrangements than avoidance of price instability.

The production and exchange relationships between the TNCs, their mining subsidiaries, tributors and chrome mining cooperatives can, therefore, be "explained" in terms of the above motives for vertical integration.

The State

It is accepted that when market failures occur, such as monopoly and monopsony, they can be corrected only by government intervention. There are differences concerning the practical importance of this observation, but the neoclassicals' concentration upon market analysis implies that failures constitute essentially minor exceptions capable of correction by an enlightened state.[14] It is argued that Government determines, or at least influences the regime under which private companies operate – the commercial law, the labour law, the tax law, the trade regime, etc. The private companies seek to attain their objectives subject to the constraints imposed by their environment, and the details of their behaviour will depend on the environment in which they find themselves. The companies, however, are said not to take the aspects of the environment as given, but attempt to alter them if alterations will be to their advantage and appear feasible. Generally, it is maintained, there is a bargaining situation existing between the companies, which exist in an environment partially controlled by Government, and the Government which influences the environment. The role of Government departments and parastatals in the chrome mining sub-sector is, therefore, viewed in this context.

Although the above explanation is "radical" within the neoclassical school, and may be valid, it is nothing more than a mere description of the situation. It takes conditions as given and reduces the issue to a description of the workings of monopolistic or oligopolistic and monopsonistic structures in a capitalist economy. The theory of the workings of a capitalist system cannot explain its origins. Capitalism, once in existence, has a logic which can be captured by abstract theory, but its origins are a process that must be explained in terms of

14 B. Burkitt: *Ibid.*, p.144.

the historical circumstances under which it occurred. The essence of the problem, therefore, is to explain how developments in the Zimbabwean chrome mining industry came into being so that a conceptual framework which goes beyond mere description of the situation is required. Since an account which relies on grossly observable variables is inadequate, one should go beyond the quantitative appreciation of the economic and social effects of capitalism. This then brings us to what may be broadly considered the Marxist view on the subject.

Marxist Perspectives

The Marxist paradigm is both an explanation and a critique of capitalism which, based on its economic interpretation of history, locates capitalism as one phase in human history. The Marxist theory of history centres around the unique significance of labour, which comprises the real cost (i.e. expenditure of mental and physical effort) of transforming nature to produce useful objects. Labour is social, involving the interdependence of many, so that analyses of economic agents abstracted from their historical environment (e.g. the neoclassical concepts of profit and utility maximizers) are invalid. History is a process of continuously creating, satisfying and recreating humanity's needs through labour. The Marxian view of history holds that historical developments are not random but can be analysed systematically through an economic model, whose base consists of two propositions:

- Modes of production are the fundamental determinant of social structures which breed actions, attitudes and civilization. A mode of production is composed of forces of production (i.e. productive technology) and relations of production (i.e. the social relationships under which the surplus is produced and its use controlled). This economic "base" of society determines non-economic institutions and processes, which constitute the "superstructure".
- Modes of production possess a dynamic of their own. They change according to their inherent functioning to produce their successors. Major historical changes occur when the relations of production become a hindrance to developing the forces of production. Each configuration of the relations of production initially stimulates productive forces before becoming an obstacle to their continued expansion. Therefore, it is believed that historical evolution is propelled by economic change.[15]

History is also regarded as a series of class struggles (e.g. masters versus servants, lords versus serfs, capitalists versus workers), each successive stage evolving from its predecessor. The theory of social class, therefore, complements the economic interpretation of history, as classes are the crucial actors propelling historical development. The nature of class control over production of the surplus is the basic relationship upon which the social structure rests.

The classes are groups of people sharing a common relationship to the means of production. In class-divided economies, there are two basic classes : the owners and non-owners of the means of production. Thus the class structure of capitalism, for example, may be reduced to the capitalists who own, and the workers who do not own, the means of production. The position of these two classes in the productive process makes their interests increasingly

15 B. Burkitt: *Ibid.*, p.36.

antagonistic, because those owning productive property can exploit those without it. Exploitation refers to the mechanism whereby the dominant class extracts surplus labour from the subordinate class. Workers, in our example, retain only part of their output, the rest being appropriated by capitalists. The resulting class conflict generates economic and political mechanisms that tend to make the mode of production revolutionise itself from within – to bring about a different one, e.g. socialism.

Cohen (1978) identifies two equally standard but logically distinct Marxian definitions of capitalist society:

- The first definition features the structural property of capitalism by reference to its dominant production relation; it is the society whose immediate producers own their labour power and no other productive force. It is the economy of free labour, free from serf- or slave-like burdens, free (bereft) of means of production. This is the structural definition.
- The alternative, or modal definition, refers to the purpose of capitalist production, not the structure in which it occurs. It defines capitalism as the society whose production serves the accumulation of capital. The point of production under capitalism is to use exchange-value to produce more exchange-value, and then to use the additional exchange-value to produce still more, and so on.[16]

He then argues that societies falling under the structural definition should also satisfy the modal definition, and vice versa because:

- If the producers are free labourers, production is for the sake of accumulating capital; and
- If production is for the sake of accumulating capital, the producers are free labourers.

It is maintained that, although there are minor exceptions (e.g. simple commodity production, slavery in USA, etc), (1) and (2) are true when asserted of whole economies.[17]

Seen in a historical perspective, capitalism first emerged in Europe. It was transplanted, partly grown, to the colonies of European settlement (America, Australia, etc) and developed on an independent basis in Japan. In the rest of the world, however, capitalism came from outside, an alien feature introduced, frequently, at the point of a gun. It is this spread of capitalism to the rest of the world (including Zimbabwe) especially in the 20th century that the term "imperialism" is used to describe.

Writers of theories of imperialism differ from each other on many issues, but they share a common set of assumptions. All assign a central role to the evolution of the economic system, and agree that imperialism must be explained in terms of the development of capitalism. This approach is based on the method of economic interpretation of history, and imperialism is seen in the context of the history of the world capitalist system.[18]

It is generally observed that the 20th century has seen a number of developments in the world capitalist system especially the rapid growth in international investment by major firms which made them into "multinationals" operating on a worldwide basis; and the division of the capitalist world into advanced ("centre") and the underdeveloped ("periphery") countries which differ from each other not only in income levels, but also in

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16 G. A. Cohen: *Karl Marx's Theory of History: A Defence*, p.181.
17 G. A. Cohen: *Ibid.*, p.182.
18 A. Brewer: *Marxist Theories of Imperialism – A Critical Survey*, pp.18-23.

almost every other aspect of their economic and social structure. During this period the world capitalist economy has been much more integrated than ever before, despite the achievement of formal independence by most underdeveloped countries (UDCs), as the advanced countries contain the headquarters of the main centres of technological development.

The problems arising from the division of the capitalist world into "centre" and "periphery" economies and the impact of the relationship between these economies on the development and underdevelopment of the latter were largely discussed by the "Dependency School".[19]

At a general level, therefore, the Marxist interpretation goes, the Zimbabwean economy is a "periphery" economy in the world capitalist system and its operational problems are a result of its relationships with the "centre" economies. At a more specific level, developments in the chrome mining industry merely reflect this relationship.

The (neoclassical) argument that ownership of the mineral industry in UDCs is foreign due to capital shortage and technological backwardness in these countries is accordingly dismissed as rather too simplistic. Seen in historical perspective, foreign ownership in these industries is the effect of profound changes that took place in the industrial organization characteristic of the world capitalist system. It is associated with the transition from a capitalism based on companies that are relatively small, unintegrated, competitive, or local or at most national in scope, to a capitalism based on companies that are large, integrated, monopolistic and transnational in scope while being based in the centre countries. Foreign ownership of the mineral industry in the periphery is, therefore, the logical result of the emergence and spread of transnational monopoly capitalism based in the centre.

The case of the Zimbabwean chrome mining industry can also be explained in terms of "Corporate Imperialism", which refers to a system that has two basic characteristics:[20]

- Fundamental power in this world system is held by the owners and managers of capital, who exercise their power over other groups and institutions in order to appropriate surpluses and accumulate further capital. The other groups – government bureaucracies, workers, peasants, the unemployed, etc. – are to a greater or lesser degree dominated, dependent, exploited, and underdeveloped.
- The second crucial feature is that these relationships are institutionalised within the framework of large, integrated TNCs. The TNCs as a group constitute the institutional base of the system; individually, they are its principal instruments.

A further argument is that integration into the world capitalist system has meant the formation of particular economic and social structures in UDCs, but the precise nature of these is frequently determined by the nature of a society's class structure. Thus, the other problem of the "external impact" on underdeveloped economies concerns the conditions under which the process of capital accumulation takes place and its impact on the class structure – the problems of the process of surplus extraction, the economic role of the state, the allocation of the labour force, e.g. the changeover from small proprietors to wage labourers, from rural workers to urban workers, etc. The state under capitalism, Marxists

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19 P. T. Mkandawire: "Accumulation on a World Scale", in P. Limqueco and B. McFarlane (eds.), *Neo-Marxist Theories of Development*, p.50ff.

20 N. Grivan: *Corporate Imperialism: Conflict and Expropriation - Transnational Corporations and Economic Nationalism in the Third World,* pp.11-12.

maintain, serves the interest of the capitalist class. Its (the state) interests are demands of "business" and "industry" which, by a deft equation, are deemed to be "national" needs.

Rather than merely focusing on the "bargaining relationship" (as does the neoclassical theory), "any concrete analysis of the relationship between the state ... and the natural resource MNCs must ... incorporate an examination of the nature of the state ... with a view to illuminating its concrete class character ..."[21]

The role of the State and significance of various Government policies in the chrome mining industry, therefore, need not be discussed in descriptive terms, but should be analysed to show their impact on the class (and ownership) structure.

Towards A Working Hypothesis

The replacement of capitalism by socialism does not occur spontaneously. Capitalism can only be ended through a socialist revolution that deprives the bourgeoisie of political power and the possibility of oppressing and exploiting the working people. A socialist revolution is a radical "smashing" of the old, capitalist relations and the establishment of new, socialist relations based on the social ownership of the means of production.[22] A socialist revolution, therefore, is said to have occurred when the process of transferring power from the bourgeoisie to the working classes (i.e. the proletariat and the peasantry) with the closely related and indispensable transformation of the state apparatus, has been accomplished.

The transition to socialism does not (and cannot) take the same course as the transition from feudalism to capitalism.

> The distinguishing characteristic of pre-Marxian or Utopian socialism was the deliberate selection . . . of a road to socialism similar to that which had led from feudalism to capitalism. Small socialistic communities were to be, and in many cases were, established. These were to be both schools of socialism and bases from which the new society would spread, undermining and eventually overwhelming their capitalist matrix.[23]

It was observed that this strategy could not work largely because the small socialist communities - unlike capitalism in the interstices of feudal society - had neither the ability nor the desire to compete against capitalism on its own terms so that the obstacles to their survival (let alone development) were so enormous that they were in effect doomed from the outset. Socialism, therefore, cannot take root and grow within the confines of capitalist society, as capitalism had done under feudalism. Could it be said that this is the strategy being adopted, not only in the chrome mining industry, but also in the entire Zimbabwean economy?

In the world capitalist economy the actions of UDC governments, reactions by TNCs, and further responses of the governments, form a continuous dialectic that gives rise to modifications in the form, but not necessarily the essence, of the system of corporate imperialism. Thus, new forms of surplus extraction have been developed that can satisfy "nationalistic" feelings in the underdeveloped world without effecting any significant changes in the international sharing of surplus or in the effective control over the means

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21 C. Fortin: "The State, Multinational Corporations and Natural Resources in Latin America", in J. J. Villamil (ed.), *Transnational Capitalism and National Development*, p.213.
22 G. A. Kozlov: *Political Economy: Socialism*, p.18.
23 P. M. Sweezy: "The Transition to Socialism", in P. M. Sweezy and C. Bettlehelm: *On the Transition To Socialism*, p.110.

of production internationally. Could it be said that this is happening in the chrome mining industry where labour has been mobilised and organised into new institutions of national priority – cooperatives?

Accordingly, can one say TNCs continue to exploit, not only their workers, but also mining cooperatives, with the State playing a facilitative role? Further, could cooperativization be a convenient way of lowering the raw material costs and social cost of labour to the TNCs with the State subsidising the TNCs' wage bill through technical, financial and managerial assistance to cooperatives?

Finally, under these circumstances, could one conclude that, although the internal operations of mining cooperatives may be "socialist", far from being powerful instruments to bring about significant changes in the ownership structure and socialist transformation, they are much more convenient forms of exploitation of labour by foreign monopoly capital?

Specific Study Objectives

In an attempt to shed light on the above questions, the study sought to:

- Examine the root causes of the present situation in the chrome mining and processing sub-sector.
- Analyze the working relationships between cooperatives, tributors and mining TNCs, and determine their impact on the ownership structure.
- Investigate the internal operations of mining cooperatives, including the role of women.
- Examine the role of the State and implications of its short- and long-term policies and make recommendations.

Methodology

To meet the above specific study objectives:

- Use was made of mostly ZIDS library sources on the theoretical aspects of the study.
- Secondary and primary data on the subject were collected from both published and unpublished official documents, and through structured interviews and discussions with all the authorities concerned.
- It was also necessary to rely on observations from site visits to both (some) chrome mining and (all) smelting operations. Consequently, field work was conducted as from August 21, 1988 to September 26, 1988.
- No sampling was conducted, given the small size of the population (28 cooperatives) and the difficulties in generalising about cooperatives due to the peculiar differences between them, emanating from their history, geographical location, modus operandi, etc.
- However, it was not possible to interview each and every member of the cooperatives largely because of the time constraint and limited (financial) resources.

- Consequently, a questionnaire was administered to, and discussions held with the Management Committee of each cooperative as a group, based on the (possibly unrealistic) assumption that their views represented those of the entire membership. In addition, since most of the information sought was of a quantitative nature, where necessary, recourse was made to actual inspection of available cooperative records to verify parameters and statistics.
- A "bottom-up" approach was adopted, with findings at the cooperative level serving as the basis for discussions at higher levels in order to confirm, clarify, elaborate, cross-check, etc, the data. Where necessary some technocrats were relied upon for detailed explanations of certain technical concepts.

PART II

SUMMARY OF THE FINDINGS

Fundamental Causes of Cooperativization

Chromite resources of Zimbabwe occur as podiform deposits associated with the older rocks in the country and as stratiform deposits of the Great Dyke. The chromite mineralization is thus classified into two major forms – the huge podiform deposits of the "Shurugwi/Inyala Complex" in the south and the stratiform deposits of the Great Dyke, the "Dyke Complex".[24]

The podiform deposits at Shurugwi have been exploited since 1906, and although some new podiform deposits have been found and worked in later years, resources are believed to be limited. The Great Dyke, a stratiform deposit of chromite that extends over a distance of more than 500 km, offers the best potential for future exploitation of chromite in Zimbabwe.

The Great Dyke is

> in reality not a dyke at all (but) a geologial phenomenon (which) is unique in that it, alone among the world's larger ultramafic complexes, contains high-grade metallurgical chromite. It strikes north-north-east for 540 km centrally across (Zimbabwe) and varies in width between 3 km and 11 km. For the most part the Dyke is a positive topographic feature, but only spectacularly so in the northern third of its length where it forms the (Mvurwi) range of mountains in which the heavily wooded pyroxenite ridges contrast strongly with the barren, grassy, serpentinite terrain. In the extreme south it terminates in a smooth curve, but towards the northern end the overall straight character is lost, and beyond a dextral fault gap the Dyke is bent into an S-curve finally trending east along the Zambezi Escarpment ... Age emplacement of the Great Dyke has been well established at about 2 500 Ma ago by radiometric and palaeomagnetic methods ... An idealised unit (of the Dyke) would contain basal dunite with a cumulate chrome seam in the lower part, overlain by olivine rocks that contain progressively more pyroxene upwards to be topped by a thick orthopyroxene layer composed almost exclusively of enstatite ... The ... cross-section shows the Dyke to be symmetrical and funnel-shaped with the walls becoming increasingly steep with depth . . .
>
> The immense mineral wealth of the Great Dyke is in its chrome ore resources and the platinum metals horizon. There has been chrysotile asbestos production and magnesite has been exploited at the southern end in the Wedza Complex. Along both flanks of the northernmost or Musengezi Complex there are very extensive semi-lateritized serpentinite deposits, at an altitude of 1 500 metres, containing one percent or more of nickel. Apart from removal by erosion and fault displacements, chrome seams occur continuously throughout the entire extent of the four complexes. The number of seams known in each complex, from north to south respectively, is seven, eleven, seven, six and there may be others that have not been discovered ... The chromite layers may exceed 30 cm in width but the general average is of the order of 10 cm. Taking 6 km as the average width of the complexes and using the other dimensions quoted, the potential chromite resources of the Great Dyke are a staggering 10 000 million tonnes ... In regard to quality, the chromite shows a progressive increase in chromic oxide content and chromium/iron ratio downwards reaching a maxima of some 60 percent and a ratio of 4:1 but the untreated ore from the two upper seams averages 47 percent chromic oxide and has a ratio of 2,2:1.[25]

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24 Mr. Marima, Chief Minerals Development Officer, Ministry of Mines, *Interview*, 12/10/88.
25 Ministry of Mines: *Geological Survey Bulletin* 80, pp.42-46.

"The determining geological factors decisive in mine capacity dimensioning include the size of the deposit to be exploited and the position, geometry and regularity of the mineralization."[26] Massive stoping methods are employed in extracting podiform deposits while the resue stoping method, together with some trenching/opencast mining, is used to recover ore from the stratiform deposits. The mining sector is generally characterised by substantial economies of scale, with larger-scale mines producing at lower unit costs than smaller operations. Mining of the podiform deposits is undertaken at a larger scale by the mining subsidiaries of Anglo American Corporation Limited and Union Carbide Corporation Limited, Zimbabwe Alloys Mines Limited (ZIMALLOYS) and Zimbabwe Mining and Smelting Company Limited (ZIMASCO) respectively. The stratiform thin-seam mining is undertaken by the above TNC mining subsidiaries, private tributors and cooperatives on the North Dyke near Mutorashanga, in the Darwendale and Ngezi areas, and at the southern end of the Hartley Complex at Lalapanzi. Whilst podiform deposit mining is less labour-intensive, cheaper, with higher labour productivity, stratiform deposit extraction is more expensive, very labour-intensive, with very low productivity of labour. Development work is much higher in thin-seam mining than in thick-seam operations and there is need to invest in a very efficient hoisting system for thin-seam mining. In general, this means that the longer-range average-cost curve, reflecting the effects of of economies of scale, is different for podiform and thin-seam (stratiform) operations.

For thicker-seam mining, the threshold capacity at which the minimum unit cost level is reached is higher than for thin-seam mining. It is on thin-seam mining that our analysis will exclusively focus.

In 1984/85, mining companies in the North Dyke either reduced their operations or closed down mining operations and put their mines on a "care and maintenance basis". This was largely because of the:

- increasing costs of hoisting ore from underground as depth increased.
- increasing pumping costs as there was more underground water with increases in depth.
- rising costs of plant and equipment.
- high power tariffs.

At the same time there was Government pressure on companies to:

- pay the minimum wage;
- employ contract labourers on a permanent basis.

These rising costs of production not only meant reduced profits or losses for the mining companies but also a more expensive feed material for the smelters, who could not push on these costs to ferrochrome consumers on the world market and, therefore, also sustained lower profits or losses.

In Marxian terms, the above "crisis of capitalism" is initially explained in terms of the Law of the Tendency of the Rate of Profit to Fall:

> Assuming a given wage and working day, a variable capital, for instance of 100, represents a certain number of employed labourers ... Suppose 100 pounds are the wages of 100 labourers

26 R. Noetstaller: *Small-Scale Mining -- A Review of the Issues,* p.42.

for, say, one week. If these labourers perform equal amounts of necessary and surplus-labour, if they work daily as many hours for themselves, i.e. for the reproduction of their wage, as they do for the capitalist, i.e. for the production of surplus-value, then the value of their total product = 200 pounds, and the surplus-value they produce would amount to 100 pounds. The rate of surplus-value, s/v, would = 100%. But . . . this rate of surplus-value would nonetheless express itself in very different rates of profit, depending on the different volumes of constant capital, c, and consequently of the total capital, C, because the rate of profit = s/C. The rate of surplus-value is 100%:

If c = 50, and v = 100, then p' = 100/150 = 66,2/3%
" c = 100, and v = 100, then p' = 100/200 = 50%
" c = 200, and v = 100, then p' = 100/300 = 33,1/3%
" c = 300, and v = 100, then p' = 100/400 = 25%
" c = 400, and v = 100, then p' = 100/500 = 20%

This is how the same rate of surplus-value would express itself under the same degree of labour exploitation in a falling rate of profit ..."[27]

The above example shows only the effects of variations in c on the rate of profit and might serve to explain the effects of increasing hoisting, pumping, energy, etc, costs on the rate of mine profit. However, there was statutory pressure to increase v as well, implying a lower rate of surplus-value and degree of labour exploitation. The result was that instead of a "tendency", the profit actually fell and losses were incurred, bringing about a "crisis".

The most general counter-balancing forces against the falling rate of profit are:

- Increasing intensity of exploitation.
- Depression of wages below the value of labour-power.
- Cheapening the elements of constant capital.[28]

We will then examine how the chrome mining and smelting companies employed the above counteracting influences and other instruments in resolving the crisis, particularly focusing on the key role played by mining cooperatives, in subsequent sections of this paper.

The Lowering of Labour Costs

Employment

As explained earlier, in 1984/85 when costs of production were increasing and the mining companies were making losses, there was Government pressure, through the Industrial Relations Department of the Ministry of Labour, Manpower Planning and Social Welfare, as well as the mining labour movement demands, through the Associated Mine Workers' Union of Zimbabwe, to ensure conformity with statutory employment regulations.

In addition to the payment of the minimum wage to all their already employed workers, the mining companies were required to put an end to the "embarrassing and exploitative" system of contract labour which was still prevalent five years after Independence. Under this system, the workers would produce chrome ore individually, on contract basis, and then sell the ore to the mining companies at largely the buyers' prices. This system was also known as the "madobadoba" system as it included the pig-rooting and even hand-sorting of out-cropping seams.

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27 K. Marx: Capital, Volume III, p.211.
28 K. Marx: *Ibid.*, pp.233-236.

Contract labour was strongly opposed on the grounds that:

- The prices paid for the contractors' ore were too low and the workers' earnings were far below the minimum wage.
- There was no security of employment on the part of the labourers and payment on tonnage, and not on hours worked, was tantamount to the archaic piece rate system.
- These workers had no (a) workers' compensation scheme, (b) pension, medical aid and insurance, (c) adequate sanitation and housing or (d) other fringe benefits from employment.

Consequently, the companies were required to employ these workers on a full-time basis and pay the minimum wage. The mining companies, however, objected to these demands and requirements. Their argument was that since they already had "excess" labour on their mines which they could not afford to pay the minimum wage, it was virtually impossible to employ contract workers on full time and pay them a minimum wage. Their counter-proposal, therefore, was to be allowed to retrench their excess labour, continue with the contract labour system, or stop it and throw many people out of employment.

A committee, chaired by the Ministry of Mines as the "arbiter", was set up to look into the matter. The other members of this committee included representatives from the Ministry of Labour, Manpower Planning and Social Welfare's Industrial Relations Department, ZMDC, Associated Mine Workers' Union of Zimbabwe, Chamber of Mines, TNC mining subsidiaries, and private tributors in the North Dyke. In the course of 1985, there was a series of meetings of this committee during which thorough-going bargaining was conducted, including site visits where necessary.[29]

The finally agreed solution to the problem was that:

- The mining companies be allowed to retrench their excess labour and thus reduce their labour force to a level they could afford to pay the minimum wage.
- The retrenched workers, together with contract labourers, would be organised into mining cooperatives by the ZMDC. These cooperatives would then work TNC mining claims and produce the chrome ore on contract. The "wisdom" of this decision lay in the fact that cooperators were self-employed individuals who could not be affected by the Industrial Relations Act and its regulations.
- The problem of "the aged and the infirm" workers was to be tackled by the Ministry of Labour's Social Welfare Department.

Indeed, many workers were retrenched, and, together with contractors, organised into mining cooperatives by the ZMDC. Apart from working virgin TNC claims, quite a number of cooperatives took over certain sections of already existing company mines. The ultimate result was that twenty-two (22) cooperatives in the North Dyke (Mutorashanga) and two (2) in the Lalapanzi area (i.e. more than 85% of the total chrome mining cooperatives) were formed in this way. Only four (4) cooperatives in the Middle Dyke (Ngezi area) evolved differently, although the essence of their operations are not different from the rest. We shall examine the internal operations of mining cooperatives later.

What needs to be emphasized here is that the "cooperative option" enabled the mining companies to reduce their labour force considerably. For example, in the North Dyke,

29 From what the author remembers as former Secretary to this Committee.

ZIMALLOYS let all of their Vanad Mine be taken over by five cooperatives, all of their Sutton Mine by another five cooperatives, all but Four Seam of their Caesar Mine by three cooperatives. This means that 13 of their total 15 tributing cooperatives (901 workers) took over existing (loss-making) mining operations. ZIMALLOYS' own mining operations are therefore only confined to Caesar Four Seam, Great Dyke Mine and a planned experimental section at Mvurwi Peak Mine.[30] ZIMASCO are also confined to 144, 145 and 240 Sections of the Mutorashanga Mine.[31] What this means is that ZIMALLOYS reduced the labour force under its payroll from a "possible" 1 433 workers to 532 ("including everybody") employees, i.e. reducing the workforce to even less than 37,12%. ZIMASCO, on the other hand, managed to reduce its own workforce from a "possible" 1 002 workers to 266 underground labourers, i.e. reducing the labour force to 26,50%. The term "possible" refers to a sum total of both cooperative members and company workers; considering what would have been obtaining had the other option been effected, viz, that of employing all workers of the companies' mining claims on a full-time basis. Apart from the obvious labour-cost savings to mining companies, the reduction of the labour force (in terms of numbers) increases the intensity of exploitation (of the appropriation of surplus-value) of the reduced workforce by "intensifying labour". The intensification of labour implies an increase of constant, as compared to variable, capital, and one way of achieving it is by "compelling a labourer to operate a number of machines".[32] Thus, even if the retained workers might be earning a minimum wage, their exploitation would have been intensified because, by increasing their productivity they would generate more surplus-value for the capitalists and, therefore, increase mining companies' profits.

Recruitment, Supervision and Training

By opting for cooperativization, the mining companies avoided the above tasks and thus made significant cost reductions in these aspects of labour. As we indicated earlier, these functions were conveniently taken over by the ZMDC, a statutory mining corporation.

> The Zimbabwe Mining Development Corporation Act, 1982, Part II Section 20 (d) (The Act) states that the duties of the Zimbabwe Mining Development Corporation (ZMDC) shall be, among others, 'to encourage and undertake the formation of mining co-operatives'. To carry out the stated functions and duties, the ZMDC created a Mining Co-operatives Development Department which, supported by the specialist expertise of the Corporation's other departments, provides a full range of services.[33]

For the purpose of its operations, "the ZMDC defines a co-operative as a business enterprise that operates on a self-help basis for the economic benefit of its (not less than 10) members. The members being in effect owner-employees who pool their resources together to form a co-operative enterprise".[34]

> After a co-operative has followed all the necessary steps leading to its formation and registration with the Registrar of Cooperatives, it is "offered" the following services by the ZMDC:

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30 I. Mashumba, Mine Manager, ZIMALLOYS Mining Division (Mutorashanga): *Interview*, 23/9/88.
31 C. Tapfuma, Mine Captain (Tributors and Cooperatives), ZIMASCO (Mutorashanga): *Interview*, 20/9/88.
32 K. Marx: *Ibid.*, p.233.
33 ZMDC: *The Role of the Zimbabwe Mining Development Corporation in Development and Growth of Mining Cooperatives*, 1984, p.1.
34 ZMDC: *Ibid.*, p.1.

COMPLIANCE WITH STATUTORY REGULATIONS

- Co-operative Societies Act (Chapter 193)
- Mines and Minerals Act (Chapter 165)

TECHNICAL SERVICES

- Mine Evaluation
- Mine Planning
- Plant Constructions and Operations

OTHER SERVICES

- Legal Matters
- Marketing and Distribution
- General Training[35]

In executing its duties in terms of the ZMDC Act, the ZMDC has adopted the role of both a recruiting, supervising and training agency for cooperatives. To ensure "compliance with statutory regulations" and adherence to the terms and conditions of Tribute Agreements and Supply Contracts between mining companies and cooperatives, and to facilitate the provision of its other services to cooperatives, the ZMDC employed "resident cooperative advisers", headed by an operations manager stationed in the field. Observation on the ground revealed that these ZMDC "advisers" are frequently referred to (consciously and unconsciously) as "supervisors" by cooperators, largely because of the nature of their work.

While the labour of supervision and management is naturally required and must be performed to co-ordinate and unify the process of production in every combined mode of production:

> This supervision work necessarily arises in all modes of production based on the antithesis between the labourer, as the direct producer and the owner of the means of production ... 'If the nature of the work requires that the workmen should be dispersed over an extended area, the number of overseers, and therefore the cost of the labour which requires this supervision, will be proportionately increased.'[36]

Indeed, cooperatives are "dispersed over an extended area", from Lalapanzi to Mutorashanga, and must be expensive to assist and supervise. Accordingly, the ZMDC deployed three resident advisers to cover the Lalapanzi and Ngezi areas in the south, and eight advisers, together with a clerk and a truck driver, in the North Dyke.

Thus,

> The capitalist mode of production has brought matters to a point where the work of supervision, entirely divorced from the ownership of capital, is always readily obtainable. It has, therefore, come to be useless for the capitalist to perform it himself. An orchestra conductor need not own the instruments of his orchestra nor is it within the scope of his duties as conductor to have anything to do with the "wages" of other musicians.[37]

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35 ZMDC: *Ibid.*, p.2
36 K. Marx: *Ibid.*, p.384.
37 K. Marx: *Ibid.*, p.386.

Whilst the first two sentences of the above quotation actually apply to our case, the last sentence needs to be qualified in relation to the role of the ZMDC. The ZMDC as the "orchestra conductor" does "not own the instruments of (the) orchestra", but the scope of its duties indeed has something to do with the "wages" of the cooperators. This is done at two levels, firstly with regard to ZMDC's remuneration and, secondly, by ZMDC's bargaining for cooperators' earnings. It is the first level that will be examined in detail at this stage.

It is usual practice under capitalism that the recruiter of labour together with the supervisor/manager/managing director should be paid by the ultimate employer of labour and not by the employed labourer. In the past, the recruitment of foreign contract labour was institutionalized by "the setting up and operation of a contract labour bureau in order to recruit, transport, finance and 'distribute' labour to employers who had previously paid the purchase price."[38] This was done initially by the Rhodesian Native Labour Bureau (RNLB) which was set up in 1903. The bureau was changed to the Rhodesian Native Labour Supply Commission (RNLSC) in 1946 and had all the exclusive foreign recruiting rights vested in it. The price of contract labour was the "capitation fee" as set by the RNLSC and payable to it by the employers of labour. In 1948 the fee for workers on 18 months contract was £6 5s 0d per worker "delivered to the employer".

This amounted to 6,94 shillings monthly if averaged over the contract period and represented 27,7% of the monthly cash wage set by the RNLSC . . . "Contract labour was a very profitable business. The fee was fixed on the basis that it would cover the full cost of recruitment, transport, repatriation, etc, of the worker. Actual costs depended greatly on the volume of labour recruitment since average fixed costs would be lower with a higher volume of recruits."[39] The main employers of foreign contract labour during this period were the agricultural plantations and mines. Incidentally, the vast majority of mining cooperators are of foreign origin and might have been recruited in this way!

However, it would appear the trend was reversed with regard to the operations of ZMDC. Besides merely bargaining for cooperative ore prices, the ZMDC does not charge the mining companies for its services which obviously and ultimately benefit these companies. While the question of ZMDC remuneration is incorporated in the bargaining process, it is not an issue of obligation for the mining houses but for cooperatives. We will examine this aspect in more detail when we deal with the pricing system. What needs to be noted here is that, instead of being paid for services rendered as the recruiter, supervisor and trainer of labour by the owners of the means of production (because, as we shall see later, the fundamental issue of ownership has remained completely unchanged), the ZMDC seeks compensation from the labourers as a "consultant".[40]

The ZMDC, therefore, extracts a "ZMDC levy" or "ZMDC fee" from cooperatives, in addition to charging for its other services to cooperatives, e.g. transportation of inputs. The ZMDC levy is based on the policy that "the ZMDC as a parastatal must make profit and (that) the cooperatives, being non-charitable organizations, must be profit-making independent entities which must always pay for services rendered".[41] However, the initial

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38 D. G. Clarke: *Contract Workers and Underdevelopment in Rhodesia*, p.8.
39 D. G. Clarke: *Ibid.*, p.43.
40 Because ZMDC considers cooperators to be illiterate, ignorant and incapable of managing their own affairs and bargaining successfully with mining companies.
41 E. Kahari, Executive Director (Cooperatives), ZMDC: *Interview*, 14/10/88.

objective is for ZMDC to recover its "out of pocket expenses". Accordingly, ZMDC is paid a fee ranging from $2/tonne of chrome ore sold to $3/t and $28/hr for the transportation of inputs (mostly equipment and timber) to mine sites by cooperatives. There are differences in the levy charged to different cooperatives because this levy is "based on the ability to pay and is designed in such a way as to avoid its negative impact on cooperative profits".

Consequently, "$2/t (sold) is paid by ZIMALLOYS 'surface' cooperatives, $2,50 by ZIMASCO 'surface' cooperatives, and $3 by ZIMALLOYS 'underground' cooperatives" in the North Dyke and $3 is paid by all (except one paying $2,50) cooperatives in the South Dyke.[42] This means that 18 cooperatives (64%) pay $3/t, eight (29%), pay $2,50/t and two (7%) pay $2/t. An earlier study on the 28 cooperatives revealed that these cooperatives employ over 2 000 members and their monthly average productivity was 3t/worker.[43] Considering that those cooperatives paying $3/t are the majority and have a much higher productivity per worker than those paying less, one could use these earlier findings and estimate the monthly revenue accruing to ZMDC as $(2 000 x 3 x 3) = $18 000. This would mean that each of the 11 ZMDC advisers generates an average of $1 636 per month for the ZMDC.

The levy is charged in specific amounts per tonne sold rather than in terms of a specific percentage of the gross value (as does a royalty charged by one of the companies) so as to make it dependent only on production and sales rather than on value/price. This will, therefore, keep the levy cost item constant if the price of a given tonnage of ore rises. Whereas "contract labour was a highly profitable business" to the RNLSC, "contract cooperatives" are, however, something else to the ZMDC. The aim of the ZMDC is to at least break even, but "so far, while there can be a profit in terms of salaries of ZMDC personnel attached to cooperatives, there are "other expenses" which haven't been met from the total revenue generated through the levy and other charges, and ZMDC has met the shortfall". In meeting the shortfall, therefore, ZMDC is "subsidising cooperatives and, indirectly, mining companies". This issue was raised in ZMDC negotiations with mining houses but the companies were not forthcoming because of their concern with profit and their feeling that "they didn't ask the ZMDC to form cooperatives".[44]

Mining is very demanding and, therefore, expensive in terms of supervision and training because it is not only necessary to increase production and meet the set targets but also to ensure safety and proper mining methods/standards according to the Mines and Minerals Act as implemented by the Mines Inspectorate. What is clear from the above discussion is that the mining companies have yet made other significant cost reductions in terms of recruiting, supervising and training labour. The owners of the means of production have, therefore, managed to let labour mobilize, supervise and train itself, since cooperatives pay (albeit inadequately) the ZMDC for these services.

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42 A. Muchenje, Acting Operations Manager (North Dyke), ZMDC: *Interview*, 22/88.
43 H. Chiwawa: *Ibid*., pp.6, 9.
44 E. Kahari: *Interview*, 14/10/88.

Remuneration

MAJOR TERMS AND CONDITIONS OF TRIBUTE AGREEMENTS/SUPPLY CONTRACTS

This aspect is provided for largely in terms of Parts XII, XIV and XV of the Mines and Minerals Act (Chapter 165) and some of the specific features as regards cooperatives ("tributors") and mining companies ("grantors") are as follows:[45]

TRIBUTING

The tributor shall have the right to work the said mining location, to develop and extract chrome ore by conventional mining methods and/or by surface trenching and hand-picking. The tributor shall assume all responsibility in connection with the mining claims as if he were the owner thereof. In consideration of the rights conferred by the grantor to the tributor, the tributor shall pay to the grantor a royalty amounting to 50 cents per tonne of ore produced (ZIMASCO) or to 5% of the total at site saleable value of the chromite ores disposed by the cooperative from the said mining location (ZIMALLOYS). The grantor or his duly appointed representative shall be entitled at all reasonable times to inspect mines within the mining location to satisfy himself that the terms of this agreement are being observed.

PRODUCTION

In exchange for the said tribute rights, the company has the exclusive right of purchase of any production by the cooperative from the mining location. No production of chrome ore or other minerals from the mining location, whether or not such production is acceptable to the company, may be sold or disposed of in any other way to any other party. The tributor undertakes to report to the grantor all discoveries of mineral deposits or previously unknown chrome ore bodies made by him in working the said mining location and generally give the grantor all information which he may obtain and which may be of use or service to the grantor. No treatment of the mined ore, other than sorting, screening or cobbling shall be undertaken by the tributor except with the prior written consent of the grantor. Where the chrome ore produced by the tributor is to be removed by the grantor, such production shall be stacked on selected stacking sites approved in advance by the grantor. The physical shape of the stack shall be such that the area of the base of the stack shall be minimal to achieve maximum height and of regular shape to facilitate measurement. The stack when offered for sale shall be free of props, stakes or any material designed to act as a container. The grantor reserves the right to reject any production offered for sale by the tributor which does not comply with the above specifications of shape and locality.

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45 Summary of copies of Tribute Agreements in the North Dyke.

ORE SPECIFICATIONS

ZIMASCO – Ore supplied by the tributor for sale to the grantor must be clearly picked ore, free from dust, dirt, sweepings, waste rock, and other foreign material and shall be of the following specifications and not susceptible to decrepitation:

Cr_2O_3	grade %	–	minimum 42	
Cr:Fe	ratio	–	minimum 2,5:1	
Size of ore	(inches)	–	minimum 1/2"	maximum 5"

The grantor reserves the right to reject any production offered for sale by the tributor which does not comply with the above specifications of grade and size. The ZIMALLOYS chrome ore to be supplied by the cooperative to the company shall be hard lumpy chromite ore in bulk and:

- Shall have a Chromic Oxide (Cr_2O_3) content of a minimum of 43% (Cr_2O_3) and a target base grade of 45% (Cr_2O_3) in respect of deliveries.
- Shall have a Chrome/Iron (Cr:Fe) ratio of not less than 2,8:1 and a target base average ratio of 3,0:1 in respect of deliveries.
- Shall be of the size plus 19 mm, minus 150 mm at the point of delivery with a tolerance of no more than six percent (6%) of the mass delivered being outside this size specification.

The company may at its discretion agree to the delivery of fine chromite ore material within the other specifications of quality. Acceptance of this material would be subject to the demand prevailing from time to time and to the availability of concentration facilities.

SAMPLING, GRADING, WEIGHT DETERMINATION

Chromite ore deliveries will be sampled by the company in such a manner as is recognized as being normal within the industry. The company shall conduct its analysis of the samples so drawn (either individually or collectively) as soon as is reasonably practicable but not later than seven days after arrival of the material at its premises in order to establish the average chromic oxide (Cr_2O_3) content of the ore and its chrome:iron ratio and shall forthwith transmit the results to the cooperative. The specifications of the samples of the ore as determined by the company will be final and binding on both parties. The weight of the chromite ore delivered to the company shall be determined (in the North Dyke and for ZIMALLOYS) upon the company's weighbridge at the Sutton processing plant (and at Kildonan Siding for ZIMASCO) upon actual receipt of the chromite ore and details of the weights shall be transmitted to the cooperative.

PAYMENT/PURCHASE PRICE

ZIMASCO – Payment will be based on the tonnages recorded on the grantor's weighbridge, reconciled with the weights of the railed ore, supplied by the ZIMASCO Smelter Division in Kwekwe.

ZIMALLOYS – The amount to be paid by the company to the cooperative for the chromite ore delivered to the company shall be based on the chromic oxide (Cr_2O_3) content of such chromite ore. This will be at an in-situ target seam face grade as measured and assayed once a month by the company and with a pro-rata adjustment up or down for ore

of a chromic oxide content of above or below the monthly target face grade. Rates of payment for the chromite ore shall be established by negotiation and reviewed on each annual anniversary day of the signing of the agreement or when necessitated by statutory wage increases.

EQUIPMENT

Where the tributor requests to hire, loan or purchase equipment, material, tools or explosives for the purpose of mining ore on the said claims, he should submit such request in writing to the grantor who will propose such conditions and terms for such purchase, loan or hire as he deems fit and proper. The cooperative shall at its own expense insure all company machinery against loss or damage by theft or otherwise and it shall be and remain responsible for the value of the same until it has delivered such machinery to the company and in the case of loss or damage, the cooperative shall make good to the company the value of the machinery lost or the amount of the damage.

OTHER LEGAL REQUIREMENTS

The tributor will be responsible for the surface protection on claims covered under the tribute agreement. This includes the filling in of any surface trenches, excavations, workings, etc to the original ground level that existed prior to the commencement of mining operations. The fill is to be compacted to ensure that no danger exists for persons or livestock travelling over this fill. All surface excavations, adits, shafts, raises holing to the surface are to be protected by a substantial fence, stone wall or similar barricade to ensure no unintentional access to these areas is possible by humans or livestock. No trees, shrubs or other vegetation shall be interfered with, except for the direct purpose of conducting mining operations, without the written agreement of the land owner and the company.

Section 269 of the Mines and Minerals Act (Chapter 165) reads, inter alia:

> If upon examination of any tribute agreement which has been submitted to it by a mining commissioner the (Mining Affairs) Board is satisfied:
>
> - that the method of fixing the tribute royalty payable to the grantor and the rate of such a royalty are satisfactory and are not likely to retard the progress or expansion of the mine or bring about the early cessation of mining operations; and
> - that the interests of both the grantor and the tributor are adequately safeguarded thereunder; and
> - that the period of such agreement is clearly defined and if termination of the agreement by notice is provided for, that the interests of the parties to the agreement are adequately protected; and
> - that the development work required by the agreement is reasonable in the circumstances and is not unduly burdensome or likely to cause the premature cessation of mining operations on the mine; and
> - that in all respects the agreement is satisfactory and likely to result in the mine being mined to the best advantage; the Board may approve the agreement and shall endorse such approval thereon . . .

To the extent that the tribute agreements are already in force, one can conclude that the Mining Affairs Board, chaired by the Permanent Secretary for Mines, was satisfied that the agreements are in all respects satisfactory. However, apart from the other possible

shortcomings, we need to point out one relating to the royalty, in reference to Section 231 subsections (4) and (5) of the Mines and Minerals Act (Chapter 165):

> 4. There shall be a full rebate of royalty in respect of all minerals or mineral-bearing products used wholly within (Zimbabwe).
>
> 5. There shall be a rebate of royalty in respect of any mineral or mineral-bearing product which is:
>
> a) disposed of to or received for treatment by an approved beneficiation plant; and
>
> b) specified in relation to that approved beneficiation plant;
>
> at the rate specified by the Minister in terms of Section 234 in respect of that approved beneficiation plant.

Section 234 (1) reads:

> The Minister may, upon the application by the owner thereof, by notice in the Gazette, declare any bank assay department, factory, refinery, smelter or treatment plant which is situated in (Zimbabwe) to be an approved beneficiation plant in relation to a mineral or mineral-bearing product to be specified in the notice.

Because cooperatives' output is wholly used in Zimbabwe, with no ore being exported, they must be entitled to a full rebate of royalty in terms of 231 (4) of the Act. Besides, even if one were to assume the application of 231(5) and 234(1), one faces problems with regard to "the rate specified by the Minister". There are different rates of royalty, 50c/t, $3^1/_3$% of gross value and 5% of gross value, being applied for the same product and yet, in terms of 232(5) of the Act:

> In fixing the rate of royalty in terms of this section the Minister may fix different rates of royalty in respect of different minerals or mineral-bearing products.

We will proceed to analyse how the Tribute Agreement/ Supply Contract serves to lower both the labour and (later) "capital" costs.

PAYMENT ON TONNAGE BASIS

The payment of labourers on output, rather than on hourly, basis which mining companies managed to do by dealing with cooperatives, has the effect of under-valuing labour and raising the intensity of exploitation. The extent to which this occurs depends on the stripping ratio at a particular mine working. The stripping ratio is the amount of waste material mined to send one tonne of ore to the smelter. It was explained earlier that the geology of the Middle and North Dyke necessitates much higher mining costs as the chrome seams are much thinner than in the South. Consequently, the stripping ratios are much higher in the Middle and North Dyke than in the south. "Intelligent guesses" put the Middle and North Dyke stripping ratio at a range of anything from five to over 10! What this means, for example, is that a worker will take five days to produce one tonne of ore,with all the labour prior to the production of one tonne not being paid for. Where the stripping ratio might exceed 20 (e.g. when sinking an adit or winze) it means there is a lot of development work to be done, and there are cases of co-operatives going for a month or two without producing anything (though working very hard) and thus incurring debts.

Ten might indeed be an "intelligent guess" for the cooperative stripping ratio. If we take our earlier example of an average productivity per worker of three tonnes/month

we see that over a period of 26 working days, a worker produces three tonnes, implying a production rate of one tonne in 8.6 days. There are other factors which affect productivity but the stripping ratio is a major one.

The payment on output basis, therefore, is equivalent to the

> prolongation of the working day . . . which increases the mass of appropriated surplus-labour without essentially altering the proportion of the employed labour-power to the constant capital set in motion by it, and which rather tends to reduce this capital relatively. (There is also) the widespread introduction of female (mostly on casual/part-time basis) . . . labour insofar as the whole family must now perform more surplus-labour for capital than before . . .[46]
>
> Suppose a capital of 100 produces a surplus-value of 20 employing 20 labourers working a 10-hour day for a total weekly wage of 20. Then we have : 80c + 20v + 20s; s = 100%, p' = 20%. Now the working day is lengthened to 15 hours without raising the wages. The total value produced by the 20 labourers will thereby increase from 40 to 60 (10:15 = 40:60). Since v, the wages paid to the labourers, remains the same, the surplus-value rises from 20 to 40 and we have: 80c + 20v + 40s; s = 200%, p' = 40%".[47]

Extending the working day, therefore, increases the rate of surplus-value and the rate of profit. "If the labourers must work 18 instead of 12 hours, this makes a difference of three days more per week, so that one week is stretched into one and a half, and two years into three."[48] In cooperative chrome mining, as explained earlier, the extent to which the working day will be prolonged largely depends on the stripping ratio. Imagine your working day lengthened even five times.

The mining companies, therefore, by opting for cooperatives, managed to reduce their labour costs in terms of wages by the extent of the stripping ratio.

THE GRADING SYSTEM

- The Rationale for Quality Specification:
  As explained earlier, there are two ferrochrome smelters in the country owned by the two transnational corporations, Anglo American Corporation Limited and Union Carbide Corporation Limited. Their subsidiaries, ZIMALLOYS and ZIMASCO respectively, have smelters in Gweru and Kwekwe respectively. It is these two smelting plants that consume all the chrome ore produced in the country and we will proceed to briefly examine their operations and requirements.

Both ZIMALLOYS and ZIMASCO source their raw materials from within the country as well as from abroad. ZIMALLOYS obtains its raw materials from the following sources:[49]

- Chrome ore from mines in Mutorashanga, Lalapanzi, Inyala (Mberengwa area), Ngezi.
- Coke from the Wankie Colliery Company (an Anglo American subsidiary).
- Quartz from Broadside Mine between Gweru and Kwekwe.

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46 K. Marx: *Ibid.*, p.233.
47 K. Marx: *Ibid.*, p.78.
48 K. Marx: *Ibid.*, p.78.
49 D. Denton, Plant Metallurgist, ZIMALLOYS (Smelter Division, Gweru): *Interview*, 2/9/88.

- Partially hydrolysed PPC Lime (CaO (H_2)) from Lime Acres near Kimberley in South Africa. The lime, which is used as a catalyst and for the production of calcium carbide, is imported at about $100/tonne and is consumed at about 100 tonnes/day.
- Electrode paste from Soderburg in South Africa at about $2m/year. The electrode paste, which is really carbon paste, solidifies with increases in temperature and is used to make electrodes used in electric arc furnaces.
- Ferromanganese ores from South Africa used in the production of ferromanganese used by ZISCO to make steel.
- Molasses from Hippo Valley (another Anglo subsidiary) used as a binder in chrome ore briquett-making.

ZIMASCO's plant utilises chrome ore which is supplied from a number of mines in Zimbabwe, notably Shurugwi, Lalapanzi and Mutorashanga with minor amounts from Ngezi and Darwendale. The plant's coal and coke are supplied from Hwange or South Africa, depending on chemical analysis. Sulphur is a deleterious element as far as alloy production is concerned and Hwange reductants are high in sulphur. Consequently, very little of Hwange coal and coke is used. There are two types of imported coal and coke, named after their sources, viz Delmas and Eikboom coal, Vryheid and Newcastle coke. Quartz is obtained from a local quarry (whose claims are owned by Union Carbide) near Kwekwe, slag from ZIMALLOYS, and dump sand for lining chill moulds from various mine dumps. Coal and coke are used as reductants while quartz and slag are used as fluxes.

The main product is ferrochrome from chrome ore which contains chromic oxide (Cr_2O_3), iron oxide (FeO) and various other oxides such as magnesia (MgO), alumina (Al_2O_3) and silica (SiO_2). Ferrochrome is a metallic alloy consisting largely of metallic chrome and metallic iron. In addition, there are small quantities of carbon, sulphur and silicon. The proportions of these minor elements decide the various alloy grades. The major use of ferrochrome is in the manufacture of stainless steel and the alloy is sold throughout the world wherever stainless steel is manufactured.

Basically, in order to release the chrome and iron it is necessary to heat the ore up to a temperature of approximately 1 700 degrees C and to add carbon as a reducing agent. The carbon combines with oxygen to form carbon monoxide and dioxide which go up the stack leaving behind metallic chrome (Cr) and metallic iron (Fe) which in combination form ferrochrome.

The remaining oxides of magnesia, alumina and silica form a slag (waste product) which is thrown away. The whole operation takes place largely in submerged arc furnaces which attain the necessary high temperature by passing electric current through the mixture of ores, carbon and fluxes.

The ZIMASCO plant has six furnaces with a combined electrical consumption of 105 Mgw, which is equivalent to 76 000 000 KW hours/month. The ZIMALLOYS smelter has six furnaces plus one on rebuild and scheduled to resume operation in January 1989. This plant has one L - or open arc - furnace which produces low-carbon ferrochrome (LCFC). In the open arc furnace, gas passage is not needed and silicon (from ferrosilicon chrome or ferrosilicon) rather than carbon, is used as a reductant. The silicon reacts with oxygen to form a silicate which is collected by the lime. Each furnace consists of a steel shell which is lined with carbon blocks on the base (hearth) and refractory bricks (also imported) around the circumference. The lining is to protect the steel shell from extreme heat. The furnace basically is in the shape of a cooking pot and performs the same function as a

cooking pot. Three electrodes project down into the shell and pass current through the charge. A taphole at the bottom of the furnace is opened regularly to allow molten metal and slag to flow out into moulds where the metal is allowed to cool before finally breaking. In this process the slag, which is light, rises to the surface of the mould where it is skimmed off for disposal. Excess slag overflows from the mould into a slag pot and is subsequently poured into high-pressure jets of water and granulated to provide an easily disposable material of the consistency of river sand.

Raw materials are blended in a pre-determined ratio with a standard blend at ZIMASCO consisting of 33t of ore and 6-8t of coal/coke. An average ore analysis of all ores used in the process at ZIMASCO is Cr_2O_3 42,00%, FeO 14,00%, and SiO_2 29,50%, MgO 16,50%, CaO 1,30% and $A1_2O_3$ 11,50%. Fluxes basically control the viscosity of the molten material thus allowing it to run easily out of the taphole. The main flux used in most smelting is silica in the form of quartz and at ZIMASCO felsite, which is a silicate of alumina containing approximately 20% Al_2O_3, is occasionally used. It requires approximately 3 900 kilowatt hours of power, 2,5 tonnes of chrome ore and half a tonne of fixed carbon in coal or coke to produce one tonne of ferrochrome. The smelters' operations are continuous over 24 hours per day and 365 days in the year.

In addition to the chemical composition, the physical form of the chrome ore is also important. Chemically, it is necessary to have ores with a low slag constituent (silica, magnesia, alumina, etc) content because, e.g. the more the silica, the more the slag and the more the energy used per tonne of alloy. Physically, the spacing between solid particles is very important as this affects the chemical reactions and energy consumption. The larger the space the faster the reactions as carbon monoxide and dioxide gases are allowed to escape, the less the impurities in the final product and the less the energy used. The opposite is true if this space is reduced. Consequently, lumpy ore is required as feed material into the smelter furnaces. Ore fines have the effect of reducing the space for gas passage and so they are:

- initially discouraged
- briquetted (only at ZIMALLOYS' briquetting plant)
- used in very low/limited quantities and/or
- only used in the production of LCFC.

Briquettes can only go up to 50% in combination with a lumpy charge as they tend to crumble into fines in the furnace. Fines are also used in limited amounts in LCFC production because, unlike concentrates which are more pure, they are low grade and contain a lot of impurities.

ZIMASCO produce only high-carbon ferrochrome (HCFC). It is difficult to predict the type of grade to be produced as grades depend on chrome, sulphur, silicon and carbon content. Different grades are stockpiled as production continues. All grades are in demand. There are plans at ZIMASCO to commission a smaller three-magawatt induction furnace from the USA which will remelt the HCFC fines (< 12,5 mm) which are currently being recovered from slag through a jigging operation and stockpiled as they are unsaleable. The furnace cost is estimated at $5,5m and is expected to increase the plant's foreign exchange earnings by as much as $23m/year.[50]

50 T. Ravasingadi, Plant Metallurgist, ZIMASCO (Smelter Division, Kwekwe): *Interview* , 6/9/88.
See also "New $5,5m Furnace Could Earn Extra $23m in Forex", in *The Financial Gazette*, November 4, 1988, p.3.

ZIMALLOYS produce a number of products which include LCFC, ferrosilicon, ferromanganese, ferrosiliconchrome, used lime sold as agricultural lime and calcium carbide (CaC_2). ZIMALLOYS' supply of calcium carbide meets 70% of the country's requirements with the balance met from South African imports. Calcium carbide reacts with water to give acetylene C_2H_2 gas which is highly inflammable. Acetylene is largely used in welding and is supplied by OXYCO in Zimbabwe. The gas is also used for illumination by cooperatives undertaking underground mining operations without electricity in the North Dyke and, as we shall see later, calcium carbide is one of the major consumables for these cooperatives.

GRADE DETERMINATION

It was observed earlier that, according to the Tribute Agreement/Supply Contract, there has to be ore of specified quality to be produced by cooperatives and other tributors in order to meet the above smelter requirements. The mining companies, therefore, ensure that the smelters are adequately supplied with ore of the desired quality and physical dimensions. Accordingly, grade determination is done by the mining companies as consumers of the cooperatives' output.

At ZIMASCO, sampling is done as the ore is delivered to the weighbridge. The sampler wears dark goggles so that he will not see the detailed features of what he picks from the lorry. One or two stones are picked from each corner of the lorry as well as from the centre as the lorry comes on to the weighbridge. After the lorry has tipped the ore, a couple of stones are picked at random and these, together with those taken on arrival, are then considered to constitute a representative sample for a particular lorry.

The same sampling procedure is followed for each lorry. The samples so determined are taken to the ZIMASCO laboratory where an assay report on each lorry sample will be issued. To arrive at a particular grade for a given producer cooperative, a weighted average of the grades is taken. The weighting is based on the tonnage and not on the grade. For a given period, usually a month, the producer, operation site, date, serial number, lorry number, gross weight, lorry tare, load (tonnes), sample number, grade % Cr_2O_3,tonnes x grade, and weighted average grade are recorded on the SI form. In addition, and as per contract, cooperatives are allowed 40 free in-situ sample assays per month and anything in excess is charged an assay fee of $3 per sample. Ore fines are not taken from the cooperative mine site. It is possible to cross-check on the assay results as samples are stored in the laboratory in composite sample form so that one can actually go back and check on the weighted average grade. Samples can also be tested elsewhere with only 2% deviation being allowed. Cooperatives are said to have the facilities to cross-check.[51]

For ZIMALLOYS, the grade is controlled from the pick-up point and anything below the minimum requirements is not taken. Thus, grading is done at the workplace and not at the weighbridge, particularly in the North Dyke. Samples are taken from the stockpile at the mine and then assayed at the Sutton laboratory. Stones are picked from the top corners of the stack and from the middle. The stack is then destroyed and the ore picked at random.

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51 Tapfuma: *Interview*, 20/9/88.

The sampling procedure keeps changing because, from past experience, there is a tendency for cooperatives to put high-grade ore at "strategic" points. All ore fines of acceptable grade are taken.[52]

Cooperatives have developed their own ways of determining the weight of their product. What is interesting to note are the differences in their "crude" methods of measurement. For underground operations, one full cocopan equals one tonne of ore. For those without cocopans, stacks of well-defined dimensions per cooperative are believed to weigh one tonne. These stacks include some of the following dimensions: 1m x 1m x .3m, 1m x 1m x .4m, 1m x 1m x .55m, 1m x 1m x .65m, 4ft x 4ft x 1ft. It is not known who came up with these measurements but the general opinion is that these emanated from past experience when the cooperators were madobadoba contract workers. At the Kildonan weighbridge, the scale prints automatically and produces three copies with one copy being attached to a copy of the haulage receipt book. At Sutton, the scale is not automatic and so the weighbridge clerk records the weight. The cooperative weights, measured the "crude" way in cocopans and on stacks, have always been different from the weighbridge figures, and there have been more cases of underweight than overweight. All the 14 cooperatives which responded to the question mentioned more frequent cases of underweight than overweight. The main reasons given for underweight were the gaps left between lumps on stacks and the removal, by the buyer, of a percentage moisture from the measured tonnage of moist underground ore. Whilst ZIMASCO allows cooperatives to observe the sampling and weighing procedures, it has not been possible for cooperative representatives to always observe and monitor these operations as there can be too many lorries and the cooperative representatives would be engaged in other business. ZIMALLOYS decided not to permit cooperative representation and observation since there have been cases of disruptions and misunderstandings in the past. While cooperatives have facilities (which most of them are not even aware of) to cross-check on the assay results, cross-checking has long been discontinued by the ZMDC. Cross-checking on the grade was once done through the Department of Metallurgy of the Ministry of Mines. The results were not good enough as it turned out that actually the mining companies had better assay results![53]

Given that there has been little or no cooperative involvement and monitoring in sampling and weighing as well as cross-checking on weight (cooperatives do not have scales) and grade, all the transactions, therefore, have been, and continue to be, based on "good faith" although cooperators have their own doubts and suspicions. For example, there have been cases of a stack being rejected as low grade ore, only to be found acceptable (by the same samplers who would have forgotten that they once sampled the stack) two or three months later![54]

THE PRICING SYSTEM

We observed earlier that as per contract, price determination is not done by the free market forces of demand and supply, but through negotiation. This bargaining, however, is not (so far) between the buyer and the direct producer, but between the buyer TNCs and the ZMDC, with the ZMDC assumed to fully represent the interests of the producer cooperatives. The bargaining is done on an annual basis or following changes in the

52 I. Mashumba: *Interview*, 23/9/88.
53 E. Kahari: *Interview*, 14/10/88.
54 As at Caesar Mine.

statutory wage regulations. This is different from the Minerals Marketing Corporation of Zimbabwe (MMCZ) price negotiations with foreign ferrochrome buyers which are usually held on a quarterly basis. There is no MMCZ involvement in cooperative marketing arrangements because cooperatives are ore producers selling to local smelters while MMCZ's main concern is exports.[55]

Below is a rather outdated example of how the final negotiated price of $69,70 per tonne of ore was calculated for a North Dyke producer:

	Item	Amount ($)
i)	Development	2,50
ii)	Plant Hire	3,00
iii)	Service Workers (Chairman, Secretary, Gang Leaders)	5,50
iv)	Payment to members	23,00
v)	Explosives and fuel	9,20
vi)	Stores and stationery	5,20
vii)	Timber	3,00
viii)	Equipment repairs	2,40
ix)	Depreciation	3,50
x)	Insurance/Workmen's Compensation	1,00
xi)	Travelling allowance	0,20
xii)	Contingency	2,20
xiii)	ZMDC fees	3,00
	TOTAL	69,70 [56]

Different prices are paid for the same grade of ore depending on the buyer, mining methods employed, and the area of operation. ZIMASCO pay all their tributors (cooperatives and the four private "small workers") $2 per chrome unit per grade or percentage, e.g. $90/t of 45% Cr_2O_3 in the North Dyke. Also in the North Dyke, ZIMLLOYS pay as per mining method employed as follows:

- $1,83/chrome unit/%age for "surface" operations which include handpicking, trenching and adit mining.
- $2,64/chrome unit/%age for "underground" mining which largely involves winze-sinking on the part of cooperatives.

In the South – Ngezi and Lalapanzi areas – the same price of $1,87/unit/%age is paid by both buyers. These prices, therefore, are initially based only on the buyer, tonnage, grade, mining method and area of operation but not on the rate of inflation (a lot can happen in a year in terms of rising input costs), price of the final product (ferrochrome) minimum wage and/or a specified mark-up or profit level.

From the 1985 pricing example, when the minimum wage for commerce and industry was $125, it is clear that, while the average output per cooperative worker was about 3t/month,

55 M. Rule, General Manager, MMCZ: *Interview*, 12/10/88.
56 ZMDC Records, Vanad Mine, Mutorashanga.

anyone producing less than 5,4t/month would earn below the minimum wage and, as has been shown by a recent study, this trend of earning below the minimum wage has continued to date.[57] It is also clear from the breakdown that there is no explicit provision for profit, unless, of course, we assume that "contingency" represents a profit element. In that case the mark-up level would be 3,2% – which came to be eroded in later years by the royalty! We can only conclude, from the above, that the negotiated prices are equated, albeit differently and inadequately, to the cost of production. Even using the same logic, we need to question the basis for the present mining method price differentials.

A mine shaft provides means of access for men, materials and minerals to or from a mine. The shaft may be either vertical or inclined and its size and shape vary widely depending upon the condition it is designed for. A winze is any tunnel having an inclination below the horizontal in the direction of working of more than 5^0. An adit, on the other hand, is defined as a level or horizontal tunnel into a mine.[58] Cooperatives mining chrome along the dyke do not have any shafts but winzes, adits and surface trenches. Winzes are considered most expensive because of the need for the use of hoists which consume electrical energy. It is not convincing that winze costs are 44,3% above adit costs as reflected by the prices. Besides, a raise or even a winze can be developed from an adit as was done by some cooperatives, and this should affect adit costs. Further, it is incredible that hand-picking and surface trenching costs are the same as adit mining costs. No adequate explanation could be given for the north/south price differences.

There is, however, a more fundamental problem in equating the price of the final product only to its cost of production. This relates to the appropriation of the surplus-value:

> The thoughtless conception that the cost-price of a commodity constitutes its actual value, and that surplus-value springs from selling the product above its value, so that commodities would be sold at their value if their selling price were equal their cost price, i.e. if it were to equal the price of the consumed means of production plus wages, has been heralded to the world as a newly discovered secret of socialism by Proudhon with his customary quasi-scientific chicanery . . . The various constituent elements of the value of a product may be represented in proportional parts of the product itself. For instance . . . if the value of 20 lbs of yarn is 30 shillings – namely 24 shillings of means of production, 3 shillings of labour-power, and 3 shillings of surplus-value – then this surplus-value may be represented as 1/10 of the product = 2 lbs of yarn. Should these 20 lbs of yarn now be sold at their cost-price, at 27 shillings, then the purchaser receives 2 lbs of yarn for nothing, or the article is sold 1/10 below its value. But the labourer has, as before, performed his surplus-labour, only this time for the purchaser of the yarn instead of the capitalist yarn producer.[59]

The cooperative labourer, in our case, performs his surplus-labour for the purchaser of the ore, who happens to be the capitalist owner of the means of production. Appropriation of the surplus-value in a cooperative is, according to conventional Marxist theory, supposed to be done by the worker so that the issue of exploitation does not exist. But here is a contradictory case where, in addition to performing surplus labour for the purchaser of the product, the worker's wage is exogeneously determined and fixed below the living wage assumed to be the minimum wage. If we take the stripping ratio into account, then the purchaser actually gets more than 4/5-9/10 of the ore for nothing as the product is sold 4/5-9/10 below its value.

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57 H. Chiwawa: *Ibid.*, p.14.
58 A. Muchenje: *Interview*, 22/9/88.
59 K. Marx: *Ibid.*, pp.39-40.

We also need to take note of the following tendencies for the cooperative ore price to fall as well as the double standards in the existing pricing system. The first acknowledged tendency is for the grade (and therefore price) to fall with increases in tonnage. The popular explanation for this inverse relationship is that cooperators add waste rock to the ore to increase the tonnage and thus lowering the grade. Indeed, some of the cooperatives believe that there are some of their members who cheat on the tonnage by adding and cleverly mixing waste rock with chrome ore.

The second tendency for the price to fall is in relation to chrome ore fines. Up to 1967, Zimbabwe was a major exporter of chrome ore and a small exporter of ferrochrome. From 1967-1977 there was an expansion of the local smelting capacity and the exportation of ore was gradually phased out. A clear policy that stopped the exportation of ore was formulated in 1976 based on the position that the country would maximize its foreign exchange earnings if it exported ferrochrome instead of selling ore to foreign ferrochrome makers in competition with itself. The minor exception was chrome ore of refractory quality which was subsequently produced and exported by ZIMASCO as it was uneconomic to consume it locally in that only about 550t/year of alloy would be produced from it.[60] ZIMASCO have a mill in Mutorashanga which produces ore fines, recovered as concentrates through a jigging process. The concentrated fines, known as D2O and D26 and containing about 56% chromite, are sold to overseas buyers. In 1987, 1 533t of D26 and 1 523t of D20, all of unknown value, were exported. This is, however, an insignificant tonnage compared to what is locally consumed.[61]

ZIMASCO require lumpy ore from cooperatives with fines at the mine site not being taken. Only up to 10% allowance for fines due to transportation and handling is tolerated. Any amount in excess of 10% of fines will result in the cooperative being cautioned by the company. The other four private tributors' fines are all taken from the mine site because they are believed to have deep underground operations, made large investments, take up to six months to sink shaft, and tend to hit "friable seams". There are, however, plans to restrict the amount of fines purchased from these "small workers". The four "small worker" private tributors are, with the name of mine in brackets: R. Croucamp (Maryland), P. Griffiths (Impinge), C. Croucamp (Darwendale) and I.L. Mitchell (Mitchell). Lumpy ore, D23 (from cooperatives and other tributors), and ore fines, D25T (from the same sources), of a minimum grade of 42% Cr_2O_3 and a minimum Cr:Fe ratio of 2,5:1 is acceptable.[62] However, an examination of some of the ZIMASCO statements to cooperatives would reveal a difference in position and approach on the part of ZIMASCO. Below are some of the statements from ZIMASCO to two cooperatives.[63]

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60 M. Rule: *Interview*, 12/10/88.
61 C. Tapfuma: *Interview*, 20/9/88.
62 As per tribute agreement.
63 Tavakuenda Mining Cooperative (Darwendale) and Rugare Mining Cooperative (Mutorashanga).

Table I

STATEMENTS FROM ZIMASCO TO TWO COOPERATIVES

COOPERATIVE I

1988

MONTH	ORE	TONNES	%D25t	GRADE ($\%Cr_2O_3$)	PRICE Cr Unit	REVENUE ($)
MARCH	D23	59	–	38,85	$2	4 584,3
	D25T	66	52,8	39	"	5 148
APRIL	D23	173	–	47	"	16 262
	D25T	36	17,2	47	"	3 384
MAY	D23	97	–	46,29	"	8 980,26
	D25T	132	57,6	40	"	10 560
JUNE	D23	140	–	45	"	12 600
	D25T	73	34,3	42	"	6 132
JULY	D23	251	–	45,85	"	23 016
	D25T	0	0	0	"	0
AUGUST	D23	164	–	45	"	14 760
	D25T	78	32,2	45	"	7 020

COOPERATIVE II

APRIL	D23	123	–	45	"	11 070
	D25T	26	17,4	45	"	2 340
MAY	D23	61	–	49,9	"	6 087,8
	D25T	84	57,9	40	"	6 720
JUNE	D23	107	–	49,9	"	10 678,6
	D25T	56	34,4	42	"	4 704
AUGUST	D23	96	–	42	"	8 064
	D25T	46	32,4	42	"	3 864

A number of observations can be made from the above statements. While the two cooperatives are operating in two completely different areas, one in Darwendale and the other in Mutorashanga, the trend in the figures is strikingly similar e.g. in the same month when the amount of D25T exceeds that of D23, its grade is much lower, when D25T is lower than D23 the grades are equated. What is more important to note, however, is that when D25T exceeds D23 or is significantly high, its grade is lower than that of D23. Bearing in mind that ZIMASCO only allows a maximum of 10% fines and a minimum of 42% Cr_2O_3, it is interesting to note that these specifications have been acceptably different. More than 10% of fines were accepted without any "caution" to cooperatives and ore of less than 42% Cr_2O_3 has also been found acceptable. Further, it is indeed puzzling to realise that lumpy ore can crumble into fines of more than half its original size only due to "transportation

and handling". Another important observation is that the classification of cooperative ore into D23 and D25T only began in March 1988. Before then, this breakdown did not exist and only D23 appeared on the statements. March 1988, by the way, was when the statutory minimum wage was raised by 15%, with the prices of cooperative ore being raised by the same percentage, the assumption probably being that cooperatives were already earning a minimum wage. The breakdown of ore into D23 and D25T was a concept not understood by most cooperatives by September 1988. Most cooperative representatives expressed ignorance on what D23 and D25T meant and why this distinction was made on their total delivered tonnage. Even the ZMDC acting operations manager could not shed light on this issue.[64]

In the south – Ngezi and Lalapanzi areas – ore fines (also due to transportation and handling) delivered to ZIMASCO are not paid for. Thus, any ore which crumbles into fines is considered an outright loss to the cooperative. These losses in the form of unpaid tonnes due to fines have caused a lot of concern among cooperators in that, firstly, they have no way of determining the exact figures and, secondly, they have not yet seen where their fines are dumped as being useless. One cooperative, for example, lost $58 975 due to fines in 1986.[65]

The general conclusion to this section of the paper is, from the above findings, that several monopsonistic devices have been designed with the objective of minimising labour costs to mining companies via the cooperative institution. Company payroll workers were grossly reduced; recruitment, supervision and training of labour sidestepped and left to the workers and the State; contracts benefiting companies more than workers signed; the working day extended by the extent of the stripping ratio; output weight and grade unilaterally determined; different prices, ignoring the minimum wage, inflation and profit but equated to the perceived cost of production, set; and double standards in grading and price setting adopted. All these mechanisms have been found convenient to the mining houses and have had the effect of minimizing labour costs, intensifying the exploitation of cooperative labour, and thus maximizing company profits.

The Lowering of "Capital" Costs

We noted earlier that one of the counterbalancing forces against the falling rate of profit is the cheapening of the elements of constant capital, i.e. exercising economy in the employment of constant capital, c. It will be recalled that, since the rate of profit is s/C, or s/(c + v), everything causing a variation in the magnitude of c, and thereby of C, must also bring about a variation in the rate of profit, even if s and v, and their mutual relation, remain unaltered.[66] We will proceed to examine how the objectives of lowering and minimizing the magnitude of c were achieved by mining companies, particularly in relation to their interaction with mining cooperatives. The analysis will be at two levels, firstly at the mining/production stage and, secondly, at the processing/ore consumption level; given that it is the same mining companies that are engaged in these two vertically integrated activities.

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64 A. Muchenje: *Interview*, 22/9/88.
65 Nehanda Mining Cooperative (Ngezi).
66 K. Marx: *Ibid.*, p.106.

Ore Production

PRODUCTION TECHNOLOGY:

The majority of mining cooperatives, indeed, have a "characteristic commonly associated with small-scale mining in developing countries (which) is the preponderance of antiquated, inefficient mining methods and the limited application of modern extraction technology. In fact, artisanal mining characterised by the extensive use of human energy aided only by simple tools"[67] dominates the chrome mining cooperative segment. Cooperative mineral extraction largely involves digging or rock breaking with hand-held tools, with mineral concentration including hand-picking, while loading and transport of ore to the pick-up point is in large part also by hand. There is a widespread use of human energy aided only by simple tools such as pick, shovel, hammer, fork, wheelbarrow, hand drilling machine, etc. Four cooperatives do not have even hand drilling machines as they do not use explosives. Sixteen cooperatives (57%) use machinery driven by human energy because they have no electricity or diesel power in the form of compressors. The majority of cooperatives using electricity and relatively "sophisticated" machinery (most of which they do not own) such as hoists, winches, transformers, electric drilling machines, waterpumps, etc, are those which took over certain sections of company mines.

In terms of the organic composition of capital:

> (the) specific development of the social productivity of labour in each particular sphere of production varies in degree, higher or lower, depending on how large a quantity of means of production are set in motion by a definite quantity of labour hence in a given working day by a definite number of labourers, and consequently on how small a quantity of labour is required for a given quantity of means of production. Such capitals as contain a larger percentage of constant and a smaller percentage of variable capital than the average social capital are, therefore, capitals of higher composition, and conversely, those capitals in which the constant is relatively smaller, and the variable relatively greater than in the average social capital, are called capitals of lower composition. Finally, we call those capitals whose composition coincides with the average, capitals of average composition.[68]

It is true to say that there is capital of lower composition in the mining cooperative segment as reflected by the employed equipment, productivity and cost structure.

We have just observed that mostly "artisanal" mining is undertaken by cooperatives, and:

> (if) the capital in a certain sphere of production is of a lower composition than the average social capital, then this is, in the first place, merely another way of saying that the productivity of the social labour in this particular sphere of production is below the average; for the level of productivity attained is manifested in the relative preponderance of constant over variable capital, or in the continual decrease – for the given capital – of the portion used for wages. On the other hand, if the capital in a certain sphere of production is of a higher composition, then this reflects a development of productiveness that is above average.[69]

An earlier study (which has not been updated) showed that at 3t/worker/month, the average productivity in the chrome mining cooperative sector was far below that in the non-cooperative sector of about 12t/worker/month. The same study also revealed that

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67 R. Noetstaller: *Ibid.*, p.15.
68 K. Marx: *Ibid.*, p.164.
69 K. Marx: *Ibid.*, p.759.

labour-intensive technology was used in cooperative production as the wage bill was, on average, 62% of the total cooperative costs.[70]

That the capital-labour (K/L) ratio (in neoclassical terms) and therefore productivity in the cooperative sector is much lower than in the non-cooperative sector serves to prove the fact that "different spheres of production require different proportions of constant and variable capital in accordance with their specific technical features, and that living labour must play a bigger role in some, and smaller in others".[71] It was explained earlier that mining companies are directly engaged in podiform chrome deposit extraction in the south dyke which enables efficient use of capital-intensive production techniques while cooperatives are confined to stratiform, thin-seam mining in the middle and north dyke which, at present levels of technological development, cannot be efficiently extracted by capital-intensive methods. In fact, the "specific technical features" in chrome mining emanate from the geology of the Great Dyke which dictates the mining methods to be employed.

By resorting to cooperatives, therefore, mining companies managed to avoid "inefficient" capital-intensive methods and thus lowered their costs of constant capital. As we shall see later, though, both the State and mining companies are actively involved in research to "mechanize" thin-seam mining.

FIXED CAPITAL, CONSUMABLES AND OTHER COSTS

The Tribute Agreements between mining companies and cooperatives have provisions for cooperative equipment acquisition and utilization. Cooperatives which took over company mines also inherited the mining equipment. The inheritance of the equipment was, however, not always permanent as the important machinery was given to cooperatives on indefinite hire basis. This is an approach different from the usual (Government) plant hire schemes where equipment is on optional hire purchase from the owner/supplier. Tributor cooperatives hire almost all the equipment "that matters" mostly from ZIMALLOYS. The company equipment hired out to cooperatives from as far back as October 1985 includes hoists, water pumps, winches, alternators, generators, transformers, electric drilling machines, fans, cocopans, etc. Thirteen of the 15 ZIMALLOYS tributor cooperatives which took over company mine sections (five cooperatives at Vanad, three at Caesar and five at Sutton) hire this equipment from the company on an indefinite basis. Information from 12 of these cooperatives with readily available records revealed that on average, total plant hire charges range from $60-$450/month depending on how much of the equipment is hired by a given cooperative. The average monthly plant hire charge per cooperative was, from available information, $290. Itemised monthly plant hire charges indicated that, e.g,.a water pump cost $50, electric drilling machine $20, transformer $20, alternator $50, hoist $30, fan $15, winch $50.[72] In addition to indefinitely hiring the equipment, it is the cooperative's responsibility to maintain, repair and insure that equipment.

Where equipment is necessary but cannot be hired from the mining companies, cooperatives take it upon themselves to purchase it. Many cooperatives would like to "mechanize" their operations but largely due to financial constraints, very few of them have managed to acquire "important" equipment of their own.

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70 H. Chiwawa: *Ibid.*, p.9
71 K. Marx: *Ibid.*, p.759.
72 From ZIMALLOYS tributor cooperatives' records.

Cooperatives on company mines also pay housing and medical rent to ZIMALLOYS amounting to $12/worker/month, constituted as $7 for housing and $5 for medication at ZIMALLOYS mine clinics. The company also gets revenue from its recreational facilities, particularly beerhalls, at its mines. The other cooperatives provide their own housing (which has not changed from the archaic compound system), as well as their own medical and recreational facilities.

Where required, the mining companies supply inputs, mostly consumables such as explosives, timber, carbide, drill bits, oil and fuel, etc at 5% profit termed "handling" charge or fee. Companies also reap a royalty from cooperatives based on the gross value of cooperative output. The royalty, as explained earlier, ranges from 50c/t to 5% ad valorem. The mining companies also managed to eliminate the externalised costs of mining through cooperatives. All land reclamation, e.g. has been left to cooperatives but, large as this cost item is, particularly where surface opencast mining or trenching is concerned, it has not been (from the 1985 example) incorporated into the pricing system.

The above discussion serves to show that the mining companies managed and continue to drastically reduce and even eliminate the (buying, maintenance, repair, insurance, etc) costs of machinery and auxiliary materials (explosives, timber, oil, energy, etc.) in the production process. They also reaped profits from beerhalls, clinics and houses, and from their claim holdings in the form of royalties and avoided external mining costs through the cooperative institution. The result has, therefore, been the desired minimization of "capital" costs and maximization of company profits.

Ferro-Alloy Production

Raw materials are one of the principal components of constant capital and their price fluctuations accordingly influence the rate of profit. "Should the price of raw materials fall by an amount = d, then s/C or s/(c + v) becomes s/(C-d), or s/[(c-d) + v]. Thus the rate of profit rises. Conversely, if the price of raw material rises, then s/C, or s/(c + v), becomes s/(C + d), or s/[(c + d) + v], and the rate of profit falls. Other conditions being equal, the rate of profit, therefore, falls and rises inversely to the price of raw material."[73]

The mining TNCs have been aware of this reality and especially how important the low price of raw materials is for their smelters, "even if fluctuations in the price of raw materials are not accompanied by variations in the sales sphere of the product, and thus quite aside from the relation of demand and supply".[74] The companies' ultimate objective was, therefore, to keep the cost of production or price of chrome ore and other inputs as low as possible in their own supply and in the manner outlined above in thin-seam chrome mining.

> The value of raw and auxiliary materials passes entirely and all at one time into the value of the product in the manufacture of which they are consumed, while the elements of fixed capital transfer their value to the product only gradually in proportion to their wear and tear. It follows that the price of the product is influenced far more by the price of raw materials than that of fixed capital, although the rate of profit is determined by the total value of the capital applied no matter how much of it is consumed in the making of the product.[75]

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73 K. Marx: *Ibid.*, p.106.
74 K. Marx: *Ibid.*, p.106.
75 K. Marx: *Ibid.*, p.108.

At 33t chrome ore and 6-8t coal/coke in a standard smelter charge blend, or at 2,5t ore and 0,5t coal/coke in 1t of alloy, chrome ore represents (in tonnage terms!) 83% of the raw material input and thus becomes by far the most important raw material.

Raw and auxiliary materials, like wages, form part of the circulating capital and must, therefore, be continually replaced in their entirety through the sale of the product, while only the depreciation is to be renewed in the case of machinery. The most important and major auxiliary material in ferro-alloy production is electric energy whose value is represented by power tariffs. A rise in the price of raw and auxiliary materials can curtail or arrest the entire process of production if the price realised by the sale of the commodity should not suffice to replace all the elements of these materials. In the ferrochrome industry, however, it is very difficult, if not impossible, to unilaterally determine the product price on the world market. Because of competition, ferrochrome producers are always price-takers who cannot raise the price to cover costs of production, maintain a given rate of profit, or increase profits. While Zimbabwe is a major ferrochrome producer and second (to South Africa) biggest supplier in terms of international trade, the country faces stiff competition from South Africa, India, the Philippines, Brazil, Albania, Turkey and West Germany.[76]

Given that virtually nothing can be done about the price of the final product, ferrochrome, the TNCs' strategy has been, therefore, to lower, as much as possible, the costs of production in order to avoid losses and maximize profit. The major inputs and, thus, cost items, in ferrochrome production are, as mentioned above, chrome ore and electricity. Electricity tariffs have been increased on several occasions since Independence and, the mining industry, together with Sable Chemicals, and the ferrochrome smelters as major consumers of electrical energy, have been complaining about rising electricity charges. Some mines had to close down, lay off workers or receive soft loans or grants from Government. Electricity tariffs had to increase following the ambitious Hwange Thermal Power Station project and the subsequent "Coal Price Agreements" between Government and the Wankie Colliery Company.

Thus, again, given that the smelters could not control or reduce energy prices, the only way out was to reduce chrome ore costs and maximize profits. We have already outlined how this was done in relation to thin-seam mining and cooperatives. Indeed, profits were maximized as chrome ore was obtained cheaply, particularly from cooperatives, while ferrochrome demand and prices have been high on the world markets.

Conclusion

We can, therefore, conclude that when the mining TNCs were faced with a crisis caused by rising mining costs and, consequently, expensive raw materials, they devised mechanisms aimed at resolving this crisis. A leading instrument was the cooperative, which was made to take over most thin-seam mining operations which had proved very expensive for the mining companies. The cooperatives became convenient institutions for the cheapening of both constant and variable capital (or capital and labour in neoclassical terms) so as to lower ore costs to their smelters. Where labour is concerned, mobilization, supervision and training was left to the workers and a parastatal, contracts largely benefiting the companies

76 M. Rule: *Interview*, 12/10/88.

were signed while remuneration, grading and pricing systems aimed at lowering labour costs were designed and implemented. Fixed capital, raw and auxiliary material costs were also lowered by letting cooperatives use the geologically dictated labour-intensive technology, hiring out equipment to cooperatives, making cooperatives maintain, repair, insure and purchase equipment, renting houses and clinics to cooperatives, letting cooperatives provide their own housing, medical and recreational facilities, and making them pay royalties on company mining claims, as well as purchasing consumables from companies at 5% profit to the companies.

All these had the effect of intensifying the exploitation of cooperative labour and the desired (by the TNCs) effect of lowering chrome ore (the most important raw material) costs to the company smelters and thus maximize profits in the face of rising ferrochrome demand and prices. We will proceed to examine, in more detail, the impact of these external realities on the internal operation of mining cooperatives in the next section of the paper.

Cooperative Internal Operations

Ideology and Labour Organization

COOPERATIVE ORIGINS

We have already outlined and analyzed the fundamental causes of cooperativization in earlier sections of this paper. From that discussion, however, we need to emphasize that a vast majority of cooperatives emerged as takeovers of ailing mines. Two (7%) cooperatives are former syndicates reorganized into cooperatives by the ZMDC, one (4%) was a result of a rehabilitation (of ex-convicts) programme, two (7%) were formed from previously unemployed labour, and the rest (82%) were formed as a re-organization of the contract (madobadoba) labour system, after mine closures and/or by retrenched company workers, especially in the North Dyke. Thus, from the previous elaboration, cooperatives took over "lame or dead ducks" in the middle and north dyke and left "live ducks" in the south to the TNC mining subsidiaries.

In virtually all cases, cooperatives were formed following a Government "directive" through the ZMDC. It then follows that, for the large part, the formation of these cooperatives was externally motivated and planned. This top-down, as opposed to bottom-up, approach to cooperative establishment has had, as we shall see later, a significant impact on genuine democracy, participatory decision-making and cooperative autonomy.

IDEOLOGY AND SPECIALIZATION

The ZMDC mobilizes labour and forms mining cooperatives as required by Government in the ZMDC Act. The Act, however, does not say anything about socialism or capitalism. ZMDC's dealings with cooperatives are usually within Cooperative Principles which are, in essence, socialist. Cooperative Principles are not in the Zimbabwean Cooperative Societies Act as these principles were originally designed by the International Cooperative Alliance and then, later, adopted internationally.[77]

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77 E. Kahari: *Interview*, 14/10/88.

Socialism or no socialism in Acts, Principles, etc what needs to be noted with regard to chrome mining cooperatives is that, so far, the nature of their operations is much more dependent on geological than ideological factors. Consequently, not all chrome mining cooperatives are collectives, and even those that might resemble collectives are not ideologically as such. The nature of the deposit and method of mining determine the modus operandi and income distribution. In surface mining, there is more individualism and virtually no specialization at the production level as each individual looks for his/her own working site, produces individually and combines the output with that of other cooperative members only for marketing purposes. In labour-intensive adit mining, cooperators are organized to produce in groups of two with their product being marketed collectively. It is only in relatively capital-intensive underground mining where there are higher degrees of specialization as mining becomes more complex that both production and marketing are done collectively by the cooperative.

Quite apart from any ideological compulsions, therefore, individualism decreases, and specialization increases, from surface to underground mining. The result has been a unique combination of service/marketing cooperatives and "collective" cooperatives depending on the geology, mining method and level of mechanization, all of which have nothing to do with socialism. The "collective" is in quotes because, in addition to its not being reflective of socialist ideology in this context, it is confined to production, marketing and income aspects without extending to housing, recreation, health, education, etc, as most of these "collectives" are on company mines where they do not own but rent these facilities. It was, therefore, not surprising to observe that cooperative terminology widely used is not reflective of any socialist convictions. For example, such archaic terms as "boss boy", "machine boy", "gang leader", etc, refer to cooperators depending on their duties, and "chef" was coined to refer to someone believed to resemble Government authority (including the author!). The word "comrade" and indeed, all it represents, is not part of the chrome mining cooperative community's vocabulary.

ORGANIZATIONAL STRUCTURE

The cooperatives have an almost uniform organizational structure which, in principle, allows for participatory decision-making, democracy and accountability. The entire cooperative membership is the General Assembly/Meeting, the top body to which all members are accountable. Below the General Meeting is the Management Committee, elected by the members. This committee is made up of the chairman, deputy chairman, secretary, deputy secretary, treasurer, and two or three other members. The Management Committee deals with the day-to-day running of the cooperative and is accountable to the General Assembly.

This is the kind of organizational structure typical of many groupings, e.g. clubs, charitable organizations, (staff) associations, etc, whose management efficiency implications to a directly productive and supposedly profit-making entity such as a mining cooperative are debatable. The general, pernicious view on the cooperative concept, emanating more from the "right" than from the "left" is that:

> Although governments usually support mining cooperatives, opinions on the usefulness of this form of organization are controversial. Possible drawbacks of cooperatives include inefficient

> decision-making due to diluted and vague management responsibility and a potential for dishonest business conduct.[78]

Indeed, similar criticism can be levelled against the existing organizational structure of chrome mining cooperatives. The Management Committee members have no well-defined duties, i.e. job descriptions and their election or appointment are not always based on their capabilities. Even where titles might appear straightforward, it is still not clear what their exact duties are. For example, on a practical level, there does not appear to be any difference between what a secretary does and what a treasurer is supposed to do. Their duties are all accounting operations and there is potential conflict (as in one case) between the two when the secretary's record on finances differs from what the treasurer might have received.

One might hasten to make a recommendation that since the cooperative is not a non-profit-making association, the Management Committee should consist of members specialized in particular areas to avoid duplication and conflict. These areas could include procurement, production or mining engineering, accounts, marketing, repair and maintenance, personnel, etc. The chairman, for example, could be the production manager, secretary the accountant who will also make investment decisions and secure cooperative finance with the post of treasurer being scrapped. Other committee members could be procurement manager; workshops manager; marketing manager who will deal with customer relations and public bureaucracy; personnel manager who will be responsible for manpower issues such as recruitment, training, remuneration and welfare, etc.

Economic Performance

PRODUCTION

- It has already been pointed out that the ultimate determinants of production and productivity are the geological factors which affect and dictate the mining method, technology, scale of operation, etc. We also observed that cooperatives mostly use "artisanal", labour-intensive mining technology which makes their productivity much lower than that of mining companies. Even among cooperatives, however, the geology plays a key role. Six cooperatives in the Middle Dyke have an average output per worker of 8t/month while for those (22) in the North Dyke, where chrome seams are much thinner, average productivity is 3t/month.
- While one of the negative aspects frequently associated with small-scale mining is the inclination of the small-scale miner toward high-grading (mining only the best parts of the deposit), with regard to chrome mining cooperatives, it is not necessarily true that the "reasons for this shortsighted and damaging practice are lack of knowledge of the deposit worked combined with the intention to make a quick profit".[79] High-grading by chrome mining cooperatives is largely due to technical factors and consumer requirements. Labour-intensive mining techniques compel the cooperators to stop operations at a certain point. For example, where surface mining is concerned, particularly in the middle dyke, the artisanal miner is bound to abandon the working at a depth not exceeding 10 metres as continued operations beyond this level and with the same equipment (pick and shovel) would prove very risky.

78 R. Noetstaller, *Ibid.*, p.24.
79 R. Noetstaller: *Ibid.*, p.11.

Similarly, in labour-intensive adit mining, operations have to be stopped after all adit and raise ore reserves have been exhausted, although it would be possible to sink a winze from an adit. Sub-optimal utilization of the mineral potential is, therefore, occurring as many cooperatives lack the financial resources for optimum-scale mine development and thus tie up deposits that could be exploited economically at higher output levels. It should also be mentioned, however, that it is not only lack of equipment (due to lack of finance) but also the absence of the necessary infrastructure, particularly electricity, that causes high-grading. Because they do not have electricity, adit mining cooperatives in the North Dyke have to make do with candles or carbide lamps and hand drilling machines and therefore can, at best, only make raises from adits.

Chrome mining cooperatives are also confined to the production of lumpy ore by the buyer TNCs since, for reasons outlined earlier, ore fines are not encouraged. The result is also high-grading in terms of mineral concentration as only lumpy ore is selected. Mining cooperatives are, therefore, engaged in high-grading at both the mining and mineral concentration levels. This inevitably results in the poor utilization of mineral deposits and the wastage of natural resources.

COST STRUCTURE, REVENUE AND PROFIT

- It has already been discussed that thin-seam miners are higher cost producers than thick-seam operators as larger-scale mines produce at lower unit costs and thus benefit more from economies of scale than smaller mines. Chrome mining cooperatives are higher cost producers faced with a higher stripping ratio than TNC mining subsidiaries extracting podiform deposits in the South Dyke.
- The cooperatives' high cost problem, however, is compounded by the fact that the variable cost element in their total cost is alarmingly greater than the fixed cost component. Field calculations and estimates indicated that, on average, variable cost is 87% of the total cooperative cost per tonne.[80] This is because most charges are pegged on output and thus vary with output changes. We explained that cooperative direct producers are paid per tonne so that wages, even for a fixed number of workers, become variable with changes in output. Some co-operatives also pay their service workers on a tonnage basis and thus making salaries variable as well. The royalties and ZMDC fees are also variable costs as was explained earlier. The main components of cooperative variable costs are, therefore, wages and salaries, consumables (explosives, timber, energy, carbide, candles, etc), transport (in the middle dyke), royalties, ZMDC fees, reclamation costs (not yet quantified). All these come to, on average, 74,5% of total cooperative revenue per tonne. The fixed costs, which are very small in terms of total averages because they do not apply to all cooperatives, consist of plant hire, service worker salaries, hired labour wages, rent and insurance, and amount to only 11,79% of the total revenue. The result is that there is no level of output at which the marginal and average cost curves are declining so that cooperatives are unlikely to benefit from any economies of scale as increases in production are continuously accompanied by increases in costs.

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80 See Appendix.

- Contrary to the much heralded advantages of vertical integration, cooperative cash flow is rather unpredictable as it is ultimately determined by the buyer. We have already seen how the weight, ore form (lumpy/fines), grade and price are finalised by the buyer. The unpredictable and precarious nature of cooperative earnings has had a negative impact on cooperative creditworthiness, access to external assistance, business with insurance companies, etc. We have also observed (from the 1985 example) that cooperative profit is not only externally determined but also initially minimized as it is ignored in price determination. Equating the price per tonne to its perceived cost of production is not only exploitative but also compels cooperatives to operate as charitable, non-profit-making organizations for the TNCs. A key factor of production which has been grossly undervalued in cooperative mining is labour power. While field calculations show, as a percentage of total revenue, an average 74,5% variable, 11,8% fixed, and thus, 86,3% total cost and a profit of 13,7%, this profit level, which is not at all provided for in price determination, is obtained at the expense of labour as follows:

*From field calculations, the average earning per worker, calculated as the average output per worker multiplied by the amount paid to the worker per tonne, is $156/month which is 16% below the minimum wage. Thus, the March 1988 increase of the statutory minimum wage by 15%, and the consequent increase in the cooperative price by the same percentage had no impact, in terms of the present minimum wage, on mining cooperatives which are still earning, on average, below the old minimum wage in nominal, let alone in real terms. The trend of earning below the minimum wage therefore continues so that, for whatever reason, cooperatives are not affected by statutory wage regulations. Raising the cooperative price by the statutory percentage on wages was a cunning move on the part of the buyers as the price setters assumed that cooperatives were already earning a minimum wage. In this case the price should have been raised by at least 31%.

*Cooperators provide their own housing and recreational facilities which are appallingly sub-standard as there have been little, if any, changes to the (in most cases inherited) compound system. In the past "the conditions of 1972 RALSC (Rhodesian African Labour Supply Commission – changed from RNLSC in 1964) contracts (provided) little incentive or obligation upon employers to provide housing since contracts (allowed) for "wattle and daub" structures with water-tight roofs and "floors of beaten-down earth" to be regarded as "adequate accommodation". And workers (were) virtually powerless under the law to bargain for improvements to these conditions."[81] The situation has not, however, changed for mining cooperatives and the main reasons for this are somewhat similar. Firstly, far from any "incentive or obligation", cooperators simply cannot afford better accommodation because of their meagre earnings. Secondly, even if they might afford minor improvements, they are not allowed to do so by the "law" as the land owner and claim holder do not permit the cutting of trees and grass and the digging up of the soil for the purpose.

*Cooperatives do not have any straightforward or standardised medical aid, workers' compensation, pension and insurance schemes. Even where any of these schemes might be available in one form or the other, they leave a lot to be desired. e.g.:

- The only one cooperative with a pension scheme of $2/t does not at all cater for the post-retirement needs of its members. If, for instance, a cooperative member

81 D. G. Clarke: *Ibid.*, p.80.

produces, on average, 4t/month, he/she would reap only $3 840 after 40 years which, at the present minimum wage of $181, would run out before completing two years.

- The medical fee, where available of $5/worker/month is only confined to the company mine clinic treatments. Any complications beyond the clinic's capability are the worker's responsibility.
- Very few cooperative members who can afford (mostly leaders) have taken up personal life assurance policies with Old Mutual. A vast majority of cooperative members do not have this policy. The only type of insurance arranged for cooperatives is Group Personal Accident which has been taken up with Zimbabwe Insurance Brokers (Pvt) Ltd (ZIB) by a number of cooperatives.[82] This scheme covers cooperatives for death, permanent and temporary disablement. The premium for the group scheme is based on estimated individual annual earnings calculated at 1,2% of the estimated two years average annual salary for each member. The benefits accruing to cooperative members are:
  - death – two years' earnings
  - disablement – a percentage of the death benefit depending on the nature of the disablement, e.g. 75% of death benefit for losing one eye.

Group insurance, therefore, also plays the role of a workers' compensation scheme and can have an added advantage over the workers' compensation scheme in that it can be on a 24-hour basis rather than being confined to working hours. Its major shortcomings are, however, that, unlike life policy, it does not mature after a certain period – just like a fire policy on a house! Further, if a cooperative member resigns or retires after say, 15 years, he/she gets nothing from the insurance company. This is unlike a life policy where on termination of a policy after two or three years, a person is entitled to a refund of his/her premium payments. Like any other short-term insurance, cooperative group insurance premiums are paid annually and in advance. However, if a cooperative member resigns during the year for which he/she is covered, he/she gets a rebate for the remainder of that year which, in most cases, is an insignificant amount.

The ZIB has had problems in collecting premiums from cooperatives and its records for January 1988 revealed that there were only eight fully paid-up cooperatives, three with shortfalls and 17 not having made any payments. Cooperatives could not take up other schemes like group pension because, initially, they could not afford it. In addition, the insurance company could not persuade them to take up other policies because of the problems associated with cooperatives in this area. The major hitches are that:

- some of the cooperative members are already past the retiring age.
- because of the nature of their operations and remuneration based on output sold, they do not have a guaranteed salary, which would affect their premium payments.
- insurance companies cannot be that flexible as to allow premium payment fluctuations as premiums should always be fully paid in advance.
- cooperatives cannot take other policies because they do not have important buildings of their own to be covered and most of them have no equipment worth insuring.

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82 Mr. Tendai, Insurance Broker, ZIB: *Interview*, 17/10/88.

Apart from failing to take up important insurance cover because of meagre and precarious earnings, therefore, cooperatives took up a largely disadvantageous scheme which most of them cannot even afford. In short, cooperatives do not have, and cannot afford, a sound social security scheme.

In light of all these observations, it would be ridiculous to talk and boast about "cooperative profit". Indeed, even with regard to chrome mining cooperatives, we are bound to agree with the observation that:

> Without doubt then, this group of workers' level of consumption and standard of living is one of the lowest, if not the lowest in the (Zimbabwean) economy. Whatever the merits of the 'forced' savings on the workers' long-run welfare, there is reason to agree with the argument that the contract worker represents one of the most exploited of the exploited working-class in contemporary (Zimbabwe).[83]

INCOME DISTRIBUTION

While the piece rate system of remuneration is in itself exploitative, as was explained earlier, by the extent of the stripping ratio, there are possibilities of further exploitation of the direct cooperative producer at two levels:

- Under circumstances where income is tied to output, field calculations show that the direct producer gets, on average, 43% of the total value of his/her product. The other 57% goes into various costs – transport, royalty, consumables, fees, "service" worker salary, etc – and profit as follows:
  31,5% variable costs
  11,8% fixed costs
  13,7% profit.

What is interesting to note is that the bulk of fixed costs (70%) is attributable to "service" worker salaries. The service workers are actually the leaders of the cooperatives and those who earn salaries are mostly the chairmen, secretaries and gang leaders. On average, a service worker earns almost three times (296%) the average income in a cooperative calculated as output/worker multiplied by a worker's earning/tonne. The gap is much wider in the south (351%) than in the north (283%) most likely because of the degree of mechanization and specialization and the income distribution implications. There is more specialization and less individualism in the north than in the south so that there is more equality in the north. It is indeed debatable whether there is an exploitative relationship between the leaders and the general membership within a cooperative as the leaders should be paid more and thus be encouraged to remain leaders. In a system where direct production is the ultimate determinant of cooperative income, a tempting subjective opinion is that a 200% difference in earnings is rather exploitative. Besides, from the 1985 price example, a service worker is supposed to earn 5,5/23, i.e. 24% of an ordinary cooperative member's income. Cooperative internal exploitation, however, is bound to occur because of the arbitrary manner in which service worker salaries are determined. The leaders' earnings are not based on any formula, e.g. they are not related to cooperative average productivity and earnings per member.

Most cooperatives hire labour in the form of casual workers and these workers, who are mostly women and difficult to quantify because of the precarious nature of their

8. D. G. Clarke: *Ibid.*, p.79.

employment, are in some cases exploited by their cooperative employers. Five cooperatives, four of them in the south, pay casual workers an average of 31% less per tonne than their members.

- The second level at which the direct cooperative producer is exploited within a cooperative relates to marketing, particularly with regard to those cooperatives where there is more individualism and less specialization. While, e.g. two or three individual cooperative producers might produce equal amounts (by their "crude" measurements) to fill a lorry with chrome ore, they are required to share the shortfall equally in the event of the weighbridge figure being lower than their estimates. The problem here is that it is impossible to determine which cooperative member overestimated the weight and by how much. The result is that a member who might have over-produced ends up sharing the shortfall equally with those who would have under-produced.

  A further exploitative complication with regard to individual production and collective marketing relates to ore grade and fines. The cooperators have to rely on averages determined by the buyers. They have no way of knowing which member produced which grade and whose ore crumbled into fines and by what percentage.

  In addition, therefore, to very low cooperative productivity, high-grading, externally determined cash flow and exploitative pricing mechanisms, the piece rate system, negligible (if not negative) real profit, the chain of labour exploitation extends into cooperatives with the direct producer and casual worker being the ultimate victims.

Autonomy

RELIANCE ON ZMDC

We have observed that for the most part, a top-down approach was adopted in the formation and establishment of chrome mining cooperatives. A key role was played by the ZMDC in this process. A close liaison, tantamount to a collaboration or alliance as far as cooperatives are concerned, was established between the ZMDC and mining houses. These organizations became the architects of the existing system of cooperative chrome mining as they negotiated and finalized the terms of the tribute agreements and supply contracts, at the exclusion of the affected cooperative labour. Because of the role of the ZMDC and the cooperative concept, the workers failed to utilize the services of the AMWZ which, in this case, is "a legally recognized trade union for the purposes of collectively bargaining with employers who, from tradition, have favoured and sponsored a system of unilateral wage determination in a highly inflexible, autocratic and domineering fashion".[84]

Since cooperatives are not involved in negotiations regarding tribute agreements and supply contracts; they take the terms as given and are required to merely rubber-stamp copies of agreements and contracts. Cooperatives are made to sign for documents whose contents and implications they do not fully comprehend and thus end up making "concessions" like Lobengula. While cooperatives are in themselves separate legal entities which can sue and be sued, chrome mining cooperatives are not allowed to seek an audience with the management of mining companies as they should always go through the ZMDC.

84 D. G. Clarke: *Ibid.*, p.21.

Initially, therefore, cooperative autonomy is hampered by the rather officious nature of the ZMDC which prevents direct interaction and dialogue between cooperatives as producers/workers and the TNCs as consumers/grantors.

Consequently, cooperatives have been made to believe that what they have is the best ZMDC could do for them so the ZMDC "advice" is almost always taken. Indeed, the ZMDC advisers have assumed the role of supervisors and are frequently referred to as such by the cooperators. Whatever democracy that might exist in a cooperative, it is on terms acceptable to the ZMDC. In fact, the general belief is that there is a limit to which participatory decision-making can apply in mining as this can end up in disaster. The popular example is the danger involved in having to hold a meeting underground and vote on a decision on whether or not to put timber support! The generally accepted procedure, therefore, is for the gang leader to dictate issues and make production decisions. Both the gang leader and cooperative chairman are, in turn, accountable to the "supervisor" – the ZMDC cooperative adviser.

THE COOPERATIVE UNION

At the initiative of the ZMDC, 22 cooperatives in the North Dyke formed a union called the North Dyke Cooperative Union registered on August 3, 1987. The objectives of this Union as stipulated in its by-laws are:

"(a) to promote the economic interests of its members and to facilitate their operations;

(b) to provide marketing, bookkeeping, accounting and audit services to its members;

(c) to provide management, financial, legal and technical services to its members;

(d) to supply members with such goods, transport, medical services as may be required and to donate to charities and welfare organizations;

(e) to establish educational and training facilities for the members;

(f) to negotiate contracts on behalf of members and carry out functions as agent of members;

(g) to carry out prospecting work; provide machine repair workshop; purchase member requirements; warehouse and sell plant and machinery and mining consumables to members; and

(h) to undertake projects designed to promote the economic interests of its members;"[85]

From the above objectives, the Union is supposed to cater for the interests of its members instead of the ZMDC. The problem, however, has been the apparent demobilization and ineffectiveness of the Union since its formation. By the time of the field work (more than a year later), only five cooperatives had fully paid up the $3 000 share capital. The Union's assets were a 1962 Land-Rover, two calculators; one explosives room; a canvas tent for delivering explosives; and three timber yards under construction at Muriel turn-off, Caesar Mine and Kaguvi cooperative. Its liabilities have been nothing more than very short-term (monthly) advances of mining stores to be repaid after the sale of chrome ore by cooperatives. In terms of permanent management staff, only an administration manager had been employed.

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85 North Dyke Cooperative Union Limited: *By-Laws*, p.1.

The Union failed to achieve any of its objectives except part of objective (g) because of a number of factors which include:

- the very limited nature of the Union's sources of income;
- lack of ownership rights, not only on mining claims but also on such facilities as houses, clinics, schools, beerhalls and clubs, workshops, etc, which for the most part still belong to ZIMALLOYS;
- continued ZMDC involvement in cooperative affairs and its performance of most of the Union's functions.

Consequently, the Union could only supply mining consumables to its members. This service, however, has not always been readily acceptable to cooperatives. The Union sourced these inputs from secondary suppliers such as ZMDC and TNCs with the result that the inputs became far more expensive to cooperatives than purchasing them directly from ZMDC, TNCs or timber farms. For example, Union prices for carbide and timber are much higher than those of alternative sources:[86]

Table II
COMPARISON OF PRICES

	Union price (Z$)	Other Source (Z$)
Carbide drum	261	190,79 (ZIMALLOYS)
"	261	149 (ZIMASCO)
"	289	149 "
"	265	195 "
Timber 1,2m	2,75 – 3,10	1,12 "

While some cooperatives feel that the Union is useless and they were forced to join it, others are convinced that it is better to buy from their own Union than from alternative sources. This second group believes that buying from the Union at higher prices will help build and strengthen it so that in shadow price terms, Union prices are lower. The merits of this conviction are, however, debatable.

Whatever are the advantages of the Union under present circumstances and whatever are its capabilities and potentialities in the long term, it has proved very ineffective so far. An attempt was made for the Union to take over facilities (houses, schools, clinics, beerhalls, workshops, etc) owned by ZIMALLOYS and the company is said to have promised to hand them over by June 1987. However, it turned out that an agreement could not be reached and the last meeting ever held (by ZIMALLOYS, ZMDC and the Union) on this subject was on September 20, 1987.[87] In short, the Union has failed to deliver the goods, either because it set ambitious targets under present circumstances or, as is the general view, it might be too early to evaluate its performance, or both.

We can only conclude, therefore, that in a system where cooperatives do not own mining claims and other facilities (except their labour), are not involved in negotiating terms of

86 From cooperative records and C. Tapfuma: *Interview*, 20/9/88.
87 S. Garwe, Administration Manager, North Dyke Cooperative Union: *Interview*, 22/9/88.

their operations, deal with monopsonists, depend on the ZMDC have an "infant", ineffective Union; far from being autonomous bodies, cooperatives become externally dependent, manipulable labour entities whose operations do not pose a threat to, but rather serve the interests of, the capitalist mode of production.

THE ROLE OF WOMEN

Field statistics indicate that, of the total cooperative membership of 2 127, only 47 (2,2%) are female distributed as 23/1 637 (1,4%) in the north and 24/490 (4,9%) in the south. It then follows that there is virtually no female involvement in cooperative chrome mining operations. None of the women cooperative members hold leadership posts. The bulk of the cooperative community women are housewives who occasionally undertake casual work as surface (madobadoba) chrome miners. It is, therefore, rather contradictory that the Ministry of Community and Cooperative Development and Women's Affairs, which is responsible for both cooperatives and women, promotes cooperatives which exclude women.

Historically, mining was an exclusively male domain as only male, mostly foreign, contract labourers were recruited, employed and housed in compounds. The capitalist employers were convinced that women could not be productively employed to undertake heavy mining work. The result was that only men developed the necessary skills and acquired the relevant experience in mining. The continued absence of women from mining cooperatives could be explained in terms of male chauvinism or female inferiority complex or both. It is also possible that due to the lack of any socialist/revolutionary ideology, archaic social attitudes are still deeply entrenched in the conservative cooperative community. This is likely to be true because, while it can be conceded that actual mining is heavy work, women could be employed, e.g., as "service" workers.

There are, however, more fundamental causes for the exclusion of women from cooperative activities. These relate to:

- the non-diversified nature of cooperative activities which are confined only to the production and marketing of chrome ore, because of
- the lack of land and mining claim ownership rights and legal requirements preventing or constraining even such activities as firewood and mud collection and grass cutting, let alone other self-reliance, income-generating women's projects.

In more progressive light, though, women's participation under present circumstances will only be reformist as it will not change the status quo – the exploitable nature of mining cooperatives. Does it really matter whether the exploited labour is male or female? Capitalists have always found it more profitable to exploit male rather than female labour, particularly where more physical (than mental) effort is required. One would wish experts on gender issues went beyond "women's lib" sloganeering and tackled the more fundamental problems of the ownership of the means of production.

The Role of the State

The role of the State was alluded to in earlier sections of the paper. What will be done here is to highlight, in summarised form, some of its major policies and briefly discuss their impact on the class structure of the chrome mining sub-sector.

CAPITALIST PHILOSOPHY

The Zimbabwean economy has remained externally dependent and predominantly capitalist despite socialist slogans and promises on the political front since Independence. The main approach has been based on the capitalist ideology where Government determines, or at least influences, the regime under which private companies operate. It has been found necessary to establish a favourable environment under which private, mostly foreign, companies function so as to increase and attract domestic and foreign investment. In this way, private company interests are believed to be national interests with Government's facilitation of private company operations expected to result in the desired national development.

Where the chrome mining industry is concerned, therefore, mining and processing operations have been left under the firm control of the two TNCs, with minor problems like labour disputes being amicably resolved through negotiations. The State is only directly involved at the marketing level through the MMCZ, where it is content with a commission of 0,875% of the gross value of ferro-alloys sold.[88]

REFORMISM

While the initial problem with regard to contract labour, as identified by the Ministry of Labour and AMWZ, was the excessive exploitation of labour, the cooperative option has proved reformist as a solution. We observed earlier that contract labour was opposed on the grounds that:

- the workers' earnings were below the minimum wage because of the low prices paid for their ore;
- there was no security of tenure and the piece rate system was exploitative; and
- the workers had no social security scheme and adequate sanitation and housing.

As a solution to this problem, however, the cooperative concept was agreed upon with the State proceeding to "bless" the tribute agreements and supply contracts between cooperatives and TNCs. We have already seen how exploitative these agreements have become, with the cooperatives not being better off. The cooperators still earn below the minimum wage, have no guaranteed security of tenure (the contract can be terminated any time or may not be renewed), use the piece rate system, have no social security scheme, adequate housing, etc. This has become acceptable this time simply because of the belief that a cooperator is not a labourer but an "owner" employee.

INSTITUTIONAL AND POLICY FRAMEWORK: DUPLICATION AND POTENTIAL CONFLICT

It would appear there is no clear-cut policy on chrome mining cooperatives, especially on which organs of the State machinery should assist these cooperatives and in what ways. The organisations which deal with chrome mining cooperatives are the Department of Mining Engineering of the Ministry of Mines, the Department of Cooperative Development of the Ministry of Community and Cooperative Development and Women's Affairs, and the ZMDC. The Department of Mining Engineering's main duties include the enforcement of Mining and Safety Regulations and Explosives Regulations as per Mines and Minerals Act,

88 M. Rule: *Interview*, 12/10/88.

administration of the Government plant hire scheme, and the provision of technical advice on mining methods to all mines free of charge – if consulted. In carrying out these duties, the Department has Regional Mining Engineers stationed in the four mining districts of the country – Harare, Gweru, Bulawayo and Masvingo. The Regional Mining Engineers are accountable to the Chief Government Mining Engineer based in Harare.[89]

The ZMDC, as we saw, also has, as part of its duties, the ensuring of cooperative compliance with statutory regulations, including the Mines and Minerals Act. This, apparently, is the major preoccupation of its resident cooperative advisers.

The Cooperative Department of Ministry of Community and Cooperative Development and Women's Affairs, on the other hand, is also involved in the promotion and assistance of these cooperatives. They have resident cooperative advisers as well, one at Sutton mine and the other at Vanad mine in the North Dyke. Their main concern is expounding on Cooperative Principles and By-Laws, and this is done free of charge.[90] And, to cap it all in the case of North Dyke cooperatives, there is their Union whose functions and objectives are similar to those of the above organizations. While Government departments (and the Union should) provide their services free of charge, the statutory body, ZMDC, charges a consultancy fee of $3/t for similar services rendered. If simple economic reasoning dictates that one should settle for free services, then cooperatives should only deal with Government departments and their Union. What is clear, however, is that there is duplication of effort and potential conflict in the provision of State services and assistance to mining cooperatives.

THE TEMPORARY NATURE OF COOPERATIVES

Cooperatives are seen as a "stop-gap measure" by the State in that, in line with its capitalist policies, the State has not formulated long-term plans for genuine industrial democracy and worker/cooperative takeover of at least mining claims and other means of production. The cooperatives serve as a stop-gap measure to alleviate high chrome ore production costs for mining companies. This approach is confirmed by the following developments:

- External (Government) assistance, in the form of loans, grants, infrastructure – especially electricity, etc. to cooperatives has not been forthcoming. While it is true that small-scale mines usually employ more labour-intensive methods with a lower degree of mechanization so that their investment cost per tonne of output is lower than that of large-scale mines, their investment requirements increase with mine size, depth of mining, degree of mechanization, etc. We have seen that cooperatives, although still in the small-scale mine segment, have a potential to expand operations and reduce high-grading. The main constraint to this development has been found to be a serious lack of financial resources and infrastructure, particularly electricity. The cooperatives have very little access to bank or public sector lending. We have also seen, when discussing insurance, that the main reason why cooperatives have been largely precluded from the private commercial credit market is their real or perceived high risk level due to their precarious earnings and lack of acceptable collateral.
  Because of its short-term plan for cooperatives, the State found it unnecessary to

89 G. Phimister, CGME: *Interview*, 14/10/88.
90 S. Garwe: *Interview*, 20/9/88.

break this vicious circle with regard to cooperative investment and development. For cooperatives, debt, let alone grant, financing as a source of investment funds has been very difficult to obtain. As a result, the almost exclusive source of funds for cooperatives has been forced savings, supplemented by very short-term (invariably monthly) loans from ZMDC, Cooperative Union and other cooperatives. Very few cooperatives ever benefited from the Government plant hire scheme.

- The State, in agreement and close collaboration with mining companies, has always believed in the mechanization of thin-seam chrome mining as a way of reducing production costs. But before this can be achieved, cooperatives should serve the purpose. Since 1985, efforts have been made to procure a machine which can be taken underground to extract chrome ore from thin seams. This "road-header" machine is supposed to go down the shaft or winze and then follow the seam by cutting a tunnel where it can fit. In this way, much of the labour and explosives would be done away with, and thus reduce mining costs significantly. Overseas mining equipment manufacturers were contacted and the most attractive offer was first made by Dosco Overseas Engineering of the UK. Several trips were made to the UK by Ministry of Mines officials and mining company representatives, samples were sent to the UK for necessary tests, and the suppliers inspected the mines where the Dosco In-Seam Miner was expected to operate. The deal, however, could not go through because "the Dosco project was poorly structured from the very beginning".[91]

Consequently, a committee, chaired by the Minerals Development Unit of the Ministry of Mines and made up of the Government Department of Mining Egineering as specialists, the two chrome mining companies as hosts and implementers of the project, the Institute of Mining Research as rock engineering experts, and the University of Zimbabwe Department of Mining Engineering, was set up to re-examine the issue. This committee identified Atlas Copco-Eichhoff of West Germany as the supplier and discussions are under way for Zimbabwe to import the road-heading machine from West Germany.[92] Some of the main technical problems with regard to this innovative idea were found to emanate from the geology of the North Dyke, particularly the folding and faulting of the thin seams and the hardness or friability of the chrome ore and host rock. It is hoped that, through research, ways will be found round these problems.

The advantages of this project to mining companies are obvious: it is only at the macro level where there might be hitches. For example, the highly beneficial attribute of cooperative mining, that it is labour-intensive and increases employment, is likely to be lost. The long-term costs of the project might be too high, especially maintenance costs, spares and foreign exchange requirements. The cost-benefit analysis of this project is, indeed, a project on its own. What needs to be emphasized here is that this project is a potential threat to the long-term development of mining cooperatives and its formulation and implementation is based on the conviction that chrome mining cooperatives are not here to stay.

In line with capitalist philosophy, therefore, the State has endeavoured to encourage and facilitate capitalist development. Cooperatives were formed as a way of harmonizing the workings of capitalism so that all State policies on chrome mining cooperatives, even if not

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91 Marima: *Interview*, 12/10/88. See also "Mineral Wealth Vital To Development – Nyagumbo", in *The Herald*, Octobe 21, 1988, p.4.

92 Marima: *Interview*, 12/10/88.

clearly defined, serve the purpose of effecting compatibility, rather than conflict, between cooperatives and capitalism. In fact, the State sees chrome mining cooperatives as a stop-gap measure which can be dispensed with once the current research on mechanizing company mines proves successful.

SUMMARY AND CONCLUSION

While post-independence State policies on producer cooperatives might have changed and implied socialist transformation, detailed analysis of the operations of these cooperatives is necessary to determine the extent to which socialism has been achieved at both micro and macro levels. To do this, a conceptual framework which goes beyond descriptive terms and puts mining cooperatives in their proper economic and political context was found necessary and adopted. In other words, a political economy approach to the analysis of the workings of chrome mining cooperatives was taken, with the hypothesis derived in this way being tested against the existing evidence collected through field work. The whole research project, therefore, served as a timely substantiation and analysis of new and emerging phenomena of political and economic life in Zimbabwe. The evidence gathered on mining cooperatives and the chrome mining industry largely confirmed the hypothesis postulated through political economy methodology and pointed to the following realities:-

- When the chrome mining companies were making losses and faced a crisis emanating from rising costs of thin-seam chrome mining as well as pressure to employ and pay labour according to statutory regulations, they sought ways round this problem. The counter-balancing forces employed against the falling rate of profit included the increase in the intensity of labour exploitation, depression of wages below the value of labour-power, and the cheapening of the elements of constant capital. This was done through the cooperative institution so that, for the large part, cooperatives were created as a solution to private company problems.
- The cooperative concept enabled the minimization of labour costs to mining companies. Company payroll workers were dramatically reduced; recruitment, supervision and training of labour was avoided and left to the workers and the ZMDC; tribute agreements and supply contracts benefiting companies more than cooperatives signed and "blessed" by the State; the exploitative piece rate system was retained with the effect of extending the working day by the extent of the stripping ratio; output weight and grade were unilaterally determined by the mining companies as monopsonistic buyers of cooperative output; an exploitative pricing system was devised and implemented, with different prices, not related to the minimum wage, inflation, ferrochrome prices, etc, but equated to the perceived costs of production, being set; and double standards in grading and pricing were adopted. All these mechanisms have been found convenient to the mining houses and have had the effect of minimizing labour costs to the companies, intensifying the exploitation of cooperative labour and thus maximizing company profits.
- Cooperatives also enabled the cheapening of the elements of constant capital by mining companies. Fixed capital, raw and auxiliary material costs were lowered by letting cooperatives use the geologically-dictated labour-intensive technology; by hiring out equipment to cooperatives on an indefinite basis and making them maintain, repair, insure and purchase equipment; by renting out houses and clinics to cooperatives or letting them provide their own housing, medical and recreational facilities; and by making cooperatives pay royalties on company mining claims.

The lowering of labour and capital costs had the effect of intensifying the exploitation of cooperative labour and lowering chrome ore (the most important raw material) costs to company smelters and thus maximizing profits in the face of rising ferrochrome demand and prices.

- These external developments have had far-reaching effects on the internal operations of mining cooperatives. A top-down approach was adopted in their establishment with the key role being played by the ZMDC. Their modus operandi has nothing to do with socialist ideology as it is the geology and mining method which largely dictate the organization of labour. There is more individualism and less specialization on surface workings with the opposite being true for underground operations. The result has been a unique combination of service/marketing cooperatives and "collectives". Because cooperatives have to use capital of lower composition as dictated by the geology, their productivity is very low. Cooperatives are engaged in high-grading at both the mining and mineral concentration levels because of lack of infrastructure and financial resources to purchase equipment and also because of their consumers' requirements of lumpy ore. Because their earnings are externally determined, the cooperatives do not only have meagre earnings, but also an unpredictable cash flow, all of which have a negative impact on their creditworthiness and business with private finance companies. It is improper to talk of cooperative profit because this profit is obtained at the expense of cooperative labour and amounts to a forced saving. Cooperators earn below the statutory minimum wage, have no social security scheme, and lack adequate housing, recreational, etc, facilities. Exploitation is also rife within the cooperative, with the leaders exploiting the direct producer and hired labour.

  Individual production and collective marketing is also exploitative since there is no way of knowing the exact tonnage and grade produced by each individual. Because of their excessive reliance on the ZMDC and the ineffectiveness of their Union, cooperatives are not autonomous bodies but manipulable labour entities which serve the interests of foreign capital. There is virtually no women participation in chrome mining cooperatives. This is mainly because, historically, mining has been an exclusively men's field. Besides, women have limited scope for participation because these cooperatives do not have land and mining claim ownership rights so that their activities are confined only to the mining and marketing of chrome ore.

- The State has always nurtured a capitalist ideology and undertook to encourage and facilitate capitalist development. Cooperatives were formed as a way of harmonizing the workings of capitalism in the chrome mining industry, and the cooperative as a policy option proved reformist as the cooperators are not better off. Due to a lack of clear-cut State policies on chrome mining cooperatives, there is duplication of effort and potential conflict between its organs providing services to these cooperatives. The State, in line with its capitalist philosophy, sees cooperatives as a "stop-gap measure" so that its assistance in the form of infrastructure and loans/grants to cooperatives has not been forthcoming. Instead, in close collaboration with mining houses, the State is sponsoring research on the mechanization of thin-seam chrome mining as a way of reducing costs. Mechanization is a potential threat to the long-term development of mining cooperatives and the formulation and implementation of this project is based on the conviction that chrome mining cooperatives are a convenient temporary measure.

The overall conclusion to this paper, therefore, is that although post-independence Government policies on cooperatives might reflect a more radical approach to producer cooperatives, the essence of their operations is not necessarily radical, in terms of socialist transformation. The main problem lies in the State pursuing two major contradictory policies, namely, the adoption of capitalist ideology in creating a favourable environment under which private companies operate, on the one hand; and the formation and promotion of cooperatives whose objectives are compatible with socialism, on the other. The contradiction, however, is apparently non-antagonistic as the latter has become not only compatible with, but also subordinated to, the former. This overall paradox has also been reflected in the chrome mining industry. Cooperatives have become new forms of surplus extraction which have failed to effect any significant changes in the effective control over the means of production. These cooperatives emerged as part of a solution to a capitalist problem and they were never intended to replace capitalism. It is, therefore, not true that cooperatives are socialist entities and that the strategy is for them to take over the chrome mining industry. To begin with, mining cooperatives lack socialist ideology so that, at heart, they are not "socialist islands" in the sea of capitalism. Their internal operations are determined by the geology and mining method and not by socialist ideology. The cooperatives also lack any transformative potential as they lack ownership rights on the means of production such as land, mining claims, machinery, etc.

While the term "producer cooperative" might imply worker takeover of the means of production and industrial democracy, chrome mining cooperatives are very far from this attribute. They have turned out to be rather cosmetic, reformist structures which facilitate the exploitation of labour. The cooperative venture allowed for the neglect of indispensable outlays on labour and capital by the two mining companies and the State encouraged this process in line with its overall capitalist objectives. Indeed, cooperatives are a stop-gap measure which has been "hijacked by the mining companies".[93] All in all, therefore, cooperatives have become instruments for modifying and perpetuating the system of corporate imperialism as they have had no impact on the class structure and the ownership pattern of the chrome mining industry.

Recommendations

From the above exposition and research findings, it would appear there is need to make two types of recommendations. It is necessary to suggest and distinguish between short-term and long-term measures for enhancing the development of chrome mining cooperatives and socialist transformation.

Short-Term Recommendations

The short-term recommendations, which are reformist measures, would include the following:

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93 Marima: *Interview*, 12/10/88.

COOPERATIVE INTERNAL OPERATIONS

- The establishment of a strong link between cooperative objectives and socialist ideology which can be effected by the various cooperative-promoting State organs through political economy education.
- Increased cooperative autonomy to be achieved through participatory decision-making, effective operation of the Cooperative Union, and reduced outside interference.
- Streamlined and efficient cooperative organizational structure with well-defined and specialised duties for Management Committee members to avoid duplication of effort and conflict.
- More equitable distribution of income within cooperatives to be achieved by relating leadership earnings to average cooperative productivity and earnings and then agreeing on differentials which, ideally, should not exceed 50%; and an end to the exploitation of hired labour.
- An end to the piece rate system, a re-organization of labour to increase specialization and allow for collective production and marketing, and agreeing on a fixed wage remuneration system which would eliminate the variation of the wage bill with changes in output.
- Increasing women's participation by encouraging them to join mining cooperatives and allowing them to undertake certain specialized tasks and to take up leadership posts.
- Training cooperative leaders in specialized areas such as mining engineering, personnel management, bookkeeping/accounting, etc.

TRIBUTE AGREEMENTS AND SUPPLY CONTRACTS

A thorough re-examination of the tribute agreements and supply contracts between cooperatives and mining companies is necessary, and these could undergo major surgery in the following ways:

- An end to the payment of royalties by mining cooperatives and the working out of some formula for cooperatives to benefit from the depletion allowance.
- Allowing cooperatives to own the company equipment which has been on indefinite hire and to provide a hire purchase option for equipment supplied to cooperatives; as well as the takeover of company mine houses, clinics, beerhalls, etc, by the Cooperative Union on fair terms.
- An end to double standards in the marketing system, e.g. TNC acceptance of private tributor ore fines and rejection of cooperative fines, the north/south price differences, and ZMDC fee differentials.
- Working out a formula to relate the ore price to:
  - the minimum wage
  - the ferrochrome price index, given that chrome ore is the major raw material (over 80%) in ferro-alloy production

- the rate of inflation, on both production inputs and consumer goods, and negotiating prices on a more frequent basis, e.g. quarterly.

There can be debate on the question of considering the minimum wage in chrome ore price determination. The argument is usually advanced in terms of the shadow wage. The cooperators' shadow wage is said to be much lower than what they are getting because if they were to leave chrome mining altogether, they are unlikely to find gainful employment elsewhere, will not take up agriculture as an alternative as they do not have the land and the skills in this field, and thus become a burden to the State social services. Their best bet, it is concluded, is their present earnings from cooperative mining so that it was out of patriotic and philanthropic sentiments that companies allowed cooperatives to tribute their claims.

This argument, however, can be countered by the chrome ore shadow price argument. In 1987 when all the 28 cooperatives were fully operational, they employed an average 46% of the total chrome mining labour force and produced 14% of the total chrome ore for the smelters.[94] This figure should be much higher in terms of North Dyke tonnages. The chrome ore shadow price is definitely far higher than the existing one as it would be very expensive to produce the same tonnages without cooperatives. Taking into account the high costs of mining thin seams, the stripping ratio and statutory labour regulations – particularly paying labour on hours worked rather than on output, the mining companies would not afford thin-seam chrome mining. Besides, this was the main reason why they opted for cooperatives in the first place. The ore shadow price is much higher than the extent to which the cooperative shadow wage is lower. Under present levels of technological development and as long as no progress has been made on mechanization, in doing away with cooperatives, companies will most likely reduce production or make losses on ore production or both.

The result will be that they will operate their smelters below capacity, fail to meet ferrochrome supply quotas abroad, lose the market and, most important, foreign exchange. They would, therefore, be better off increasing cooperative ore prices to allow for minimum wage earnings and still avoid expenditures on plant and equipment, energy, statutory wages and other labour requirements, supervision and training, consumables, land reclamation, etc.

- Allowing for more flexibility in monitoring the weighing, sampling and grading system by increasing cooperative representation and permitting cooperatives to seek an audience with mining companies, their customers.
- An end to the consideration of cooperatives ore fines as outright losses as there are no dumps for cooperative ore fines.

EXTERNAL ASSISTANCE

- There should be clear State policies on chrome mining cooperatives together with clearly defined terms of reference for State organizations assisting cooperatives.
- The issue of ZMDC remuneration should be seriously reconsidered; either Government should subsidize ZMDC operations or the TNCs should contribute or both, with cooperatives paying an affordable and fixed consultancy fee that is not tied

94 H. Chiwawa: *Ibid.*

to output. A strategy for gradual withdrawal of ZMDC involvement accompanied by increased Cooperative Union activity should be worked out.

- Consideration of mining cooperatives as a stop-gap measure should be stopped and fresh policies on cooperative investment and finance formulated and implemented. For example, the State could take a leading role by guaranteeing soft loans to cooperatives and end the discriminatory lending policies of existing financial institutions. All the necessary infrastructure, especially roads and electricity, should be provided.

Long-Term Recommendations

The long-term recommendations relate to the ownership structure and transformation aspects as follows:

- The bottom-up approach to socialist transformation is a non-starter. It is necessary to have fundamental changes in ideology at the top and to move away from the current commitment to capitalist development. Socialist promises made on the political front should be fulfilled in the economic field. The State should therefore rearrange its priorities and undergo radical change first in order to facilitate the implementation of effective socialist policies.
- After these necessary changes at the top, there should be effective worker participation and State ownership and control of the chrome mining industry in view of the fact that chrome is a strategic mineral. Well, maybe it is not a strategic mineral to us but it is a major foreign exchange earner whose extraction is monopolized by the two TNCs.
- There is need for a re-examination of the mining claim holdings system and to make any necessary changes in the legislation. For example, while there have been changes to the Mines and Minerals Act which allow for the forfeiture of an unworked mining claim to the State, the legislators could be more progressive by allowing for the takeover of a tributed claim by the tributor after a certain period.

The success of the last two recommenations, and any other policy measures for that matter, depends on the extent to which the first recommendation would have been implemented, otherwise the result is the usual State capitalism which is also reformist.

APPENDICES

Table 1

COOPERATIVE MEMBERSHIP AND EARNINGS

CODE	COOPERATIVE	MEMBERSHIP		EARNINGS/t(Z$)	
		FEMALE	TOTAL	MEMBERS	HIRED L
1	Nehanda	10	250	25	25
2	Ngezi	3	39	27	22
3	ZACRO	0	14	20	–
4	Kushingakukura	4	59	20	17
5	Makomborero	2	68	39	25
6	Tangawaedza	5	60	39	28
7	Dzikamidzi	0	46	40	42
8	Rod Camp	0	52	40	40
9	Rugare	0	68	40	–
10	Tavakuenda	5	145	40	40
11	Power	0	62	50	50
12	Nhamo	0	45	50	42
13	Ntamoyata	0	57	50	–
14	Shumba	0	54	50	–
15	Wakundwa	0	47	50	–
16	Chemakomo	0	47	35	35
17	Tichatonga	0	44	35	35
18	Nherera	0	52	35	35
19	Kaguvi	0	65	45	45
20	Bhibho	0	117	50	50
21	Taisireva	0	43	30	–
22	Nyikandeyedu	18	187	40	40
23	Tongogara	0	54	40	40
24	Chinokura	0	59	40	40
25	Tinei	0	52	40	–
26	Shunguyaguma	0	103	45	45
27	Garetanganhamo	0	108	45	45
28	Muzare	0	130	45	45
	TOTAL	47	2 127	(Ave) 39	(Ave) 37

NB 1-6 South (Ngezi/Lalapanzi); 7-28 North (Mutorashanga)

Table 2

% VARIABLE COSTS/t

COOP	REVE-: PRICE/t 45% GRADE	WAGE %	SER-VICE WKR	CONSU-MABLES	TRANS-PORT	ZMDC FEE	ROYA-LTY	TOTAL
1	84	30	–	2	30	4	–	66
2	84	32	–	5	24	4	5	68
3	84	24	6	–	30	4	0,4	64
4	82	24	–	–	29	4	–	57
5	84	46	–	2	9	4	0,6	62
6	84	46	–	7	9	4	0,6	67
7	83	48	–	17	–	2	3,3	70
8	83	48	–	29	–	4	3,3	84
9	90	44	–	33	–	3	0,6	81
10	90	44	20	22	–	3	0,6	90
11	119	42	8	11	–	2	5	68
12	119	42	–	17	–	3	5	67
13	119	42	–	12	–	3	5	62
14	119	42	–	15	–	3	5	65
15	119	42	–	11	–	3	5	61
16	83	42	–	32	–	–	3,3	79
17	83	42	–	35	–	4	3	84
18	82	43	–	59	–	4	3	109
19	90	56	5	23	–	3	0.6	82
20	90	56	3	12	–	3	0,6	75
21	119	25	–	36	–	3	5	69
22	83	48	–	18	–	4	5	75
23	83	48	–	29	–	4	5	86
24	119	34	–	31	–	4	5	73
25	119	34	–	38	–	3	5	80
26	90	50	–	25	–	3	0,6	79
27	90	50	–	14	–	3	0,6	68
28	90	50	–	42	–	3	0,6	96
TOTAL AVERAGE	95	42	2	21	(22)5	3.32	3	96

Table 3
% FIXED COSTS/t

Coop	Plant Hire	Ser-vice Wkr Salary	Hired Labour	Rent	Insu-rance	Total	Total Cost (Fixed + Var.)	%VC	Profit (Loss)
1	–	6	–	0,4	0,5	7	73	90	27
2	5	7	–	2	0,3	14	82	83	18
3	–	–	–	–	0,1	–	64	100	36
4	–	20	–	–	0,3	20	77	74	23
5	–	1	–	–	0,1	1	63	98	37
6	–	5	–	–	0,6	6	73	92	27
7	–	12	–	–	–	12	82	85	18
8	–	12	–	–	–	12	96	88	4
9	–	11	1	–	2	13	94	86	6
10	3	10	–	–	0,8	14	104	87	(4)
11	2	–	–	4	–	6	74	94	26
12	2	–	8	2	–	12	79	85	21
13	1	8	–	3	–	12	74	84	26
14	1	11	–	3	–	15	80	81	20
15	1	5	–	3	–	9	70	87	30
16	2	2 1	–	4	–	27	106	75	(6)
17	0,5	26	–	4	–	31	115	73	(15)
18	2	18	–	6	–	26	135	81	(35)
19	–	4	1	–	–	5	87	94	13
20	–	–	–	–	1	1	76	99	24
21	5	9	–	6	–	20	89	78	11
22	0,5	2	–	4	0,4	7	82	91	18
23	2	3	–	3	0,4	8	94	91	6
24	2	9	–	3	0,3	14	87	84	13
25	–	6	–	5	–	11	91	88	9
26	0,3	5	0,8	–	–	6	85	93	15
27	–	7	1	–	–	8	76	89	24
28	–	12	–	–	–	12	108	89	(8)
TOTAL/ AVERAGE	1	8	0,4	2	0,2	12	86	87	14

Table 4
INCOME DISTRIBUTION

Coop	Out-put/ Wkr	Wage /t	Ave Monthly Wage	Chair-Man Salary	%ave	Secre-tary Salary	%ave	Gang Leader Salary	%ave
1	3	25	75	500	667	400	533	300	400
2	15	27	405	461	114	431	107	351	87
3	11	20	220	–	–	750	341	–	–
4	6	20	120	350	292	325	271	289	241
5	9	39	351	355	101	350	100	–	–
6	3	39	117	350	299	340	291	–	–
7	3	40	120	220	183	206	172	214	198
8	2	40	80	224	280	213	266	206	258
9	2	40	80	223	280	202	253	216	270
10	2	40	80	299	374	270	338	236	295
11	2	50	100	130	130	120	120	110	110
12	4	50	200	200	100	200	100	200	100
13	4	50	200	300	150	290	146	250	125
14	3	50	150	300	200	290	193	240	160
15	3	50	150	200	133	190	126	170	113
16	1	35	140	377	269	359	256	300	214
17	3	35	105	416	396	381	363	358	341
18	2	35	70	250	257	220	314	210	300
19	3	45	135	648	480	600	444	–	–
20	3	50	150	400	267	400	267	200	133
21	2	30	60	250	417	200	333	–	–
22	3	40	120	340	283	200	167	–	–
23	3	40	120	300	250	250	208	–	–
24	4	40	160	345	216	312	195	230	144
25	2	40	80	300	375	230	288	–	–
26	3	45	135	266	197	230	170	250	185
27	2	45	90	240	267	220	244	230	256
28	1	45	45	252	560	229	509	241	536
TOTAL/ AVERAGE	3,8	39	138	303	273	300	254	171	160

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