

3.2.2 Previous Works and NGO Support

a) Performance of the Senkelle Sandstone Quarry Operation

The study area is well endowed with large deposits of sandstone resources. The sandstone is an Upper Sandstone and is a clastic sedimentary rock composed of indurated sand grains, most of which fall within the size range of 2 to 0.06. It is fine to medium grained in friable. The color is generally gray, brownish gray, pale brown, pinkish, yellowish and reddish of combination of one or two of the color kinds above. The resource is estimated to be more than 3 million Senkelle Sandstone (locally called for about 100 years Dhaga Gurage). It is commonly known for its dimension stone or ornamental stone used in construction industries for decorating purposes.

b) NGOs Support

Limited efforts have been made in the past to improve livelihood in the kebele. Both the farming community and the artisanal miners use backward means of production. Social amenities are lacking and most of the community members live below the poverty line. There is no regular NGO support given to the kebele. NGOs came to the area on their own. They make selection of the communities to be served. In fact three NGOs are operational in the entire district. So far, they have roles in meeting the needs of the community, e.g. water source development.

3.2.3 Characteristics of Social Groups

Key social groups were identified during the PRA process by community members who divided the community into groups on the basis of economic activities as indicated below:

- Farmers
- Persons involved in farming and artisanal mining
- Artisanal mining license holders
- Artisanal miners

- Service providers/petty traders
- Civil servants
- Production plant workers (Ambo Mineral Water & Senkelle Lime Stone Production Plants)

Box 2. Livelihoods Analysis of Social Groups

A listing of social groups by assets shows that there are very poor (*deegaa*) better off (*harka qal'aa*) and rich persons in the community.

- a) The *deegaa* or the very poor do not have property (land, livestock, a private dwelling, furniture etc.) except a meager amount of income from their labour. Many live on alms.
- b) The *dhaba* or the poor have small huts, with mud walls and thatched roofs, less than two cattle (1 ox and 1 cow or 2 of one type), 2-3 goats or sheep, very small amounts of cash (10 Birr being a big amount for them). They sell firewood, prepare and sell charcoal, local drinks like *Ferso* and *Katickala* to augment their low incomes from farming or physical work. They do not have enough food during the rainy season and are vulnerable to starvation. They mostly subsist by working for households who are relatively better off.
- c) The average *Harka Qal'aa* or the better off households have the private hut, about four cattle, 2-4 shoats and perhaps a donkey. The households can produce or obtain food for own consumption but may be exposed to starvation during the rainy season, though not very severely.
- d) The rich among the farming population are said to have;
 - 2-3 hectares of land
 - their own houses mostly with mud walls and corrugated iron roofs
 - furniture
 - more than seven cattle
 - more than ten shoats
 - numerous chickens
 - two pack animals
 - more than 3 quintals of reserve crops (different types) in the house
 - more than 2000 Birr in cash.

Box 3. Income of Artisanal Miners

The participants in the community discussion also stated that among the artisanal mine license holders, all of whom are males, the very few who are regarded as rich, make 40,000 – 50,000 Birr a year with 25% profit. The annual income of most license holders is Birr 10,000. They are identified as the better off group. Their average land holding is 700-800 square meters. Each one of them have a private house and furniture. Production tools owned by a license holders are on the average;

- 10 big hammers
- 12-15 spades
- 50-70 chisels, and
- 10 hoes.

Artisanal miners may be categorized as either poor (e.g. the daily laborers) or the better off (the semi-skilled and skilled workers. The daily laborers do not generally have property. They earn 5-6 Birr/day. The semi-skilled and skilled workers have some properties like houses, furniture etc. Some possess land.

Among female household heads, the very poor have no property (land, house, furniture, domestic animals etc.). They get meager incomes by working for other households or selling fuel woods. Likewise there are better off female household heads who own a comparable amount of property as the males in the same class. The rich among the female household heads on the overage possess 2-3 hectares of land, a pair of oxen, 2 or more cows, more than 5 goats or sheep and a donkey.

Ranking of activities undertaken by community members shows that;

- The first activity of poor farmers is agriculture while artisanal mining takes the second place.
- The reverse is true for artisanal miners, artisanal mining being the main activity and farming the second.
- Agriculture is the only activity of rich households.
- Rich artisanal miners are involved in artisanal mining, trade and agriculture hierarchically.
- Poor female household heads are principally engaged in trade while the activities of those who are considered rich are in the agricultural sector.
- Elderly people tend cattle in the farming sector and work as artisanal miners.
- The youth are active in both farming and artisanal mining.

- Females working in agriculture do weeding and those in trade produce and sell “*farsoo*”, “*daadhii*”, *kaatikaalaa*, food, firewood etc. Some kids who are below the age of 15 years work on artisanal mining sites as chisellers and transport laborers.

3.2.4 Role of Artisanal Mining in the Village

The role of artisanal mining activities in the development process is recognized if not fully understood. The artisanal mining activities have significant contribution towards the alleviation of some of the socio-economic problems in the village under consideration. Some of these are discussed below:

a) Employment Generation

Increased sandstone production by artisanal mining means and the use of these dimension stones to support the industrialization of the region to supply mineral- based products for the economies of the region will contribute towards alleviating the growing regional unemployment and declining real per capital incomes.

The intensified promotion of awareness of the general population on the role of minerals in development, the awareness of how to develop and use these construction materials to meet their own needs, the increased use of labour-intensive technologies for the construction and maintenance of physical infrastructure, etc. are some of the factors that will enhance employment generation at a village level. Consequently more than 800 persons are currently engaged in the activity.

Generally artisanal mining in the village under consideration play a key role in the growth of other economic sectors such as industry, trade, agriculture, and social infrastructure.

b) Provision of Better Construction Materials

The expanded artisanal mining products and utilization of cheap building materials such as Senkelle dimension stone and clay product potentials could improve the quality of house construction and reduce the dependence on wood which has become scarce resource in the area.

The development of skills in the production of cheap but durable building materials from locally available mineral resources and housing construction contribute to improved human settlement and housing in the region, through the artisanal mining operations.

c) Creating Better Market for Agricultural Products

Artisanal mining operators are the most consumers of farm products in the village offering better price for the farmers' produces. It also provides a market income for petty traders. Hence, the potential for the expansion of sandstone/dimension stone and other available minerals output in the village is considerable.

3.2.5 Institutions and Service Provision

a) HIV/AIDS Committee /CBO

Recently a committee of (6-8) composed of elders, *Idir*, *Mahaber*, women's, teachers, DA's, etc. was established in Senkelle and Farisi kebele by the Guder Wereda Council.

This health committee handles health matters especially related to HIV/AIDS problems but requires a serious action oriented implementation programme. To make it effective and useful, its activities will have to be further coordinated with those of the kebele Development Coordinating Committee.

b) Women's Development Committee

Women's Development Committee are yet on the process of formation in the Senkelle and Farisi Study area. Pursuant to the resolution passed by the community.

c) Village Development Committee

The Village Development Committee is responsible for the coordination and carrying out of all the development activities in the kebele.

Social service institutions are almost none existent in Senkelle and Farisi Kebele. The only service rendering institution is the elementary school. Mutual assistance associations like *Idir* and *Iqub* are set up in the area to give some support to the livelihood of the community. Basic social services like health facilities, safe drinking water, etc. are lacking.

3.2.6 Problems and Constraints

At the moment the major problems of the artisanal miners in the locality are related to product quality owing to the use of traditional equipment and the inability to penetrate the market.

Drinking water shortage is also a sever problem in the study area especially in the dry season. To alleviate this problem, the protection of the available springs for domestic use and animal consumption would be necessary.

The presence of various diseases including HIV/AIDS coupled with lack of health services is another major problem of the area. This requires an urgent response.

3.2.7 Major Issues and Recommendation

Major issues that require immediate attention and the suggested possible measures are summarized below.

Summary of Main Issues Arising and Possible Solutions

No.	Issues	Possible solution
1	Lack of prospecting and exploration activities to discover for more exploitable reserves/resources of sandstone, constraining a new quarry face openings.	In order to assess for more economic potential of the Senkelle upper sandstone particularly the area north of the existing quarry areas, carryout detail and systematic exploration work including: trenching, pitting/drilling, sampling, etc. The exploration for potential deposits such as gypsum, clay, limestone, etc. are another long-term means of income generation source for artisanal miners.
2	Problems associated with the marketing of the product i.e. the license holders mainly depend on middlemen or on-the-site collectors who purchase on the site at relatively low price and sell at high price in Addis Ababa.	<ul style="list-style-type: none"> • The quarry owners and artisanal miners should directly involve in marketing of their products so that they may be the direct users of the fruit of their labour and endeavors, thus avoiding the role of the middlemen. • Encourage the formation of small mining ventures possibly in form of cooperative mining societies for effective technical assistance, control and funding.
3	The quarrying and processing methods of sandstone for dimension stone in-use are inefficient resulting in improper utilization and failure to give attention to conservation of the sandstone resources.	<ul style="list-style-type: none"> • Substitute a proper mining and processing technology through appropriate training and improved semi-mechanized techniques.
4	Lack of basic infrastructure in particular the in availability of safe water and health services is the acute problems of the area: health problems particularly those arising from HIV/AIDS and malaria infection are given little attention.	<ul style="list-style-type: none"> • Give utmost attention to the development of infrastructures with particular emphasis to the construction of all weather access roads that connect localities where mineral/rock resources have been identified with at least main asphalt roads and centers where services are rendered. All stakeholders (government, NGOs the private sector and communities) should be involved in creating conducive health and safety situation in the artisanal mining areas by strengthening existing basic series in terms of staff and equipment and also by undertaking HIV/AIDS sensitization

5	Low level of knowledge and awareness about environmental protection and importance by the public in general and artisanal miners in particular resulted in environmental degradation and loss of life & properties.	<ul style="list-style-type: none"> • There is an urgent need for meaningful environmental education as well as rehabilitation and reclamation measures to restore the quarry sites to their pre-quarrying status. Periodic training and continued safety reminders to all miners.
6	All operational quarries are owned by a few license owners and as such resulting conditions of work of miners are unsatisfactory.	Strengthen the institutional framework for safeguarding the interest of artisanal miners by extending the services of the labour in sectorate and establishing co-operate producers cooperatives.

3.3 Situation Analysis

3.3.1 General

In Ethiopia it is estimated that more than 500,000 persons earn their livelihood from artisanal mining activities. But as a result of low economic performance of the country, population pressure and degradation of the natural resources base this traditional, mainly informal, activity has become poverty driven and unsustainable. The living conditions of the artisanal miners are dismal. Many have gone to Hayadima from their home areas with expectations of bright future. Some went because they have committed crimes in their place of origin.

From PRA exercise, it was noted that artisanal mining community members consider the activity to be demanding hard work without commensurate returns. They identified themselves as the working poor without assets that can be used for development. For many individuals and communities, artisanal mining is a means of subsistence livelihood.

They expect service-providing institutions (government as well as non-governmental institutions) to provide them with the necessary support for emerging from the dismal livelihood situation. Their perception is that promotion of opportunities of facilitating the upgrading of the artisanal mining activities and developing alternative and complementary as well as socially responsible actions. They expect that such actions could enable them to make important contributions towards economic growth and poverty reduction. More specifically, their proposed solutions or livelihood strategies are natural resource based and rest on coverage of their sector by government development efforts in terms of making land available for alternative livelihood strategies along with the creation of better infrastructural and basic social service facilities for them. They also indicated that diverting rivers for agricultural production purposes could be made feasible if government support is available while it is incumbent on them to make contributions in terms of labour.

3.3.2 Assets

The majority of artisanal miners do not have assets worthy of mention for use in improving their livelihoods. They do not possess land, have no private houses or at best own dwellings of low standard and use primitive tools which they often share for production. In brief, the need for support in terms of tools, product quality and quantity is clear so as to improve their livelihood. In this connection it is worth mentioning that credit facilities can play an important role. On the positive side, the youthfulness of the majority of the recent migrants and their exposure to hard work can be considered as valuable condition for creating improved livelihood if deployed elsewhere as proposed in the study report.

In considering the above-mentioned alternative livelihood strategies, it is important to note potential vulnerabilities which may impede or even hinder implementation programmes.

The decline in the mineral resource which is exploitable by artisanal miners' shortage of water both for human consumption and production and environmental degradation are considered to be restricting conditions in the efforts to be made for the realization of the proposed activities. Other potential vulnerabilities would be the question of providing adequate markets and transportation facilities for the products to be obtained through the proposed livelihood strategies as well as the maintenance of healthy relationships among community members coming from different places of origin, particularly in the process of developing a sound cooperative movement.

3.3.3 Possible Conflicts

Negative attitudes towards artisanal miners were observed in the study areas because of:

- Illegality as they do not have policy support and lack legal recognition;
- Smuggling activities which along with their illegal status characterize them as uncontrolled;

- No return to the government since there is no account of their production and income which is obtained mostly through black market;
- Conflict of interest in the use of natural resources due to illegal and proper use of the mineral deposits, degradation of the land decreasing its production and suitability for human habitation. Preservation of forest and wildlife is also endangered.
- Migration of people to the mining sites from different parts of the country, particularly from urban areas is regarded as a cause for the spread of epidemic diseases especially HIV/AIDS.
- The increasing population pressure on the land which is one of the effects of migration is regarded as a cause of poverty in Hayadima.
- The recent excessive inflow of migrants which is considered to have increased pressure on land and prices of consumption goods thereby deepening the poverty situation in the area.

3.4 Summary of Major Issues Showing Differences and Similarities Between the Two Case Study Sites

3.4.1 Similarities

Hayadima	Senkelle
<ul style="list-style-type: none"> • Adequate access to markets, low land and labour productivity; • Traditional and backward methods of production. 	<ul style="list-style-type: none"> • Adequate access to markets; • Traditional and backward methods of production;

3.4.2 Differences

Hayadima	Senkelle
<ul style="list-style-type: none"> • Endowed with forests, wildlife, mineral reserves and rivers in the district which flow all year round; • No river that can be used for irrigation passes through the Kebele, but some which can be used for such purpose are not far away. • A hardworking workforce, a very significant portion of which is migrants. School leavers are also found there. • Poor basic services (health, education, water supply, housing, roads, electricity, etc.) • Unsustainable livelihood: most artisanal miners do not have assets. Incomes are not regular and unreliable. Movable deposits are being exhausted; • Seasonal impact is relatively high affecting wet mining activity; 	<ul style="list-style-type: none"> • Endowed with good farm land suitable for production of cereals (teff, wheat, sorghum, etc.) and livestock production. The natural resources are depleted. Vegetation cover is removed and the land is overworked. Land and labor productivity is low; Presence of industrial stones, mineral water and lime factories; • Presence of rivers that can be used for diversion and irrigation purposes within the kebele; • A well disciplined and hardworking resident human resources though largely illiterate; • Poor basic services (health services, education, water supply) roads, electricity, etc. However, the services rendered near Senkelle are relatively more accessible; • More sustainable livelihoods. Incomes are regular and reliable. Raw material reserve is reliable. Most artisanal miners have assets although of poor quality. They do not own or possess the land on which they work and even the hand tools; • Seasonal impact is relatively low affecting the dry quarrying activity;

Hayadima	Senkelle
<ul style="list-style-type: none"> • Less opportunity of coping strategy since there is little off mine activity; • Expressed desire of the community representatives in the PRA is to partially mechanize the production process through the use of improved technology (use of dozers, pumps, mills, etc.); • Highly sensitive inter-household relationships between Gujii residents and the recent migrants. Migrants who have resided in the area for a long time enjoy the tolerance of both the residents and the recent migrants 	<ul style="list-style-type: none"> • Better coping strategy since there is mine activity. Farmer miners earn some income from farming as well; • License holders/ employers were worried about increase in the cost of production if the production process is partially mechanized. The artisanal miners or the employees were of the opinion that such devices would reduce the labor intensity of the production process thereby causing reduction of workforce. • Inter-household relationships are marked with tolerance and mutual support. Attitude of the farming community towards the artisanal miners is positive.

4 ISSUES RELATING TO SUSTAINABLE LIVELIHOOD IN ARTISANAL MINING COMMUNITIES

4.1 Improving Jobs, Incomes And Growth

4.1.1 Policy Environment

The size of the labour force has shown a significant increase from 14.7 million in 1984 to 26.5 million in 1994 (between the first and second census years) due to the growth of the population at an increasing pace, the shift in the structure of the population and observed upward shift in activity rate, particularly that of women. Still an upward growth trend is being noted.¹⁰

With a large number of job seekers entering into the labour market each year, engagement in the informal sector activities is growing rapidly. Lack of formal sector employment opportunity and skill has resulted in low paying, unregulated and poor working conditions. This is, therefore, the main reason why the number of people who migrate to Shakisso woreda in search of informal employment opportunities as artisanal miners has increased in the last five years.

Artisanal mining is an important source of income for many unemployed or underemployed persons in the country. It is a source of employment for those who are faced with open unemployment and a critical survival strategy for supplementing meager farm incomes particularly where drought is recurring and agricultural output is on the decline. However, in order to improve jobs, incomes, productivity and working conditions, conducive policy environment is required.

Prior to 1991, the right to prospecting, development and exploitation of minerals was exclusively reserved to the state. The Investment proclamation of 1992 (No. 15/1992)

¹⁰ MEDaC – Survey of the Ethiopian Economy September 1999, Addis Ababa.

reserved large-scale mining to the Government or joint ventures, with government share amounting to at least 51%. The indigenous private sector was restricted to quarry stones and small-scale mining operations. Further revisions were made to the proclamation in 1993, enlarging private sector participation in mining. The proclamation stated that illegal and wasteful artisanal mining will be streamlined to bring about law and order, as well as safety and curb environmental degradation. Artisanal miners in Ethiopia have few rights and can be displaced by commercial miners. Although the mining code provides arrangements for the issuance of concessions to artisanal miners, inadequate enforcement, and complete disregard of mining conditions have made life extremely precarious. The license of artisanal miners excludes all tunneling and other underground work except vertical excavations of less than 15 meters in depth. Artisanal mining license shall be valid for one year but could be renewed as need be.

The low-skilled job seekers have poor prospects to be employed even if the overall macroeconomic environment improves. Hence, among the aims of the new education and training policy is improving, developing and conserving trainees' environment for the purpose of an all-rounded development by diffusing science and technology into the society. The policy also seeks to solve problems of relevance, quality, and accessibility as well as equity of education and training in the country. It also intends to enrich problem-solving ability of trainees and graduates. Democratic values will be promoted to create conditions for equality, mutual understanding and co-operation among people.

With regard to employment and labour relations, the policy environment is based on the labour Proclamation No. 42/93 which, among others, embraces the following provisions:-

- a) Elements relating to contract of employment and determination of wages:-
A contract of employment is deemed to exist when a person agrees to perform work for an employer directly or indirectly for a definite or an indefinite period of time or piece-work in return for remuneration. The law also requires that the type of employment, place of work, the rate of wages and method of calculation should be specified in the contract.

- b) Regarding hours of work a maximum of eight hours a day and forty-eight hours a week is fixed. Work done in excess of the normal daily hours of work is deemed to be over time. A worker is entitled to a weekly rest of consecutive twenty-four hours. Paid public holidays are also provided for. Annual leave is part of the legal entitlement of workers.
- c) Among the activities prohibited to young persons are mining and quarrying (art-89). Employment of women on types of work which may be deemed arduous or harmful to their health is also forbidden by the law (art.87).
- d) Employers have a legal obligation to take the necessary measures to safeguard adequately the health and safety of their workers (art.92). They are liable for employment injuries sustained by their workers and the liability is determined depending on whether it is the worker's fault or not and according to the extent of injury (art. 99-101).
- e) The Ethiopian labour relations system is based on the right to organize which is an important aspect of human rights as laid down in the constitution of the country (art.31) and article 113(1) of the labour proclamation.

The Government has provided incentives to participants in mining. A holder of large-scale or small-scale mining license pays 35% income tax on taxable income according to Proclamation No. 53/1993. The rate of taxation was 45% before 1993. The Proclamation also provided that income tax shall not apply to artisan mining operations.

4.1.2 Situation in Artisanal Mining

a) Employment Structure

At national level artisanal mining has created opportunities for over 500 thousand persons of which 200 to 300 persons are engaged only in artisanal gold and salt. As per the group discussions held with the community, employs and other key informants, in Hayadima alone about 8000 persons are said to be involved in artisanal mining. In Senkelle, 800 to 1000 persons work on the quarries.

Persons related to mining activities can be categorized principally by their mode of association with the activity into manual operators who work independently or as piece rate workers, traders and service providers.

Information obtained through PRAs about their age distribution indicates that more than 50% of them are young adults in their prime age i.e. below 40 years of age.

The artisanal miners in Hayadima site operate more as members of teams of independent operators. Each team jointly owns basic production implements and sells its product to either license holders or traders. In Senkelle miners receive tools from the license holders who also pay for the product often on a piece-rate basis. The operation in the Hayadima artisanal gold mines consists of mainly pitting on already mechanically worked sites or tailings. It involves removing the over burden by digging up to 20 meters deep. Pits are also joined by boring holes side ways forming underground compartments. Once the layer containing gold particles is struck and transported to the surface it is taken directly for panning if it comes from alluvial soil. In the case of primary gold deposits, although not common for artisanal mining, the pieces of stone/rock dug out of pits are pounded into fine particles before panning.

Hence, strong male miners do the pitting and crushing or pounding while transporting the fine particles for panning is undertaken by children and women as well. In fact, in

Hayadima, mining is generally regarded as a male activity. In Senkelle, where quarrying is undertaken, the process involves removing the over burden and cutting stones into proper sizes as well as chiseling. In the latter case, the operators' specialization of activities is clearly seen. Thus, the following categories of operators are observed.

- i. Stone cutters
- ii. Chiselers
- iii. Labourers consisting of those who do the excavation manually, stone bearers, and loaders on vehicles.

In general, artisanal mining operations in the country are characterized as being unproductive, uncontrolled, uneconomical, lacking occupational safety, unhealthy and polluting. Informal villages spring up with little or no basic services. Digging is carried out with no knowledge about rock stability. Regulations regarding the environment, health and safety are non-existent. There is no technical assistance to identify the mineral/rock deposit, upgrade mining technologies or increase recoveries and improve health, safety, and environmental standards. Artisanal mining has proved to be a primary source of employment for job seekers from various parts of the country who are relatively disadvantaged in the labour market (e.g. unskilled, low skilled, women, disabled, etc.) The majority of these persons are engaged in occupations in which they are identified as the working poor. They are not secured and their income is not enough to maintain a family. They have shortage of capital and skill. They are exposed to shocks and unpredictable risks.

Estimates of average annual income of artisanal gold miners range from Birr 600 to Birr 3750, according to group discussions and key informants. Incomes vary mainly because of type of occupation & skill. Quarry workers in Senkelle earn between an estimated Birr 1000 and 3000 per annum. Chiselers earn slightly more income (Birr 60 to 100 per week) than stone-cutters (Birr 50 to 80 per week) Daily laborers earn only Birr 5 to 6 per day in Senkelle. Miners income, if converted to per capita income, is lower than the national average (assuming a family of five for each miner).

The Department of Trade & Industry issues licenses to traders of gold. The licenses authorize the holders to “possess, purchase, import, export, trade in or receive precious minerals.” The holder is also permitted to deal in the fabrication of gold products or production of construction stones in quarries. No reliable information is obtained regarding the real incomes of license holders, but it is obvious that they have sustainable livelihoods.

b) Service Providers

Service providers at artisanal mining sites are principally traders selling various goods and services (food, beverages, clothes, household articles, gold, medicine etc). They also provide sports and entertainment facilities like table tennis, video shows, etc. Although it is rather difficult to make realistic assessment of their incomes due to lack of reliable information it can be affirmed that the economic status ranges from the working poor like shoe shine boys, shop tenders to gold merchants who are classified in the rich category. Service providers earn per annum between Birr 720 and 4,600 in Hayadima and Senkelle.

Improvement of incomes in artisanal mining activities is rather difficult because of lack of financial resources. License holders and artisanal miners in the study areas informed the study team that there is no institution which provides credit support to the sector. The collateral required by banks and the high interest rates of private financiers are beyond their means.

Prospects of increase in productivity are also limited because of the backwardness of the technology used. Old methods of pitting by using traditional tools like holes, crow bars etc and panning can help the miners to exploit only a small proportion (about an estimated 30%) of the available gold reserve in Hayadima – Shakisso. In Senkelle, much of the stone is wasted while cutting and chiseling because of inefficient methods of

production or backward tools. In the area, there is only one grinding machine which is not operational very often.

The Ethiopian labour relations system is based on recognition of the right to organize, implying collective bargaining and agreement, joint consultation and participatory action for solving industrial conflicts or labour disputes. Freedom of association is a precondition for promoting democracy in labour relations. (Constitution of the FDRE and Proclamation No. 42/93).

However, as artisanal mining does not always involve a clear-cut employer employee relationship, labour disputes in the sector are not always governed by the labour law. Workers may be self-employed as is the case with artisanal miners in Hayadima or may be paid on piece-rate basis like in Senkelle. In Hayadima, workers operate like those in the informal sector. They operate on the fringe, if not outside, the legal and administrative framework. They do not regarded as beneficiaries of regulations concerning safety, health and other working conditions. The state of affairs has dire consequences on their well-being. "Invisibility" has severe repercussions on their working conditions, remuneration and social protection. There has been only one grassroots organizing effort according to information obtained from community group discussions. It failed because it was fragile, lacked skilful approach and the heterogeneous background and mobility of the prospective members.

In Senkelle quarries, the applicability of the law to conditions of employment and work of workers is clear. But the workers tend to resolve disputes amicably with their employers. Asked what the reason for this was, many interviewed quarry workers replied that they would prefer to create and maintain conditions which help them retain their employment. They do not want to take the risk of being fired. If they have to leave one employer they often go to a neighbor asking for a job. They said that under such circumstances, they do not want to take the risk of being rejected for the reason of being troubleshooters.

However, in both sites (Hayadima and Senkelle) artisanal miners have the option of having labour disputes settled by their respective kebele administration, the conciliation processor else go to court invoking a pertinent article in the civil code.

c) Child Labour

Child Labour is a complex problem which is deeply imbedded in socio-economic and cultural fabrics and presents a major challenge in development. Most children in most societies work in one way or another. In the Ethiopian context child labor is part and parcel of cultural upbringing and is regarded as a means of transmitting acquired skills from parent to child. However, the concern here is about children who are denied their childhood and future, working long hours for low wages and under conditions harmful to their health and to their physical and mental development. Such undesirable child labour is mostly found in agricultural and related work activities. A considerable number of children are also engaged in informal sector actor activities including artisanal mining which involves hazardous activities. In Hayadima, for instance, the working conditions in and around the pits are poor and quite dangerous. As some children are involved in pitting the lighting provided by candles used is dim and insufficient. Ventilation is not good. Miners are exposed to the caving of the hanging walls. Chiseling in the Senkelle quarries is too strenuous and hazardous. In both study areas, the main cause of child labour is poverty that forces children to work in order to augment the income of their parents. Moreover, parents keep their daughters at home to assist in household chores (washing, cooking, fetching water and fuel wood, taking care of animals, grain grinding etc.)

School children who work on artisanal mining sites face reduced potential for learning and decrease their chances for a more productive future life. Their employment is characterized by low income and poor working conditions. Some are involved in pitting although the law prohibits employment of children in mining. They are left without any protection.

d) Gender Issues

Mainstreaming women in the development process was brought in focus with the adoption of a national policy on Ethiopian women in 1993. The national population policy, the education, health, social welfare, environmental and water resource management policies further reinforced the empowerment of women.

However, women are generally excluded from certain activities in artisanal mining (e.g. pitting) because it involves hard and hazardous work. In Hayadima, for instance, their participation is mostly restricted to transporting the soil or gravel for panning as well as panning proper. Although the participation of women in quarrying is significant in several other places, they are markedly absent from the Senkelle quarries mainly because quarry work is traditionally considered in the locality to be hard and unsuitable for women. In both study areas, women are given less opportunities in socio-economic development activities and have less decision making power in community affairs than men.

e) The Market/ Prices

The market and prices differ in accordance with type of product and from area to area. Artisanal miners for instance, sell the raw gold to small traders who offer the highest price, mostly directly on the site. The small traders buy from the miners and sell to medium traders making profits of up to 5 Birr per gram. Currently one gram of gold is sold for 40-70 Birr. Medium size traders who live in neighboring towns collect the gold from small traders and take it to big traders who export it abroad, mainly to neighboring countries. Gold traders closely follow world market prices daily and set price accordingly. However miners lose because of the widespread cheating. They lose because they are not informed about world market price and sometimes they are forced to sell only to license holders.

“Construction” stones produced at Senkelle are sold for 13 Birr per cubic meter on the site and 20-25 Birr in Addis Ababa. Most of the construction stones are sent to the Addis

Ababa market (130kms away), while some go to more distant places like Nazareth (about 230kms) and Awassa (405km).

4.1.3 Institutional Support and Services

The institutional set-up for regulating the mining sector involves the Ministry of Mines (MOM) at the Federal level and the Bureaus of Mines (BOMs) at regional level. MOM has the following duties regarding the mineral sector.¹¹

- a) Formulate mineral development policy, strategy and legislation
- b) Negotiate agreements, issue licenses to exploration and development of large and small-scale mining operations.

One of the Ministry's three departments responsible for mining is the Mineral Operations Department, which is responsible for licensing, regulating and promoting mineral exploration and development activities.

The Bureaus of Mines are expected to:

- a) Cooperate with the MOM concerning the protection of mineral resources, and give the necessary support to mining and development works carried out within the region.
- b) Uncover traditional mineral exploration, register mining cooperative, give license to artisanal mining and construction materials exploitation and supervise them. This has been later revised to include all mining activities to be carried out by local investors.

The institutional support and services in the study areas leave much to be desired. There is no institution which focuses on the development of the sector. As such, no local nor

¹¹ MEDaC, Survey of the Ethiopian Economy: Review of Post-Reform Developments (1992/93-1997/98) Addis Ababa, 1999.

national budget is earmarked for services to artisanal mining or miners. The institutions at Federal and regional levels are not represented at Hayadima or Senkelle.

The Bureau of Labour and Social Affairs is the main institution responsible for providing support with respect to employment and working conditions as well as labour relations. But the Bureaus have no presence in the study areas. Local courts are involved in disputes which go beyond the conciliatory efforts of the kebele administrations.

4.1.4 Issues Arising and Recommendations

Artisanal mining can make significant contributions to rural employment and income. It can help landless and near landless farmers diversify their source of income. Artisanal mining could provide employment opportunity to urban unemployed people and retrenched workers. Nonetheless, the sector is largely neglected and ill-organized. Institutional and policy support is inadequate. No effort has been made to change backward mining technologies that often result in the loss of a good deal of the mineral along with the waste material (e.g. gold). Financial and training services are absent in the study areas. Poor health and safety conditions are serious threats to the life of miners. Gold mining is carried out in ways that degrade the environment. Miners are unorganized and do not have any bargaining power in selling their produce (buyers' market).

In order to strengthen the activities, the following measures are recommended:

- i. Due recognition should be given to artisanal mining in the framework of policy, strategy and programmes formulation.
- ii. Institutional support and services must be created in order to cater to the needs of the sector and make it more productive so that its contribution to poverty alleviation is enhanced.
- iii. Providing health, educational, and skill development facilities in artisanal mining sites helps enhance capabilities to increase income and consumption.

- iv. Promoting good governance in artisanal mining areas like any where-else in the country will undoubtedly help to get rid of gender gaps and powerlessness. It also assists in the promotion of full and productive utilization of human resources.
- v. Strengthening artisanal mining activities by taking the above and other appropriate measures also helps to overcome insecurity and risks.
- vi. In order to reduce extreme poverty a sustained economic growth is important. But high aggregate growth alone cannot be sufficient to reduce poverty and break the vicious spiral process of under development that persisted for a long time. A broad based growth with equitable income distribution is necessary. Broad based growth in the Ethiopian context entails agriculture led growth that aims at:
 - employment and rural development;
 - coherent and consistent macro and structural policies for the promotion of economic efficiency and growth;
 - setting up of conducive institutional environment for good governance and empowerment; and
 - institutional and productive capacity building.

4.2 Conserving and Improving Natural Resources

Conservation in this sense refers to making optimum use of available resources depending upon the industrial needs and changing technological requirements.

4.2.1 Policy Environment

The following policy environment is put in place with regard to natural resources.

- The conservation strategy of Ethiopia (CSE) takes a holistic view of natural, human-made and cultural resources, and their use and abuse. It seeks to integrate into a coherent whole existing and future federal and regional government

planning in all sectors that impinge on the environment, including agriculture, forestry, wildlife, fisheries, soils, water, minerals, energy, urban planning and cultural heritage conservation.

- This is an umbrella strategy which considers all sectors of human activity and enhances the capacity and effectiveness of the existing and subsequent strategies. In this respect, the CSE will play an important role in coordinating sectoral strategies.
- The environmental policy of Ethiopia (EPE) is adopted to guide all environmental related activities, which are undertaken, by the Environmental Protection Authority and other sectors.
- The Policy gives priority to the conservation and development of natural resources. Priority will be given to the conservation and development of forestry, soil, water and livestock resources.

The Key Guiding Principles are:

- Mineral resources are public property.
- The state should ensure the conservation and development of the mineral resources.
- Mining operations should be carried out in accordance with appropriate technology and sound principles of resource conservation.
- Private investment both domestic and foreign is called for in the development of mineral resources.
- Foreign exchange earnings must be acquired for export or produce import substituting products.
- Artisanal mining operations by mining cooperatives should be encouraged.
- Priorities for mining development should be directed into backward and areas of development priorities.
- Mineral development must be geared to enhancing the implementation of Economic Development priorities i.e. Agricultural led industrial strategy and

proper incentives should be granted to investors that develop minerals that contribute to the strategy.

The strategies for increasing productive capacities are to:

- a) Compile and maintain a public database on mineral production and exploration required for planning and disseminate this within the industry;
- b) Adopt mechanisms for attracting venture capital investment in mineral development;
- c) Create a simplified and efficient system for permitting investors to operate, including negotiation, licensing, land rights acquisition, dealing with other agencies, inspection and control;
- d) Strengthen the capacity of the federal and regional institutions for the survey, monitoring, regulation and administration of the planning and implementation of mining operations by communities, entrepreneur, and state agencies;
- e) Establish good working relations with existing artisanal gold miners, provide technical assistance to improve their output, support their handicraft and jeweler making, and improve their environmental management;
- f) Promote and support the local manufacture of mining equipment in particular for the small-scale and artisanal mining sectors through technical assistance and training, and through facilitating financing for mining service industries; and
- g) Provide support to women in mineral development with special practical training and technical assistance particularly in small-scale and artisanal mining;
- h) Provide technical assistance and information to private sector developers in small-scale mining such as salt extraction, lignite mining, brick making and gemstone mining;
- i) Provide technical and material assistance to artisanal miners to improve environmental protection and output efficiency;
- j) Prepare and enact specific mining environmental protection legislation;

- k) Prepare environmental management plans for areas earmarked for artisanal and small-scale mining; and
- l) To establish guarantee system for enforcing measures that should be taken by the licensee for the restoration of the land to its previous conditions or to the best improved level that the prevailing ecological conditions allow.

Main natural resources of the country can be categorized into:

- Renewable natural resources i.e. land, soil, forest, resources etc... and
- Non-renewable natural resources minerals and rocks.

a) Renewable Natural Resources

• Land

There is no land use policy both at national and regional levels. Although the Regional under study (Oromia Region) has the largest landmass as compared to other regions, it has been subjected to degradation due to erosion of topsoil, poor cultural practices, pest infestation and lack of efficient management. The destruction of cover has aggravated the problem of land degradation. Catchments erosion increases run-off which result in less rain percolating to the soil to charge the ground water aquifer system. Hence, springs dry up and perennial streams and rivers flow only during the rainy season. A rational development of the regions land resources requires a comprehensive land use policy. The systematic land use planning should be the first task to help determine appropriate types of land use/land cover for development.

The sweeping land reform of 1975 effectively did away with the exploitative feudal land tenure system that held sway, throughout the country for nearly a century. After the land reform proclamation of 1975, the second important institutional change was the introduction of the federal system of the government after the change of government in May 1991.

The Economic Policy of the country confirms that there should be no reallocation of land except to the landless and that there should be no further fragmentation of holdings. Whilst preventing the sale or mortgage of land the policy upholds the rights of peasants to lease land, to pass it on to kin to freely sell their produce, to hire labour, and to be compensated fully if expropriated. There are three elements in the policy:

- i) permitting new land allocations to the landless,
- ii) the right, which openly expressed in the pronouncements of the 11th Plenum to lease land in or out, and
- iii) the right for existing land holders to be compensated fully if land is expropriated by the state.

At both study areas, at the present level of production the population has already exceed the support capacity of the land. Moreover, landlessness is an acute problem, as a significant proportion of the population has no farmland. Landlessness is more pronounced among the young and women. At the moment those who do not have land enter into share cropping arrangement with those who have land or get employed as labourers on some ones farm.

A major problem regarding land use in Oromia (the study area) is the rapid growth of population. This has led to fragmentation of farm lands, decreases in sizes of holding and productivity, an increasing cultivation of marginal land, critical shortage of grazing land, etc.

Given the ever increasing population and intensive land use both of which exert increasing pressure on land resource, there is a need to formulate land use policy and establish an appropriate institutional machinery for its implementation.

- **Soil**

Soils in the study areas in general and Ambo Senkelle area in particularly have been subjected to erosion due to destructive exploitation. Over grazing, deforestation, use of

inappropriate farm management techniques including the use of wrong tools and implements, have contributed to erosion. These have caused floods and situation of rivers with detrimental consequences to dams and reservoirs. Although the gravity of the problem and the need for soil conservation has long since have been realized, no serious steps have been taken to mitigate the problems.

The terracing, stone building and other soil conservation practices that are already being implemented at “Ambo” level should be improved upon, if necessary, and encouraged in this area as well. In Ambo- Senkelle area, biological soil conservation measures such as grass strips, tree planting along contours would be given emphasis especially in relation to the planting of multipurpose trees along bunds.

The break-up of slope length through construction of bunds and terraces improves the moisture storage and also reduces the soil loss considerably. This would be the major impact of the soil conservation measures. A further impact of the plant roots providing anchoring effects against soil loss is yet another advantage of conservation.

The need for efficient organization and administration for agriculture need not be emphasized. In both study areas, the Oromia Bureau of Agriculture has to shoulder the responsibility for carrying out regional agricultural development policies, administrative streamlining and strengthening beings with the Bureau of Agriculture.

The Oromia Regional Agricultural Development Bureau is in charge of overall policy and strategy formulation, regulatory measures, resource mobilization, programme formulation, coordination and evaluation.

- **Forestry**

Forests and forest products play in important role in the economic of the country and Oromia in particular. They provide timber for construction, firewood for domestic use and raw materials for a host of industries such as plywood and hardboard. In addition, they affect the climate, reduce soil erosion, regulate the flow of rivers, etc.

Due to rapid population growth and the demand for food and fuel wood, and due to shifting cultivation, forest fires, urbanization, logging, etc. the forest cover of the region has been dwindling. The entire forest cover is in danger of being destroyed unless conservation measures are taken urgently.

The lack of conservation policies has aggravated the degradation and depletion of forest resources and soil erosion, causing enormous run-off. Indeed, bold measures are required to develop and conserve the forest resource of Oromia through an integrated programme of research and extension.

At present, there is no forestry conservation and development policy that encourages the population as well as private investors to engage in a rational development and exploitation of forest resources. The absence of such policies has contributed to the destruction of the region's forest resources. A major concern is that the remaining natural forest cover will be destroyed unless measures are taken. It is, therefore essential to take urgent measures to arrest the destruction of the remaining forest resources.

Hence, forest development and conservation policies need to be formulated urgently. The policy may have a two-pronged approach-conservation and rehabilitation. Conservation measures should be promoted by introducing a wide range of incentives such as the establishment of nurseries, the provision of free seedlings, food for work programmes, etc. Above all the senses of ownership of the forest resources should be developed among the community to conserve the resources on a sustainable basis.

b) Non-renewable Natural Resources

The mineral wealth is one of the most important natural assets that can significantly contribute to the region's socio-economic development in particular and the country in general.

Since mineral resources are non-renewable resources, every effort aimed at its exploitation should be optimum and sustainable. This indicates that the need for sound exploitation of the mineral/rock resources is of prime importance.

Moreover, most of these mineral resources potential have not yet fully been exploited due to a low level of technological development in the country resulting in outright wastage due to the disposal of low-grade ores as gangue materials.

The limited mining operations that exist in the country were characterized by inefficient mining practices and resulted in incurring unnecessary cost and hindering further systematic exploration and proper development planning i.e. under utilization and wastage of resources.

At Borena Zone/ Shakisso area itself it is estimated that more than 30% alluvial and deluvial gold bearing placer deposits were exploited at maximum of 60% recovery. The remaining 30 to 40 % reserves are expected to be dumped indiscriminately as wastes (A. Bekele, 1997).

The same also applies to the sandstone/dimension stone quarrying at Ambo-Senkelle and other sites, the Senkelle sandstone quarrying and processing recovery rate is estimated to be less than 40%.

The Strategies in Environmental Management and Protection

They include the following:

- a) Implement continuous programmes of education for the public and industry, environmental monitoring, and the provision of technical advice and assistance, in environmental management during mining operations;
- b) Provide technical and material assistance to artisanal miners to improve environmental protection and output efficiency;
- c) Use conditions of contract to ensure licensed mining operations prepare pre-development environmental impact studies, adopt sound environmental

- management practices during operations, and undertake appropriate mitigation and reclamation measures both during and after operations;
- d) Prepare and enact specific mining environmental protection legislation;
 - e) Prepare environmental management plans for areas earmarked for artisanal and small-scale mining; and
 - f) Assess the degradation of lands due to past mining operation and seek local community assistance and participation in restoring these lands to productive use.
 - g) To establish guarantee system for enforcing measures that should be taken by the licensee for the restoration of land to its previous conditions or to the best improved level that the prevailing ecological conditions allow.

Despite all these policy and strategy statements:

- No detail impact assessment procedures and requirements to be included in EIA have been worked out.
- No detail environment legislation to guide all environmental related activities has been prepared. The policy does not have legal sanction and there is a need for legislative instrument to implement the policy.
- No effective environmental control mechanism and therefore, most of the environmental provisions of the mining laws are not implemented. Therefore, as discovered during the field visits, mining/quarry operations are being conducted in a very dangerous method.

4.2.2 Situation in Artisanal Mining

a) Environmental Policy, Laws and Regulations

Policy

The Federal Constitution of PDRE promulgated on August 21, 1995 lays down the framework of the mineral domain and other natural resources. Article 40(3) of the Federal constitution provides that the right of ownership of the land as well as natural resources is exclusively vested in the state and the people of Ethiopia.

The overall goal of the environmental policy of Ethiopia is to promote sustainable social and economic development through the sound management and use of natural resources and the environment as a whole so as to meet the needs of the present generation without compromising the ability of future generations to meet their own needs. The key guiding principles of the Ethiopian Environmental Policy is “When a compromise between short-term economic growth and long-term environmental protection is necessary, then development activities shall minimize degrading and polluting impacts on ecological and life support systems. When working out a compromise, it is better to err on the side of caution to the extent possible as rehabilitating a degraded environment is very expensive, and bringing back a species that has gone extinct is impossible”.

Ethiopia, until recently, did not have policies that focused on the environment. Sectoral policies, put in place, failed to correctly value environmental resources.

Cognizant of this, the Environmental Policy of Ethiopia (EPE) was approved on April 2, 1997 by the Federal Government of Ethiopia. The Environmental Policy is based on the comprehensive National Conservation Strategy (NCS) documents, and has 10 sectoral and 10 cross sectoral issues, where mineral resource is considered as one sector issue. Under the Mineral Resource section, the policy provides, among others, provisions for environmental planning, environmentally sound mineral resources development, capacity building for enforcement and monitoring.

The Environmental Policy is an umbrella policy that serves as a basis for subsequent specific policies, strategies and legal frameworks. From this specific environmental legislation, environmental impact guidelines, environmental standards, etc. can emanate to guide and ensure proper operations of development projects in general and mining development in particular. This is what is lacking at present.

Legal Instruments

One of the strong elements of the Mining Proclamation, No. 52/1993, the Mining Income Tax Proclamation No. 53/1993 and the Mining Regulation No.182/1994 is their environmental considerations. The Mining Proclamation 52/1993 provides that the government may designate any area of mineral as reserved or excluded for particular mining operations and exclude any area from mining operations particularly as regards sites of historical, cultural or religious interest, public buildings, infrastructure and other installations (Article 6).

Further Article 26 of the act also provides that the licensee should promptly commence and carry out mining operations in a prudent, diligent and efficient manner, in accordance with appropriate technology and good practices generally accepted in the mining industry conduct mining operations in such a manner so as to ensure the health and safety of his agents, employees and other persons, and to minimize damage or pollution to the environment; and conduct mining operations in accordance with applicable regulations and directives.

Inspection and ensuring compliance is the responsibility of the licensing authority, in which case it is the Federal Ministry of Mines and Energy for large-scale mining operations and Regional Bureau of Water, Mines and energy for artisanal and small-scale mining operations.

The Mining Regulation No. 182/1994 provides that an application for a large scale mining license should include environmental impact assessment (5(2d)). It also requires applicants for an artisanal mining license for such other information as the licensing authority may reasonably request 5(3d). This implicitly contains environmental assessment report provisions.

The major environmental considerations of the mining Regulation No. 182/1994 are Article 29, which deals with health safety and environmental protection.

Moreover, Mining Income Tax Proclamation No. 53/1993, Article 7(3), provides that cost of restorations of land within a license area and an area covered by a base, including the cost of filling, closing or blocking generally rendering safe all installations used in mining operations are deductible costs as incentives to implement the environmental provisions specified in the laws.

Environmental Impacts

The environment is an integral part of the overall process of development. It includes the relationship and interdependencies that exist between people and natural resources. Like any other activities, mineral resources development operations have negative impacts on the physical, biological and social environment.

Ethiopia possesses vast and untapped mineral resources potential that can play an important role in the socio-economic development of the country. However, as the mineral resources in the country is not yet well developed, lack of environmentally sound technologies of mining can bring about considerable environmental damage. From the study, it appears that both past and current mineral development operations in the country in general and artisanal mining operation in Borena Zone in particular in most cases are becoming a cause for land degradation, deforestation and loss of wildlife resources, displacement of agricultural, and grazing lands and settlement areas, a source of pollution to surface and ground water, and a case for adverse health problems and hazards to workers in the mining sites and surrounding communities.

Lack of clear policies and regulations, absence of appropriate institutional arrangement to deal with environment are contributing to the unsustainable development of the resources.

The study addresses the nature and dimensions of environmental impacts (physical, biological and social) of selected mining/quarrying operations of Borena Zone (place gold) and Western Shewa (sand stone) of Oromia Regional state.

The main purposes of the study are to assess and examine environmental impact of past and current mineral resources development activities (selected mines and the quarry) in the Region with a view to streamlining future directions. In this part, the environmental effects of the artisanal mining operations of (placer and primary) gold and construction material (Senkelle Sandstone) are identified. Specific potential problems that lead to environmentally unsound mining operations in these areas are described.

Finally, this portion of the Report provides suggestions towards the mitigation of undesirable environmental impacts by stressing the need for an integrated approach to environmental management and indications of the directions of future policy, legal and institutional considerations by way of conclusion and recommendations.

b) Impact of Artisanal Mining on the Socio-economy and the Environment of Hayadima

Thousands of people migrate from every corner of the country to Borena Zone, Shakisso and its surroundings to mine gold. This population pressure and reckless mining operation caused a great problem to the surrounding resident and natural resources. Areas facing such problems are Shakisso Adola, Hagremariam, Arero and other areas in these localities. All of them are areas where the country's dwindling forest and wildlife resources are found.

According to recent study made in Adola area (Taye, 1998), areas selected for large scale mining have been illegally mined by different traditional miners; as a result all resources (time, money manpower, etc.) spent on its prospecting and exploration work became valueless. The effects of these activities are discussed below:-

i. Economic and Infrastructural Impacts

- Wastage of mineral resources as both mining and processing methods are inefficient and wasteful.

- Development of these areas become difficult to the erratic mining works (pitting, excavation, etc) affecting the economy in such a way is affecting the environment;
- Illegal mining has great influence on infrastructures especially on water supply, access roads, electric lines, etc. When such infrastructures are disrupted, other social activities also interrupted.
- Difficult to regularize, record and keep track of thereby being prone to illegal activities resulting in the loss of vital foreign exchange. According to as much as US\$24 million worth of gold each year is estimated to have been mined and sold illegally only from Adola area (Abdu 1995). The Oromia Mines, Water and Energy Bureau too shares the problems estimating this value on the higher side and also indicated the goods that are imported without tax through same border route...aggravating the double effect of the illegal mining on the economy of the country. (Amharic Report, Sene 1992).

ii. Socio-economic Problems Facing the Surrounding People

- The overcrowded/congestion of the area by gold miners in the absence of sufficient infrastructures highly increased cost of commodities and services due to the unplanned gains and expenditure habits of miners and as the result the sourcing price has become non affordable to the rural farmers and government employees.
- The fast growth of hotels and bars rather than other beneficiary institutions for the surrounding inhabitants/communities.
- Farmers are showing preference to mine gold rather than cultivate land. This shift from agriculture, added to the above problem is making the place non livable to the poor.
- Parents urge children to wash gold through the day. As a result, school enrollment has reduced since private gold mining is allowed. This trend creates illiterate and visionless generation if continued unabated. These children also practice alcoholism, prostitution, and other bad habits.

- Irrigable and grazing fields become inconvenient for development for they are being excavated, pitted and disturbed.
- Highly congested, dirty and dust settlements caused the spread of epidemic diseases such as typhoid, cholera, TB, malaria, etc.
- Spread of prostitution and related diseases such as the killer HIV/AIDS. Apart from the main center, Shakisso, other towns/villages, like Megado, Hayadima, Dawa and other small settlements are suffering from such diseases.
- The spread of the theft and other social problems.
- The non-compensated destabilization of the local community. Or
- Migration of people to the area creating social disorder with serious socio-economic effects.

iii. Disturbances on the Natural Resources

- Creation of towns in the ecologically pristine.
- Deforestation becomes inevitable since the newly settled miners/inhabitants need shelter and firewood. Unsuccessful miners may engage in lumbering and woodcutting for commercial purposes. Trees having an age span of 100 to 200 years have been cut down (Taye 1998). Deforestation also facilitates soil erosion especially in valleys and steep slope areas where mining activity is usually carried out. Deforestation has also a direct influence on wildlife resources which are also the victims of excavated area and hunted for food and their hide. Almost no wildlife, except the human friendly baboons, monkeys, and hyena, is seen in the area; some have already crossed the frontiers to flee from this massacre.
- Contamination and sedimentation of rivers, streams and ponds by the use of toxic chemicals such as mercury and their drying as result of sedimentation.

The discharge fluctuation of Awata, Mormora and Dawa rivers may indicate some changes in the climate of the area (Walli, 1995). Water quality, especially the discharge of water from alluvial gold operation, is a serious problem for those downstream users of

water for drinking. Many artisans are engaged in digging, washing and panning activities along the river of Awata, Mormora and Dawa. Inhabitants in these areas are highly affected by the low water quality.

c) Impact of Artisanal Mining on the Environments of the Senkelle Area

Artisanal operations work outside the formal section under conditions which lead frequently to significant ecological damage combined with serious health and safety hazards, wastage of non-renewable mineral resources, social tensions, etc.

Two categories of impacts are considered in the following discussion. These are: Socio-economic impacts and environmental impacts including:

- Backward mining and processing practices resulted in wastage of large and useful resources of sandstone;
- Open pits left unfilled and dangerous to mine workers, the surrounding inhabitants and their livestock. Furthermore, these pits create stagnant ponds ideal breeding ground for mosquitoes and other water borne diseases.
- Downstream pollution from the poor drained is a possibility to aggravate soil erosion.
- Modification of the surface features production of surface waste heaps, extensive pits with various dimensions and depth and dust effect with potential silicosis and respiratory problems.
- Accidents from land slide/rock fall frequent.
- Mixing up of the fertile and mature soil with stone and gravel.

Key environmental impacts of artisanal mining activities and mitigation measures are summarized below.

Key Environmental Impacts of Mineral Resources and Mitigation Measures of Artisanal Mining Activity

No.	Potential Impacts	Mitigation Measures
1	Loss of natural vegetation and wildlife, natural scenery during mining and processing	<ul style="list-style-type: none"> • Rehabilitation and reclamation measure to restore mine or quarry sits to their pre-mining status should be enforced; • Mitigation measures based on identified resources including stockpiling for use in reclamation (soils), recovering and archiving cultural and historical resources.
2	Degradation of surface waters by soil erosion from disturbed areas, waste piles, stockpiles tailings.	<ul style="list-style-type: none"> • Require control of storm water run off and prompt re-vegetation on disturbed areas. • Avoid disturbance of streams, drainages, ponds and wetlands,
3	Injury/loss of life from accidents	<ul style="list-style-type: none"> • Periodic training and continual safety reminders to all operating staff, • Ensure that all mine/quarry operators are briefed on potential hazards and necessary safety precautions, • Ensure that appropriate safety and rescue equipment is available both for pitting works and employees trained in its use.
4	Increased demands on services and facilities in local communities social and cultural conflict, concern community stability	<ul style="list-style-type: none"> • Require predevelopment, socio economic study of potentially affected communities to identify possible impacts on services, infrastructure dislocations, and conflicts • Cooperative and open working relations should be established early with local communities. • Artisanal miners should be encouraged to participate in community affairs.

d) Characteristics of Artisanal Mining Operation

Common characteristics of artisanal mining operations include:

i. Unproductive

Artisanal mining is basically a low technology activity wherein high grade/content of good must be restored to in order to attain a certain level of economic viability for the deposit as a whole or outright wastage due to the disposal of low-grade reserves as gangue materials. Exploitation is carried out without planning recovery is extremely low and estimated to be less than 30%.

ii. Uncontrolled

Since artisanal mining operators don't fulfill the legal requirements of the mining proclamation, either the Regional or Federal Government get any direct benefit. They don't pay license, rental, renewal fees and royalty. At present there is little government control on the gold trade. From Shakisso/Adola area alone, more than US\$ 24 million worth of gold is estimated to have been mined and sold illegally per year (Abdu 1995). No, detail of records and statistics is available about the daily, monthly and annual production of gold by artisanal mining means.

iii. Poor safety and health

Artisanal mining activity with its work force it is probably the most hazardous of any occupation. No safety security procedure is considered in artisanal mining activity. During pitting work the air ventilation and illumination/lighting service is insufficient. There is lack of protective measures to prevent the landslide in the pit.

Artisanal mining operators mostly live in small huts which are made from dry wood materials and the roofs are covered with grasses and plastics which can not able to protect the sun, rain or the cold during night. No proper medicines and medical facilities. They use poor quality and poorly maintained drinking and processing water causing the serious water born disease.

4.2.3 Institutional Arrangements and Services

Currently, institutional arrangement involving mining development and enforcing environmental provisions falls on two levels of institutions. The Ministry of Mines and Energy is responsible for formulation of broad policy direction, coordination, organizing and leading negotiations of mining agreements and supervising, in collaboration with Regional Bureaus, mainly large-scale mining operations.

On the other hand, Regional Bureau of Water, Mines and Energy is responsible for organizing, provision of detailed information, granting license and oversee artisanal and small scale mining development operations undertaken mainly by domestic investors. In most cases granting license for both individuals or cooperatives and follow up of renewal process is the responsibility of Zonal Department of Water, Mines and Energy. However, there is no environmental concern/organ both at the Bureau and Zonal Water, Mines and Energy Organizational setup. As a result, while granting license agreement they tend to concentrate on financial return/gain rather than environmental and socio-economic aspects. Further, no baseline information on environmental aspects of the mining site is required in the license agreement.

There are also institutions responsible for natural resources development and environmental protection such as the Environmental Protection Authority, the Regional Bureau for Agriculture and Environmental Protection, etc. In most cases these institutions operate in isolation and often have conflicting mandates. Lack of institutional synergy and integrated approach to environmental management is a major problem.

4.2.4 Issues Arising and Recommendations

The major bottlenecks for the mineral resources conservation are:

- Use of backward mining practices especially by artisanal miners.
- Low level of awareness
- Lack of regulations and enforcement mechanisms

- Lack of proper planning and only based on short-term economic gain.
- Lack of appropriate and modern technology and access to financial resources.

These problems can be alleviated through education/skill training, information, setting up of appropriate legal and institutional framework, proper planning, access to funds and application of improved mining and processing techniques.

4.3 Developing the Physical Infrastructure

4.3.1 Policy Environment

Policy measures of the construction sector encompass the policy environment regarding infrastructures. A proclamation was issued to encourage and coordinate investment. Local and foreign private investors have been allowed to participate in all areas of construction activities with priority given to local investors. State-owned construction and consulting companies have been reorganized as autonomous enterprises. The policy stated that the enterprises will subsequently be privatized.

Rural road construction and maintenance responsibilities were decentralized. Regional governments have the autonomy to decide on how to construct and manage these roads. For instance the Amhara and Oromia Regional States had constructed 1509km and 1108km of RR50 and RR30 rural roads during six years (1992/93 – 1997/98) at the cost of 300.4 million Birr and 156.9 million Birr respectively.

Rural road projects were awarded to domestic contractors to encourage them and raise the building capacity of the country. Professional engineers with a minimum of 10 years of experience are allowed to have a grade six construction license enabling them to bid in projects with a cost of up to Birr 2.5 million.

National building codes and standards (EBCS1 – EBCS11) have been issued to undertake building construction works as per the required quality and consistency. They cover the following aspects.¹²

- Issuing Proclamation which pertains to the efficiency and effective application of these codes defining powers, duties, and responsibilities;
- Issuing regulations to ensure safety from fire and health hazards related to occupancy and use of buildings;
- Structural design practices for loading, the use of concrete, steel, composite steel and concrete, utilization of timber, masonry, foundation system of buildings, earthquake resistance;
- Issuing regulations for laying down the requirements of water supply, drainage and sanitation;
- Issuing regulations for safe and efficient design of electrical installation systems for buildings;
- Issuing regulations for laying down the requirements of ventilation and air conditioning systems.

Policies pertaining to housing include that:

- The Government retains ownership of all urban land but ensures its equitable distribution of housing construction;
- The right to ownership including the right to use, rent, transfer the house, etc. is guaranteed;
- Private individuals can construct houses for rent;
- The State may sell nationalized houses but priority to buy is given to the present occupants. Compensation is paid to the previous owners whenever appropriate;

¹² MEDaC Survey of the Ethiopian Economy September 1999, Addis Ababa, Ethiopia