

**Communities and Small-Scale Mining (CASM)
CASM Secretariat
at the World Bank**

Program for
Improvements to the Profiling of
Artisanal and Small-Scale Mining Activities in Africa
and the Implementation of Baseline Surveys

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EXECUTIVE SUMMARY

1. This report presents the findings of a research program aimed at improving the profiling of artisanal and small-scale mining activities in Africa and the implementation of baseline surveys. It is based on a review of a total of 23 baseline studies on 15 African countries carried out between 1987 and 2002, including one regional report covering artisanal and small-scale mining in six SADC countries. This work has been guided by the Yaoundé vision that policies and programs directed towards the sub-sector should contribute to a sustainable reduction of poverty and improvement in livelihoods in African small-scale and artisanal mining communities by the year 2015.

2. The detailed review of past profiling work clearly confirms that the existing baseline studies vary extensively in scope, detail and depth of coverage. Many of the reports do not provide the data required for the design of policies and programs aimed at transforming the sub-sector in line with the Yaoundé vision. Moreover, the principal focus in most of the baseline studies has been on the high-value, low-bulk precious minerals gold, diamonds and gemstones. Lessons learned from the review, therefore, primarily relate to artisanal and small-scale mining of this group of minerals.

3. The comparative and gap analysis of the studies as a whole demonstrates, that although obvious commonalities exist in the methodological approach, major differences were found in the number of researchers employed and in the duration and coverage of field surveys. In addition, earlier baseline studies typically have a more legal and technical orientation, while more recent studies focus on poverty reduction and sustainable livelihoods in the community context. The analysis indicates that older reports tend to have gaps regarding social issues and the inventory of livelihood assets in artisanal and small-scale mining communities. More recent studies, by contrast, lack the detailed analysis of technical problems that need to be solved. Most of the baseline reports also lack meaningful quantitative data that can be used as benchmark indicators to monitor change. Filling these gaps will be imperative in future baseline work.

4. To improve the chances that future profiling work will deliver the information necessary, a standardized set of rules for carrying out baseline surveys is required. This standard or norm has been developed in the form of a “toolkit” for the use of researchers in future profiling work. The toolkit encompasses a checklist of critical issues and information necessary, a set of benchmark indicators against which progress in reducing poverty and strengthening livelihoods can be measured, methodological guidelines for carrying out such surveys, as well as references and links to other useful resources. The toolkit is supplemented by a set of model terms of reference designed to facilitate the implementation of future baseline studies.

5. The checklist contains issues and information that are *critical and necessary* in the sense that they can be influenced or need to be considered by decision-makers in order to achieve poverty reduction and livelihood improvement in a short to medium-term. In the detailed design of the checklist, the Sustainable Livelihoods Framework of the Department for International Development (DFID) was used to select and structure necessary information. The checklist arranges the information based on the asset pentagon into natural, human, financial, social and physical capital. In addition, the checklist is subdivided into a general issues layer, characterizing the context of the study area, and a specific issues layer, characterizing artisanal and small-scale mining within the study area.

6. The natural capital category at the general level includes information on the study area's endowment with land resources, water, flora and fauna. At the artisanal and small-scale mining level additional information on mineral resources and factors affecting access to these resources is required. The checklist item human capital encompasses data on health and education achievements of the population in general and of artisanal and small-scale miners in particular. Financial capital refers to information on income, expenditures and savings. Social capital data describe the availability of social security systems, formal associations and informal safety nets. Physical capital information characterizes assets like housing and consumer durables, as well as mining and processing equipment and related processes.

7. Benchmark indicators are quantitative data that serve as reference points to monitor change and measure progress toward the principal objectives of reducing poverty and improving livelihoods. In line with the checklist, indicators are selected to characterize the situation at the general level of the study area and at the specific level of artisanal and small-scale mining communities and operations. As part of the toolkit, a set of indicators is proposed for each of the five asset categories natural, human, financial, social and physical capital. General level indicators can be obtained from global statistical yearbooks, such as the World Development Indicators published by the World Bank, comparable indicators at the community and operations level have to be collected in field surveys.

8. The methodological guidelines review and discuss the principal methods available for field surveys, sources of secondary and primary information, data recording, compilation and reporting, and offer recommendations on how field surveys should be conducted. Recommendations for fieldwork include composing interdisciplinary teams with members from both social and natural sciences and the use of selected survey methods. In addition, teams should include local consultants who speak the local language and are familiar with local cultural norms. Important rules for data recording and reporting are to: explicitly discuss methodology employed; record sources from which information was obtained; record problems in data collection; and uniformly apply the metric system for measures and convert local currency units to US\$ values for comparability.

9. The final section of the toolkit provides a list of references and links to useful resources that can assist the researcher in carrying out baseline work. References to resources are grouped into ASM specific research and publications, data sources for benchmark indicators at the national level, as well as methodological guidelines for profiling work based on the sustainable livelihood approach. Apart from a brief indication of the type of resources available, links to website addresses (URLs) of references listed are included.

10. The model terms of reference included as a complementary item to the toolkit comprise a delineation of the objectives of the baseline study, a description of the methodological approach, an outline of the scope of work and research tasks, the expected structure and contents of the baseline report, as well as instructions related to the verification of findings. The section scope of work and research tasks essentially combines the critical issues and information necessary compiled in the checklist and the benchmark indicators into a composite list of information to be collected and reported in future baseline studies. In conformity with the checklist and the indicators, this section is structured into the asset pentagon of information related to natural, human, financial, social and physical capital. The terms of reference also instruct the researchers to verify findings in discussions with a representative group of stakeholders in a national workshop prior to completing

the final report. In addition, researchers are directed to list all sources of information to facilitate verification of findings by an independent technical audit of the baseline study in case of need.

11. Major sections of the toolkit, notably the draft checklist of critical issues and information necessary, as well as the draft benchmark indicators were discussed in the special workshop “Building a toolkit for profiling artisanal mining” at the CASM Annual General Meeting and Learning Event in September 2003 in Ghana. The workshop, which was attended by more than twenty participants from multinational agencies, government institutions, universities, and private sector firms, produced a number of useful recommendations that were incorporated into the final design of the toolkit.

12. In order to ascertain that future baseline studies will generate the diagnostic insights and produce the information necessary for the design of policies suitable to make the ASM sub-sector a more sustainable economic activity in line with the Yaoundé millennium goal, the use of the toolkit should be made mandatory for all profiling work sponsored by bilateral and multinational agencies. Moreover, the toolkit should be tested in selected ASM communities and refined on a continuing basis incorporating lessons learned in this exercise. Finally, in order to rule out the possibility of loss of baseline information, a platform for collecting, storing and sharing baseline studies related to artisanal and small-scale mining should be provided. Ideally, past and future baseline reports should be made available in an online repository for direct access and downloading to facilitate information sharing among the stakeholders within the artisanal mining community. The knowledge center at the CASM Secretariat is considered the most appropriate site for this purpose.

1. INTRODUCTION

1.1 *Background and objectives*

Artisanal and small-scale mining (ASM) form a thriving economic sector in at least 25 countries on the African continent, providing direct employment for as much as 2.5 million people, and a subsistence for more than 20 million people.^{1, 2} While artisanal mining can reduce poverty and promote sustainable livelihoods, it frequently has a number of harmful effects, including environmental degradation, child labor, and poor health and safety standards.

Multinational organizations, including the World Bank, the United Nations and the International Labour Organization, as well as a number of national institutions have sponsored diagnostic studies to obtain baseline data required for policies designed to eliminate the undesirable side-effects of ASM. Although many of these reports provide valuable insights and useful data, information presented in others is fuzzy, inaccurate or too general to be of practical value. This observation reflects limitations of baseline work due to the often informal and clandestine nature of the activity.

Recognizing the need for a better understanding of the role of ASM in Africa, the Mining Policy and Reform Division of the Oil, Gas, Mining and Chemicals Department of the World Bank, with financial support from the Austrian Consultant Trust Fund and the Communities and Small-scale Mining (CASM) Secretariat, has initiated this research program aimed at improving profiling of the sub-sector and the implementation of baseline surveys. More specifically, the objective of the program is to develop a toolkit for future profiling of artisanal and small-scale mining in Africa. The current reprofiling initiative is guided by the Yaoundé Vision Statement “that policies and programs directed towards the sub-sector will contribute to sustainably reduce poverty and improve livelihoods in African Artisanal and Small-scale Mining (ASM) communities by the year 2015 in line with the Millennium Development Goals”.³

Improving methodologies and approaches for profiling ASM is essential for several reasons. First, it will lead to a more comprehensive understanding of the social, economic, political, governance, environmental and technological aspects of the activity and its impact on poverty reduction. Second, it will provide the knowledge base and data required for designing and implementing policies and assistance programs adequate to reduce poverty and achieve social, economic and environmental sustainability. And finally, it will permit to identify a set of indicators suitable for monitoring and measuring progress toward these developmental objectives over time in different regions and countries.

¹ International Labour Organization. Social and labour issues in small-scale mines. Geneva, 1999.

² United Nations Department for Economic and Social Affairs (UNDESA). Poverty Eradication & Sustainable Livelihoods: Focusing on Artisanal Mining Communities. SPPD Project RAF/99/023. Final Report. New York – Geneva, June 2003.

³ United Nations Economic Commission for Africa and United Nations Department for Economic and Social Affairs. Seminar on Artisanal & Small-scale Mining in Africa: Identifying Best Practices & Building the Sustainable Livelihoods of Communities. Recommendations “Yaoundé Vision Statement”. Yaoundé, Cameroon. November 2002.

1.2 Methodological approach

Methodologically, this research effort has been conducted as a desk study using past baseline reports on artisanal and small-scale mining activities in African countries as the primary source of information. Principal findings from the review of existing profiling studies have provided the building blocks for the drafting of the toolkit. As indicated, both the analytical and the design phase of the program have been framed by the Yaoundé objectives to sustainably reduce poverty in ASM communities.

In the World Development Report 1990, the World Bank defines poverty as the inability to attain a minimal standard of living.⁴ The most recent World Bank report focusing on the subject, defines poverty as a “pronounced deprivation in well-being”.⁵ In the broader view, poverty is not confined to material deprivation, which can be adequately captured by measuring income and consumption. It encompasses all aspects affecting well-being including health, education, vulnerability and exposure to risk. It also includes being heard and access to power to affect (political) decisions that directly or indirectly affect one’s livelihood. Because of its focus on poverty and livelihoods, the Sustainable Livelihoods Framework of the Department for International Development (DFID) has been used both in assessing past baseline studies and in drafting a toolkit for future profiling work.⁶

Preliminary results of this research program were presented at the CASM Annual General Meeting and Learning Event held September 7-10, 2003 in Elmina, Ghana. At the same event a workshop entitled “Building a toolkit for profiling artisanal mining” was conducted. During this workshop, the consulting team presented the checklist of critical issues and information necessary as well as the benchmark indicators required to monitor progress to a multi-national audience. The more than 20 participants came from government agencies, international organizations, universities and consulting firms. The workshop provided an excellent opportunity for a reality check of major toolkit components. The final toolkit incorporates recommendations from workshop participants.

In correspondence with the scope of work for this assignment, the report is structured in five major sections. The first section following this introduction contains an inventory of past baseline work undertaken in African countries to profile artisanal and small-scale mining. The second section presents the principal results of a review of these profiling studies using a common analytical framework. It is followed by a comparative and gap analysis of the studies as a whole, highlighting differences and commonalities of approach and identifying any apparent gaps or omissions. The fourth and main section is devoted to the preliminary drafting of a toolkit for carrying out future baseline studies which would reflect the Yaoundé objectives. This toolkit includes a checklist of critical issues and information necessary, a set of benchmark indicators, and methodological guidelines for profiling work. It is complemented by a set of model terms of reference designed to facilitate future baseline work, presented in the final section of the report.

⁴ The World Bank. Poverty. World Development Report 1990. Oxford University Press.

⁵ The World Bank. Attacking Poverty. World Development Report 2000/2001.

⁶ DFID Department for International Development. Sustainable Livelihoods Guidance Sheets. http://www.livelihoods.org/info/guidance_sheets_rtf/Sect2.rtf | download 08/2003.

2. INVENTORY OF PAST WORKS

The CASM secretariat and the consulting team compiled an inventory of past baseline studies in countries of Africa south of the Sahara, which were specifically undertaken to profile or define the characteristics of artisanal and small-scale mining. This inventory is presented in tabular format and subdivided into studies on Anglophone African countries and Mozambique, and studies conducted on Francophone African countries. Baseline reports about Anglophone Africa and Mozambique are presented in ANNEX I.1., while those about Francophone Africa are listed in ANNEX I.2.

In both cases, known profiling studies are documented by countries arranged in alphabetical order. If more than one study exists for any one country, reports are presented in an ascending chronological sequence. Where reports consist of more than one volume, all volumes are included in the inventory. The following information is provided for each individual profiling study: country, title, number of pages, prepared for, prepared by, and date of study.

As shown in Table 2.1., the inventory contains a total of 23 baseline reports on 15 African countries completed between 1987 and 2002, including one regional report covering ASM in the SADC countries Malawi, Mozambique, Tanzania, South Africa, Zambia and Zimbabwe.

Table 2.1.: Inventory of baseline studies

Country	No. of studies	Year study completed	Minerals covered d/
Burkina Faso	2	2001a	Gold
		2001b	Gold
Cameroon	1	1998	Gold
Congo	1	2002	Gold
Ethiopia	1	2002	Gold, building materials
Ghana	3	1987	Gold, diamonds.
		2001	Gold, diamonds.
		2002	Gold, diamonds.
Guinee	1	2002	Gold, diamonds
Madagascar a/	1	2000/2001	Gold, gemstones, industrial minerals (quartz)
Malawi b/	1	2001	Gemstones, limestone, sand & gravel, clay, coal.
Mali	2	2002	Gold, semi-precious minerals (diamonds, garnets)
Mozambique	2	2000	Gold, gemstones
		2001 b/	Gold, gemstones, (clay, aggregate, heavy mineral sands)
Niger c/	1	1999	Iron, copper, tin, gypsum, salt, trona, construction materials
South Africa b/	1	2001	Diamonds, gold, (kaolin, clay, coal).
Tanzania	3	1993	Gemstones, gold, (limestone, salt, gypsum).
		1996	Gold, gemstones, diamonds, (salt, sand & gravel, stone aggregate, limestone, gypsum, coal).
Zambia	2	1997	Gold, diamonds, gemstones.
		2001 b/	Gemstones, (stone aggregate).
Zimbabwe b/	1	2002	Gemstones
		2001	Gold, (chromite, gemstones).
Countries: 15	Studies: 23	Time frame: 1987-2002	

a/ Includes four related reports.

b/ Chapter in MMSD Study on SADC Region.

c/ Focused on child labor in ASM

d/ Minerals in parenthesis are only marginally addressed in the study.

While the inventory includes all African countries with major ASM activities, individual studies vary widely in terms of scope, detail and depth of coverage. The most comprehensive baseline information over an extended period of time has been collected on Ghana and Tanzania, the two leading ASM countries on the continent. Others, including Zimbabwe where important ASM activities do occur, are only covered in the form of a chapter in a regional study.

From Table 2.1. it is also obvious that the high-value, low-bulk precious minerals gold, diamonds and colored gemstones have been the principal focus of most baseline reports. By contrast, the low-value, high-bulk commodities, including construction materials, industrial minerals and coal, have received much less attention. Therefore, it has to be noted that in view of the general focus on precious minerals, lessons learned from the review of the baseline reports relate principally to the high-value, low-bulk group of minerals.

One reason for this preferential treatment in baseline work is that precious minerals are the favorite targets of artisanal and small-scale mining in Africa, attracting by far the largest fraction of people involved in the activity.

High-value, low-bulk minerals offer distinct advantages to the artisanal miner⁷. Thanks to the low product volume and the high unit value, precious mineral production can be easily marketed. Because of these attributes, bringing production to markets does not require an extensive transportation system and transportation costs are negligible even for long distances. In many cases, precious minerals can be sold to traders who collect commodities directly from the mining sites, relieving the miners of the chore of product marketing. Moreover, precious minerals frequently occur in alluvial deposits that can be easily mined and processed. Such operations require little in terms of equipment and skills and can therefore be started with a minimum of training and financial means. In view of the low barriers to entry, precious minerals will continue to be the preferred choice for artisanal miners wherever geology provides favorable opportunities. The fact that precious minerals have been mined by artisanal miners since historical times in many countries, including Burkina Faso, Ghana, Mali and Mozambique, is an indication that this activity can provide income and sustainable livelihoods for many generations.

High-bulk, low-value commodities, such as construction materials, on the other hand, are highly transport-sensitive and require an efficient transport infrastructure between mine and market. Due to the low unit price, the competitive market radius is comparatively small, rarely exceeding 50 km for stone aggregate and sand and gravel. Limited demand within the small economic market radius and poor transport infrastructure frequently poses constraints for small operators in developing countries. Hard rock mines and industrial minerals deposits usually also require more sophisticated mining and processing techniques which often are beyond the skills and financial capacity of the

⁷ A good example is the amethyst mining in Zambia. The unit value of amethysts from the same mine may range from US\$ 0.20 up to US\$ 1,000 per kg. Artisanal and illegal miners are only focusing on the high-grade material, ignoring the medium and low-grade in their mines. In the same area on the same belts, the better developed mines are, the more they mine and sell the higher-bulk low grades. Reasons for these different strategies are:

- Easier marketing for high-price low-bulk material, illegal marketing is possible, quicker money returns (quick cash), local buyers.
- Higher investment costs and improved technical skills for high-bulk mining, processing and transport.
- High bulk material can only be sold in contracts which requires a guaranteed constant quality and quantity supply

artisanal and small-scale miner. Moreover, demand for industrial minerals in developing countries is generally limited as long as the manufacturing sector is not well developed. In view of these constraints, high-bulk, low-value minerals are usually less attractive for the small operator.

Under favorable circumstances, however, also this group of commodities can offer attractive options for artisanal and small-scale mining. This is particularly true for construction materials, such as sand and gravel or brick clay for which barriers to entry in terms of skills and capital requirements are moderate. Urban centers with growing populations provide long-term markets for small-scale mining operations extracting construction minerals in the vicinity, contributing to employment, poverty alleviation and sustainable livelihoods in related communities.

Another possible reason for the preferential treatment of high-value, low-bulk minerals in baseline work – and that applies not only to Africa – may be a subjective preference of researchers and contracting agencies, related to the traditional perception of what is “mining”.

While construction material for large urban areas might be mainly provided by industrial operations, construction in rural areas does not provide an attractive market (if any) for mechanized operations. Due to the sensitivity of low-value high-bulk material to transportation cost, construction material in rural areas can only be provided by local small-scale mining operations. In a final instance, even the home-made adobe brick involves “mining” activity: prospecting, extracting and processing the clay. Nevertheless, these activities are rarely considered “mining”, as they occur all over the country and not in easily targetable “ASM mining regions”. Data about this mining sub-sector might rather be found in baseline studies related to the construction sector.

3. REVIEW OF BASELINE STUDIES

3.1 *Framework for review*

A common framework was applied to review past ASM baseline surveys and profiling studies. This framework provides a uniform analytical structure for recording key aspects documented in the reviewed studies, which facilitates comparison and interpretation of results across countries. Reviews focused on (i) the objectives of the study, (ii) methodologies and survey techniques employed for data collection and analysis, (iii) key parameters or characteristics actually documented and evaluated, (iv) any parameters identified as indicators against which change could be measured, (v) limitations identified by the original researchers related to data collection, scope and extent of coverage and analysis of data, (vi) recommendations made by original researchers for further evaluation, data collection and/or data analysis, and (vii) any new, unique or significant attributes of artisanal mining activity identified as a result of the study.

Individual study reviews are documented in ANNEX II by countries arranged in alphabetical order. In addition to the country designation, the year of study completion is used as an identifier.

3.2 *Principal findings*

3.2.1 Objectives and Methods Applied

The review suggests that earlier profiling studies were more focused on legal, institutional and technical aspects of ASM. The main study objectives were to search for ways to regularize the activity and to introduce more appropriate mining and processing techniques (Ghana, 1987; Tanzania, 1993).

More recent profiling studies have a more socio-economic orientation, analyzing poverty, vulnerability and sustainable livelihoods in ASM communities (Burkina Faso, 2001; Ethiopia, 2002; Ghana, 2002; Guinea, 2002; Mali, 2002). All reports had as an objective to provide information required to improve the contribution of ASM to the respective national economies through regularization and the elimination of undesirable side-effects.

Methodologically, virtually all major baseline studies combine desk work and field surveys, though some of the shorter reports almost exclusively use secondary data. Primary data collected during field surveys consisted of observations in mines and communities, and stakeholder interviews. Interviews were conducted with artisanal miners, representatives of miners associations, community leaders, mining authorities and government officials. In some cases, material samples were taken to obtain data on health or technical performance.

3.2.2 Key characteristics documented

The various baseline reports come to similar conclusions regarding the key characteristics of ASM activities and communities documented in the different countries.

In spite of efforts to regularize the activity, ASM is still largely an informal and often clandestine activity on the African continent. It is estimated that 80 % to 90 % of small-scale mining activities in

the SADC Region are informal.⁸ Similar estimates have been made for the share of informal miners in Ghana.⁹ Various causes for the persistence of illegal activities have been identified, including inadequate prices offered by government buying agencies, unrealistic foreign exchange rates, bureaucratic licensing procedures and the dependence of artisanal miners on private dealers providing advance payments.

In the technical field, low levels of mechanization and “inadequate” mining and processing practices resulting in poor productivity and mineral recovery are documented in all ASM districts. Overall recovery rates in gold mining are frequently well below 50 % of the in-situ values (e.g. Ghana, 1987; Mozambique, 2001). Reasons stated for the use of “inappropriate” techniques are a combination of lack of investment capital and know-how.¹⁰

Artisanal mining is considered an important economic activity providing employment for a large number of people in rural areas (Ghana, 2001; Tanzania, 1997; Zimbabwe, 2001). Moreover, incomes from mining are usually higher than in other jobs, notably in agriculture (Cameroun, 1998; Ghana, 2001; Madagascar, 2000/2001; Tanzania, 1993; Tanzania, 1996). External shocks, such as economic structural adjustment programs, the downsizing of large mining operations, or severe droughts affecting agricultural yields, have in some cases been identified as causes for increasing ASM activities (Burkina Faso, 2001; Mozambique, 2001; Zimbabwe, 2001).

Significant numbers of women and children are involved in ASM activities, mainly in mineral processing, as well as in peripheral service activities such as providing food and water. Estimates on women participation range from 25 % (Tanzania, 1996) to 50 % (Ghana, 2001; Zimbabwe, 2001). In Ethiopia it is considered normal that children are helping their parents in mining and agriculture as part of their upbringing (Ethiopia, 2002). Estimates of children participation are few and vary widely from 5 % (Burkina Faso, 2001) to almost 50 % (Niger, 1999).

In most baseline reports ASM activities are characterized as being environmentally destructive. Environmental damage includes deforestation, abandoned pits and trenches, as well as mercury contamination of people and the ecosystem. Only in a few cases quantitative data are provided. For example, it is estimated that in Ghana 15,000 hectares of land are potentially affected (Ghana, 2001), while in Tanzania some 16,000 hectares (Tanzania, 1996) reportedly have been destroyed. In relation to the total land area of the countries, the shares of land affected by ASM are very small, amounting to 0.06 % in the case of Ghana and 0.02 % in the case of Tanzania.

Health, sanitation and safety conditions are generally poor in ASM communities, but again only in a few cases quantitative data are presented (Mali, 2002). Malaria, respiratory infections, HIV and sexually transmitted diseases are frequently observed in mining communities, in addition to mining specific hazards such as accidents due to rock-falls and health problems due to mercury poisoning.

⁸ Drechsler, B. (Editor). Small-scale mining and Sustainable Development in the SADC Region. MMSD/IIED, August 2001.

⁹ Hilson, G. A Contextual Review of the Ghanaian Small-scale Mining Industry. MMSD/IIED, September 2001.

¹⁰ Techniques with low levels of mechanization and recovery rates are frequently characterized as “inadequate” or “inappropriate”, without a thorough reality-check of feasible alternatives under given constraints and limitations (e.g. lack of capital).

In baseline reports that investigate institutional aspects, mining authorities are usually reported to be unable to effectively support and control the activity due to inadequate human and operational resources, notably transport vehicles (Ghana, 1987; Malawi, 2001; Mozambique, 2001; Tanzania, 1993; Tanzania, 1996; Tanzania, 1997; Zambia, 2001; Zimbabwe, 2001). The inadequate institutional framework is largely held responsible for the negative side-effects of ASM activities, particularly the environmental damage and the poor health and safety record.

With regard to vulnerability which is addressed in several of the more recent baseline studies, two different observations are reported. One is that artisanal miners and communities depending on the activity are highly vulnerable to income variability and health and safety problems (Ghana, 2002; Guinea, 2002; Madagascar 2000/2001). Vulnerability is aggravated by low levels of formal education among miners, a lack of assets, and poor access to credit. The other is that ASM can apparently reduce the vulnerability of rural communities as it helps to overcome difficult times, such as after poor harvests due to droughts (Burkina Faso, 1991; Mali, 2001).

3.2.3 Limitations encountered

Several factors have been identified as barriers to collecting and analyzing reliable data in baseline work. One is the seasonal, transient and informal nature of the ASM sub-sector which is the main reason why the activity is not or poorly documented in national statistics (Burkina Faso, 1991; Madagascar, 2000/2001; Mali, 2001; Zambia, 2002). Another factor mentioned is that, because of the clandestine character of the activity, researchers asking questions during field surveys may be met with suspicion (Cameroun, 1998). Finally, in some instances resources available for baseline work have been insufficient, limiting the scope of field surveys and related primary data collection (Ethiopia, 2002).

A number of researchers directly or implicitly recommend further data collection and analysis, notably on causes and extent of child labor in ASM (Niger, 1999; Tanzania, 1996 and 1997), on female participation and the role of women (Burkina Faso, 2001; Tanzania, 1997; Zimbabwe, 2001;), on health hazards (Tanzania, 1996), on environmental effects and restoration requirements (Burkina Faso, 2001; Guinea, 2002), on the benefits of partnerships with large mining companies (Congo, 2002), and on other ASM characteristics (Burkina Faso, 2001; Cameroun, 1998; Ethiopia, 2002; Mozambique, 2000 and 2001).

The baseline studies reviewed do not explicitly identify benchmark indicators required to monitor change in ASM communities. Nevertheless, the different country reports contain varying amounts of quantitative data on key parameters and characteristics of the sub-sector that can be used for this purpose. Examples include data on the estimated number of people active in ASM, on women participation, annual production, average income and ownership of assets, productivity, mineral recovery, and land area affected. The lack of quantitative data on the activity in some of the baseline reports is apparently a result of the limitations encountered in the course of profiling, discussed above.

3.3 Overview of country reports

3.3.1 Burkina Faso

Two studies on Burkina Faso have been reviewed, referred to as Burkina Faso 2001a (in French, ANNEX II.1.1.) and Burkina Faso 2001b (in English, ANNEX II.1.2.). These studies differ much in coverage. Burkina Faso 2001b is general and descriptive. Over half of the report is dedicated to a description of historic and current institutional and legal issues, including a description of the government agencies involved, production figures, permits, and titling. It provides a macroeconomic context by evaluating how exchange rates, overseas finance, customs regulations, and other national and international economic factors affect ASM. In its second section, Burkina Faso 2001b characterizes ASM and presents some statistics on production and earnings.

Burkina Faso 2001a provides a more detailed and micro-scale perspective. It presents quantitative information of estimated earnings and living conditions of people in different mining-related professions (incl. crushers, title holders, restaurant owners) in four different sites. The study's main focus is health in a socio-cultural context. The researchers quantitatively and qualitatively analyze miners' awareness of HIV/AIDS transmission and other ASM-related health, safety, and sanitation rather than merely stating the presence of certain hazards and illnesses.

3.3.2 Cameroon

Cameroon 1998 is a socioeconomic baseline study that discusses ASM within a local/regional economic and developmental context (ANNEX II.2.). It describes socioeconomic conditions, health and sanitation, and political/institutional structures in ASM communities and provides quantitative data for a large number of possible indicators of change. These parameters include the ethnic composition of the ASM community, revenues of different participants in ASM (women, men), prices of food and materials, nutrition, and sanitary indicators. Even though environmental conditions are mentioned in the study objectives, they are only marginally discussed. Comprehension of the possible role for ASM in poverty reduction requires further investigation of these environmental issues, as well as of the relation between migrant and local people working at ASM sites; of the government position vis-à-vis artisanal mining; and of the relation of miners with government services and agents.

The researchers were met with suspicion from both miners and government officials, who hesitated to provide access to even public information. The quality of field data improved after several days in the ASM community as the miners became familiar with the research team.

3.3.3 Congo

The objective of Congo 2002 is to provide baseline data for policies aimed at improving the contribution of ASM to sustainable livelihoods in rural areas (ANNEX II.3.). However, the study lacks quantitative and qualitative data that can be used as indicators of change. Much of the data provided does not refer directly to economic and livelihood aspects (incl. health) of current ASM, but instead describes past gold production and mining laws, as well as the natural environment (geology and geography). Congo 2002 focuses in on the organization of ASM at one particular site, Elogo, where artisanal miners have formed a partnership with a larger association called the Society

for Gold Mines and Quarries (MAC-CONGO). Informality and illegality is reduced as miners sell their gold to the company, and in return receive technical assistance that should improve their production. Because no current production figures are stated for either the miners or others working at the ASM sites, it will not be possible to evaluate whether this partnership indeed has a positive effect on community well-being.

3.3.4 Ethiopia

The study on Ethiopia (Annex II.4.) provides a comprehensive overview of the artisanal mining sector in the country, with the objective to “develop policy options and practices towards sustainable livelihoods of artisanal mining communities in Ethiopia”. The study gives a detailed background with macro-economic indicators for the country and the mining sector and focuses further on two case studies, including the Hayadima area (gold) and the Senkelle area (building materials). The researchers recognize that there are more than 100 maybe similar important mining areas in the country and they allow the question to what extent the collected data is representative for the sector or the country as a whole..

Following the sustainable livelihood approach, the study provides a detailed problem analysis (on national as well as on local level) which is followed by detailed recommendations for each of the issues. A national workshop which included most important stakeholders from the sector was held after presentation of the draft report. The workshop report was used for closing gaps in the final report. The study is using poverty and poverty reduction as main indicators. Its general message is that despite the enormous potential, the artisanal mining sector in Ethiopia has failed till now to contribute towards improved sustainable livelihoods for the mining communities.

3.3.5 Ghana

Three studies on Ghana have been reviewed, referred to as Ghana 1987 (ANNEX II.5.1.), Ghana 2001 (ANNEX II.5.2.) and Ghana 2002 (ANNEX II.5.3.). Ghana 1987 was conducted with the purpose to recommend institutional and operational measures to improve the contribution of small-scale gold and diamond mining to Ghana’s economy.¹¹ The study focuses on legal, institutional and technical aspects of the activity but – contrary to other profiling reports - does not investigate gender, health, safety and environmental issues. Besides describing operational problems, the baseline survey deals with the causes and extent of illegal mining activities. In addition, Ghana 1987 provides a major section on measures required for the regulation of the small scale mining sector, a worldwide review of legislation and institutional measures adopted to encourage the small scale miner, as well as useful material on equipment suitable for small-scale mining operations.

The objective of Ghana 2001 is to provide a detailed overview of the small-scale mining industry based on a literature review supplemented by an unspecified number of interviews and mine visits. The objective of Ghana 2002 is to identify key assets and areas of vulnerability of ASM communities, based on livelihood analysis of social groups, including field surveys and interviews covering three communities.

¹¹ It is interesting to note that Ghana 1987 does not use the term artisanal mining which is extensively used in later baseline studies to describe informal non-mechanized mining activities carried out by individuals and ad-hoc groups.

These two recent studies provide substantial information for characterizing ASM activities and essentially come to similar conclusions regarding the contributions and problems of the activity. Notably, issues like land right and titling, technical and economic aspects, environmental degradation and health, gender and child labor are addressed. In specific areas, however, there are considerable differences in data reported, illustrating the difficulties in obtaining reliable information on the sub-sector. Ghana 2002, for example, states that 10 % of the labor force are women, while Ghana 2001 reports that 15 % of the legal and 50 % of the illegal workforce are women.

With the exception of Ghana 1987 which identifies artificial exchange rates as a major cause of illegal marketing, the reports contain little information necessary for understanding the effects of particular macro policies, such as exchange rates, fiscal and budgetary policies on the sub-sector, for describing the flow of resources across sectors, and the economic multiplier effects of the activity. Similarly, the studies do not present specific benchmarking indicators nor do they specifically mention limitations related to data collection and analysis. Ghana 2002 makes recommendations for further data collection and evaluation required for understanding the state of poverty, assessing the level of economic activity, land-use conflicts and the roles of institutions in ASM communities.

3.3.6 Guinea

In an effort to mitigate negative impacts of ASM, the Guinea government intends to both dedicate a share of mining taxes to the development of ASM communities, and develop alternative economic activities in mining zones. Guinea 2002 (ANNEX II.6.) presents baseline data on artisanal and small-scale gold and diamond mining to aid such public policy.

The researchers visited villages and mines, using conventional social science methods (focus groups, interviews) and participatory methods. Rather than characterizing mining and miners, the study provides a broader description of the ASM villages. Guinea 2002 records in great detail social, institutional, economic, political, and environmental aspects of research villages. Many of these parameters are quantitative and can serve as indicators of change over time. Other data are notoriously lacking, including estimates of incomes obtained from ASM-related professions and other economic activities, information on titling, and environmental indicators. The report finds most artisanal mining communities in need of financial aid and comments on the poor access to credit and other resources for development.

Unique positive features of this report include:

- A detailed table listing objectives, content, methods, and duration of each research stage, which allows the reader to validate the results and replicate data collection methods in the same or other ASM sites.
- Explicit acknowledgement of the diversity within and among ASM communities. In some research villages ASM had contributed little to improvement of overall well-being, while in other villages miners associations have sponsored community development projects.

3.3.7 Madagascar

The material reviewed on Madagascar (ANNEX II.7.) includes four related reports compiled in the course of the ITC/Projekt-Consult project as a base for the „Projet d'Assistance Technique aux Petits Exploitants Miniers (PATPEM)“. The studies were carried out to assist the Department of

Energy and Mines of Madagascar to develop a more formalized small-scale mining sector. The reports have been compiled as desk studies, supported by short fieldtrips and fact-finding missions as well as inputs from other stakeholders.

The studies provide data on earnings and living costs in ASM as well as detailed statistical information on the participation of children in the sub-sector. On the other hand little information and no quantitative data are provided on technical, environmental, health and safety or community aspects. In view of the limited coverage excluding a number of essential areas, the combined reports do not represent a full baseline study.

3.3.8 Malawi

Malawi 2001 (ANNEX II.8.) is a country chapter in the MMSD-study “Small-scale Mining and Sustainable Development within the SADC Region”, carried out with the purpose to characterize the nature and extent of small-scale mining activities in terms of economic, social and environmental impacts and their role within rural sustainable livelihood strategies. The report is based entirely on secondary information obtained by interviewing the technical staff of the mining authorities and by reviewing relevant technical reports.

The study provides data on employment in and output of small-scale mining, but does not contain quantitative information on other aspects of the activity, notably regarding environmental effects, health and safety or livelihood indicators. A unique aspect documented in the report is that women involved in the mining of gemstones, limestone and salt are organized in the Malawi Association of Women Miners. In view of the limited scope and data provided, the report cannot be considered a full profiling study.

3.3.9 Mali

The two studies about ASM in Mali, the MMSD commissioned Mali 2001(ANNEX II.9.1.) and the UNDP funded Mali 2002 (ANNEX II.9.2.), differ substantially in approach and content. Mali 2001 provides a generalized overview based on secondary data. It presents few indicators that allow policy makers to either compare different mining sites or to track changes in mining communities over time. By contrast, Mali 2002 applies a “sustainable livelihoods approach” (AMEP) to collect systematic qualitative and quantitative data on artisanal gold mining in a context of shocks, vulnerability, and sustainable development. The detailed explanation of methodology and inclusion of the questionnaires allows other researchers to replicate the study and validate the results. Numeric data are provided for a series of indicators of change, including the frequency of a number of diseases and accidents, demographics, land ownership, and revenues from gold mining. Data presentation, however, is less than optimal. For example, survey results are presented without reference to sample size, and a table with frequencies of work accidents and illnesses does not specify what the listed percentages refer to.

Both Mali 2001 and Mali 2002 criticize past policy efforts to develop the small-scale gold mining sector for giving priority to technical issues over social and economic needs of the population. Both positively review recent initiatives, involving liaisons between ASM and large companies (Mali 2001) and a public program to promote more sustainable small-scale gold mining. In this light it is surprising that Mali 2001 still focuses primarily on technical and legal conditions in ASM. We do

not know to what extent mining allows communities and families to improve their living conditions, or what they perceive to be their severest problems or barriers to advancement.

An important contribution of Mali 2002 is its measurement of indicators of social, human, physical, and financial capital. The results expose similarities and differences within and between mining communities. For example, in one community all respondents farmed in addition to mining while in another community only a minority of miners practiced agriculture. This and other findings suggest that nation-wide baseline studies should be aware of, and attempt to capture, the diversity in mining experiences.

3.3.10 Mozambique

Two reports have been reviewed on ASM in Mozambique. Mozambique 2000 (ANNEX II.10.1.) provides very comprehensive baseline-data on the country's ASM-sector. The survey was conducted in four provinces, namely Manica, Tete, Nampula and Niassa, intermittently between April and September, 2000. These provinces were selected because of the intensity and long tradition of artisanal mining.

The research methods used during the survey included questionnaires, observation, focus group discussion, in-depth personal interviews and review of health records. These research methods were used because of the necessity of understanding and diagnosing the needs of artisanal miners within the perspective of development of the mining community as a whole. Teachers from nearby schools, health staff, cultural and religious leaders were among the key informants in the various communities, who participated in the survey.

The target groups were gold (gemstone) miners, community members, community leaders, mineral traders, storeowners or informal sellers (owners of tuck shops or "*barracas*"). Focus group discussions were conducted with men, women and children at the mining sites and in some communities. Due to logistical problems and time factors, focus groups discussions did not cover all groups nor all provinces. The sample size used for the questionnaires was 10% of total population of all target groups. Where population were not known, estimates were used.

The objectives of the survey were to:

- 1 Describe and assess the organization and relations of production, processing and marketing in artisanal mining;
- 2 Highlight the constraints and problems affecting the sector's development;
- 3 Assess the impacts of artisanal mining on the livelihood of the local people, local economy, environment and health;
- 4 Make recommendations on how to manage, develop and regulate the sector.

The study covered information on geology and mineralization, socio-economics, production, relations of production, marketing, and distribution of gold and gemstones, environmental and health issues. The study looked at the potential and constraints to the development of the artisanal mining community as well as the environmental, socio-economic and health impacts.

The second report, Mozambique 2001 (ANNEX II.10.2.) is a country chapter in the MMSD-study "Small-scale Mining and Sustainable Development within the SADC Region", carried out to determine how ASM can best contribute to regional sustainable development and by learning more about the nature of the activity to identify approaches and strategies to be used in dealing with the

sector. The study was conducted as a literature review with limited fieldwork in one ASM area, including role player interviews and interviews with officials of the mining authorities.

The report is well structured and provides much detailed information profiling the ASM activities, including observations on mining and processing methods, organizational and institutional arrangements and data on employment, income, gender and child labor, marketing, as well as on legal aspects. An interesting observation is that cultural barriers impede the involvement of women and the introduction of mechanized equipment in some areas, based on the belief that women attract bad spirits and the noise caused by machinery may disturb spirits. The study also provides some general conclusions and guidelines for the transition of ASM activities to sustainable development.

3.3.11 Niger

While focusing specifically on child labor, Niger 1999 (ANNEX II.11.) provides a broad overview of ASM in Niger. The study describes production processes, the mining work force, and the economic context of ASM of four different minerals - trona, salt, gypsum and gold. Quantitative estimates are given for the mining population, specified to sex and age groups, active in different stages of mineral extraction and processing. It is estimated that ASM (mines and quarries) employs several hundred thousand workers including about 250,000 children¹². All four mining activities surveyed employ a high proportion of children (usually over 50%) and involve significant risks of accidents and illnesses, particularly to children. The report labels child labor *intolerable* especially in gold mining, where young children work in extremely hazardous and physically strenuous conditions, and are involved in prostitution and drugs.

The study calls for international organizations to support the State, NGOs, and communities in efforts aimed at improving working conditions in ASM. Of particular urgency is to relieve the suffering of children and to offer them a better future, especially in and around gold mines. It also recommends assistance to miners in the formation of cooperatives or associations, and in the adoption of more appropriate technologies. Such measures should fall into broader policy efforts aimed at poverty alleviation and regulation (incl. safety standards) of ASM.

3.3.12 South Africa

South Africa 2001 (ANNEX II.12.) is a country chapter in the MMSD-study “Small-scale Mining and Sustainable Development within the SADC Region”, carried out with the purpose to characterize the nature and extent of small-scale mining activities in terms of economic, social and environmental impacts and their role within rural sustainable livelihood strategies. The report does not explain the methodology applied, but apparently is the result of a desk study.

The study provides some data on employment in and revenue from small-scale mining as a percentage of total industry figures (without stating sources), but does not contain quantitative information on other aspects of the activity, notably regarding gender, environmental effects, health and safety or livelihood indicators. A unique aspect brought up in the report, although without any details on the evidence, is that in some cases artisanal miners are used as fronts for money laundering. In view of the limited scope and data provided, the report cannot be considered a full profiling study.

¹² The study defines as a ‘child’ everyone under the age of 18.

3.3.13 Tanzania

Three studies on ASM in Tanzania were reviewed. Tanzania 1993 (ANNEX II.13.1.) was conducted with the objective to identify equipment and methods to improve ASM performance. Tanzania 1996 (ANNEX II.13.2.) was carried out to provide reliable quantitative information on the current position and performance of ASM activities in the country. And Tanzania 1997 (ANNEX II.13.3.) was prepared to identify technological problems facing artisanal mining and to explore socio-economic aspects related to the activity. All three studies, notably the first two reports, are based on extensive field surveys, including numerous interviews and mine visits, and supplemented by literature reviews.

The studies contain much detailed information profiling the state of the sub-sector, as well as recommendations to assist the evolution of ASM. Quantitative estimates are provided on the economic contribution of the activity, on employment and income, productivity, mineral recovery and environmental effects. The reports Tanzania 1993 and Tanzania 1997 also contain sections with equipment suggestions and recommended tools for artisanal mining.

The reports do not investigate the effects of macro policies on ASM activities, inter-sectoral linkages or economic and commercial multiplier effects. The studies also do not present specific indicators against which change could be measured, although indicators such as employment, income and productivity for which data are reported could be used. Tanzania 1993 does not mention limitations related to data collection and analyses nor does it make recommendations for further evaluation, data collection and analysis. Tanzania 1996 notices a lack of statistical data on the economic linkages of ASM with rural communities, and states a need for an assessment of the effects of children participation and additional research on the health hazard of mercury contamination. Tanzania 1997 specifically mentions a lack of data on health and safety, and recommends further research on the role and status of women and on the causes of child labor in artisanal mining.

3.3.14 Zambia

Two reports on ASM in Zambia have been reviewed. Zambia 2001 (ANNEX II.14.1.) is a country chapter in the MMSD-study “Small-scale Mining and Sustainable Development within the SADC Region”, carried out with the purpose to characterize the nature and extent of small-scale mining activities in terms of economic, social and environmental impacts and their role within rural sustainable livelihood strategies. The report does not explain the methodology applied, but apparently is the result of a desk study based on a literature review. The study presents only a general description of the ASM sub-sector, which in Zambia is essentially limited to gemstone mining, and provides little quantitative data required to accurately profiling the activity. The report, thus, does not meet the objective stated in the MMSD-study on the SADC-Region and cannot be considered a full baseline survey.

Zambia 2002 (ANNEX II.14.2.) was conducted with the objective to provide an overview of the potential of Zambia's gemstone sector and to demonstrate the potential to increase value-added production in the gemstone sector and determine the sector's feasibility in generating export earnings and employment. The study contains much detailed information on current export earnings and the country's potential to increase them, as well as a detailed analysis of the problems hindering the

development at the moment. It gives a good overview on possible pot-holes which potential investors currently face in the country and gives reasonable recommendations on how the government and the donor community could improve their policies to encourage a positive change.

However, the study can not be seen as a baseline-study as such. It does not give a comprehensive picture of Zambia's ASM sector and its environment and does not provide specific indicators that could be compared with other sectors or countries, or against which change could be measured. It does not investigate the effects of ASM activities for the country's socio-economic situation or on livelihood of mining communities. Besides that, the research just covers gemstone mining, which is the largest, but not the only mineral mined within Zambia's ASM sector.

3.3.15 Zimbabwe

Zimbabwe 2001 (ANNEX II.15.) is a country chapter in the MMSD-study "Small-scale Mining and Sustainable Development within the SADC Region", carried out with the purpose to characterize the nature and extent of small-scale mining activities in terms of economic, social and environmental impacts and their role within rural sustainable livelihood strategies. The report does not explain the methodology applied, but apparently is the result of a desk study and literature review with limited fieldwork.

Although the report forms only a chapter in a regional profiling study, it provides much useful information on the activity in the country. It explains the recent rapid growth of artisanal and small-scale mining as a response to a combination of distress situations brought about by an economic structural adjustment program and regional droughts affecting agricultural yields. The report repeatedly notes the difficulties in quantifying the contribution of the activity to the national economy due to the informal nature and related lack of data. The study goes beyond its original profiling objectives by making a number of specific recommendations designed to transforming the sector into a more environmentally friendly and sustainable activity.

4. GAP ANALYSIS

Supplementary to the detailed review of individual studies, a review and analysis of the baseline studies as a whole is conducted in this section to highlight differences and commonalities of approach and results, and to make a preliminary determination of any apparent gaps or omissions related to

- i. the social, economic, political, governance, demographic, and technological characterization of the activity, the miners and their households and communities
- ii. the understanding of how artisanal and small-scale mining function and fit into the broader developmental, and local/regional economic context
- iii. the understanding of how cross-cutting issues like mobility and migration, HIV/AIDS infection and transmission, environmental degradation and health, gender, child labor, resource conservation across generations, equity and governance of resources, are treated and integrated into profiling studies
- iv. the understanding of the extent to which the activity contributes to the reduction of poverty and the development of sustainable livelihoods in areas where its practice is significant.

4.1 Differences and commonalities

4.1.1 Approach

An obvious commonality in baseline reports is that of methodology, although many of the studies do not disclose details on the methods applied. All of the full baseline studies reviewed use a common approach consisting of a combination of desk research and field surveys for the purpose of data collection and information gathering. The desk research component usually includes the screening and interpretation of the recent pertinent literature on artisanal and small-scale mining in the study country and on a global level. In addition, documentation on legislation, government policies and programs related to mining in general and artisanal and small-scale mining in particular is reviewed and evaluated in this process.

In spite of this commonality of methodology, major differences exist in the principal research focus. While in the earlier generation of baseline surveys investigations concentrated on legal and technical aspects at the operational level, the new generation of baseline studies focuses on poverty reduction and sustainable livelihoods in the community context.

Substantial differences can also be observed with respect to the number of researchers involved in baseline surveys. Full baseline reports are usually carried out by interdisciplinary teams numbering 3 to 10 researchers. For example, Tanzania 1996 employed 3 researchers, Ghana 1987 and Ghana 2002 each had 4, while Tanzania 1996 reportedly used 5 researchers plus another 5 supporting experts.

By contrast, most of the shorter profiling reports are usually carried out by one single researcher, frequently an academic from a university in the study country. For example most of the country reports included in the SADC 2001 regional study, as well as Burkina Faso 2001b, Ghana 2001 and Mali 2001, have been prepared by a single researcher. In addition, these reports are exclusively or largely based on secondary information.

Differences also exist with respect to field surveys which vary considerably in terms of duration and number of sites visited. The duration of field surveys typically ranges from a minimum of about one week to 10 days, as in the case of Mali 2002, Cameroun 1998 and Guinee 2002, up to 3-4 months, as in the case of Ghana 1987 and Burkina Faso 2001a. The number of site visits reported ranges from one ASM area in the case of Mozambique 2001 up to more than 100 mine sites in eight mining zones as in the case of Tanzania 1996. An illustrative example in this context is the baseline survey Tanzania 1993 in which one single researcher visited 24 mines and processing operations traveling nearly 6,000 km by road in a time span of about 3 weeks.

On the other hand, much of the field work approach is comparable among baseline studies. Target sites for fact-finding missions are commonly selected based on the intensity of artisanal and small-scale mining activities, overall importance in the economy and familiarity of the research team with the area. The most common data collection methods are a combination of stakeholder interviews, supplemented by direct on-site observations. In the field survey for Tanzania 1993 cited above, one single researcher held discussions with over 60 officials, claim holders, miners and private sector interests, documenting observations in detailed trip notes supported by photographs. The newest generation of baseline studies differs from the older reports in that it applies the sustainable livelihoods approach in the diagnostic work and that it places particular emphasis on the interrelationship of ASM with the communities in the analysis. In these studies additional social science based techniques are employed, including village and household surveys.

4.1.2 Results

Commonalities in results exist mainly with regard to the profiling of the attributes and the description of key characteristics of artisanal and small-scale mining documented in the different baseline studies. Most of the baseline reports come to similar conclusions in their assessment of the negative aspects of the activity, such as technical limitations, notably the use of inadequate mining and processing practices, low productivity and mineral recovery, as well as health and safety hazards and the harmful environmental effects of the activity.

Since baseline reports come to comparable results regarding the problems of artisanal and small-scale mining, commonalities can also be observed with respect to the recommendations for reform, where such recommendations are made. To the extent that policy recommendations are proposed they commonly include amendments of mining legislation to simplify licensing procedures, institutional strengthening of mining authorities, provision of training materials and programs for the miners, facilitating access to appropriate technology, and access to financial markets.

Due to the varying scope and analytical depth of the baseline reports, great differences can, however, be observed regarding the detail of data presented, the specific conclusions drawn and the extent to which measures for improvements are proposed. Some of the full baseline studies provide detailed data on many aspects of the sub-sector, supplemented by suggestions and guidelines for policies and programs required to strengthen the sub-sector. For example, Ghana 1987 contains a section on equipment suitable for small-scale mining complemented by manufacturer brochures, while Tanzania 1993 includes an appendix with equipment suggestions and sources. Tanzania 1996 incorporates a comprehensive development strategy for small-scale and artisanal mining and related implementation program, which is derived from the findings of the baseline survey. Similarly, Tanzania 1997 offers a set of emerging policy conclusions aimed at addressing technological

problems uncovered in the baseline survey and at poverty alleviation within the artisanal mining community. And Ghana 2002 concludes the baseline report with recommendations on the up-scaling of small-scale mining and on creating alternative livelihoods in mining communities.

By contrast, most of the shorter profiling reports are confined to a description of the current situation based mainly on qualitative, and often sketchy quantitative information from secondary sources. With most of the less detailed baseline studies, the limited scope of these reports usually is the result of budget and time constraints that are beyond the responsibility of the researcher.

However, even among this group of shorter baseline studies substantial variations in the scope of research and coverage can be observed. This is particularly conspicuous when comparing the country reports included in the MMSD regional study “Small-scale mining and Sustainable Development within the SADC Region”. The MMSD regional study encompasses six country reports, including Malawi, Mozambique, Tanzania, South Africa, Zambia and Zimbabwe. Although the MMSD regional study was based on a common terms of reference (ToR) drafted for MMSD by the World Bank¹³ (refer to ANNEX III), the individual country reports differ extensively both in terms of structure, detail and scope of coverage. While, for example, the studies on Malawi and South Africa fill only 10 pages each, the report on Mozambique and Tanzania each have 25 pages, and the study on Zimbabwe 37 pages. By contrast, the full baseline reports referred to earlier typically have a volume of 100 to 200 pages and more.

Since all researchers used the same terms of reference and had the same time frame, it would be expected that the structure and scope of the country studies should be comparable. The main reason for the big differences in scope and volume of the 6 country reports was the very limited budget provided by MMSD. For this reason, the original ToRs (prepared by J. Davidson, 2001) had already been revised and reduced during the first preliminary workshop with the researchers and MMSD-Southern Africa. However, even then the budget for the 6 country researchers did not allow for ANY field work but only for the review of existing data and material in a desk study, compiled based on the experience of the researchers. At the same workshop it was agreed, that the ToR would only be applicable to the extent that they can be fulfilled as a desk-study. Since the availability of secondary data differs substantially from country to country (e.g. useful data on Tanzania and Zimbabwe, almost nothing on Malawi and South Africa) the results of the individual studies consequently differed as well. Because of this fact, it has been agreed later during the MMSD process that it would not make sense to force the different country studies too much into a common frame since even more information could be lost during this exercise. Under these circumstances, the gaps within the individual studies are an indication of the current availability of baseline data in the 6 target countries.

¹³ Common Terms of Reference for Regional/Country Studies on Artisanal and Small-Scale Mining for the MMSD Project. Prepared by J. Davidson. April 2001.

4.2 Apparent gaps or omissions

4.2.1 Characterization

Practically all baseline reports contain some gaps and omissions relative to the level of information desired for policy and program design, which are due to the nature of the sub-sector investigated. The large proportion of informal and clandestine operations coupled with the seasonality of work and the mobility of much of the work force, makes it impossible to obtain the same amount and quality of information on artisanal and small-scale mining that can be collected in fact-finding missions on medium- and large-scale mining in a given period of time.

Apart from this, the extent and kind of gaps and omissions with regard to the characterization of the activity, the miners and their households and communities, differ with time and type of studies. While most baseline studies provide an appropriate general characterization of the sub-sector, the shorter profiling studies are necessarily shallower in analytical depth and, therefore, present less quantitative and detailed information on the various aspects.

Older baseline reports which tend to have a more technical orientation, usually adequately cover economic, political and technological aspects, but tend to have gaps related the social, governance and demographic aspects of the activity. The early generation of baseline studies also lack the community-oriented focus of the recent profiling work, and thus omit to examine the interrelationship of the sub-sector with the local communities. Ghana 1987 and Tanzania 1993 are examples of baseline studies that provide an excellent account of the mining and processing methods used in the sub-sector, but have gaps and omissions related to investigating relationship of the sub-sector with communities.

As opposed to the older reports, the new generation of profiling studies takes a more holistic view focusing on livelihoods and vulnerabilities of miners, their households and the surrounding communities. Although in these studies previous gaps regarding the social and demographic characterization of the activity and the community are filled, technical aspects receive less attention, resulting in information gaps in this area. Examples of baseline studies in which the investigation of technical problems has been largely omitted include Ghana 2002 and Guinea 2002.

4.2.2 Developmental context

All of the profiling reports provide information that contributes to an understanding of how artisanal and small-scale mining function, yet in varying detail and with different emphasis. As discussed, the older baseline studies describe technical processes and tools used in the sub-sector, organizational structures, marketing arrangements, legal and institutional issues. Recent baseline reports investigate vulnerability, sustainability of livelihoods and the effects on communities.

By and large, however, gaps and omissions related to an understanding of how the activity fits into the broader developmental, and local/regional economic context are clearly more pronounced. While many studies consider artisanal and small-scale mining a significant economic activity in terms of offering employment and income in rural areas where alternatives are scarce, only few attempt to analyse the linkages of the sub-sector with upstream and downstream industries and associated

multiplier effects. Tanzania 1996 is one of the few baseline studies that addresses linkages with the rural economy but the analysis is limited to a few paragraphs without any quantitative data.

The main reason for the persistence of gaps with respect to analysing the developmental context of the activity is again the informal and clandestine nature of the sector. This is highlighted by the following observation made in the baseline study Zimbabwe 2001: “It is now commonly accepted that small-scale and artisanal mining has enormous potential for absorbing greater numbers of people into productive employment in Zimbabwe. However, it is extremely difficult to quantify its contribution to national economy for as long as the sector remains informal in its operations.”

In future baseline reports it will be important to include an analysis of the potential contribution of the sub-sector to development objectives in order to provide justification for assistance programs.

4.2.3 Cross-cutting issues

Information regarding the cross-cutting issues of mobility and migration, HIV/AIDS infection and transmission, environmental degradation and health, gender and child labor can be found in practically all baseline reports, but in most cases the information is limited to comments that these phenomena are widespread in artisanal and small-scale communities without supporting quantitative data.

Although these issues have not been omitted in past baseline work, there are significant information gaps which need to be closed before the true extent of the problems can be accurately assessed. An example in this context is child labor which is mentioned as being typical for artisanal and small-scale mining in most profiling reports, yet very few studies provide numbers to prove the severity of this problem. A noteworthy exception is the baseline study Niger 1999 which is exclusively devoted to this issue.

The situation of gaps and omissions is worse with the issues of resource conservation across generations as well as equity and governance of resources, which have hardly been addressed in previous profiling studies. The principal cause for this omission can be found in the fact that artisanal miners usually have very limited, if any, knowledge of the mineral reserves occurring in the deposits they are exploiting. Filling this gap with available information or reasonable estimates will be a precondition for achieving sustainable development in artisanal and small-scale mining communities, because only if mineral reserves are known in terms of tonnage and grade, investment into improvements of operations can be justified.

4.2.4 Poverty reduction and sustainable livelihoods

Based on the previous discussion, it is probably safe to conclude that all existing baseline reports contain some gaps and omissions related to the understanding of the extent to which the activity contributes to the reduction of poverty and the development of sustainable livelihoods in areas where its practice is significant. While the older reports have gaps regarding the inventory of livelihood assets in artisanal and small-scale mining communities, the newer studies lack the detailed analysis of the technical problems that need to be solved.

Both categories of information are essential for the design of policies and programs suitable to transform the sub-sector into a sustainable mode capable of reducing poverty in miners' households and their communities. In this context it appears to be appropriate to distinguish between income poverty and non-income poverty. Two strategies by which artisanal and small-scale miners households can reduce income poverty are diversifying sources of income and increasing income from mining. The latter can be achieved by improving labor productivity and mineral recovery, a process which requires an intimate knowledge of the technical constraints the sub-sector faces. Increasing income due to enhanced productivity and recovery will enable ASM households to spend more money on essential necessities, such as food, health care and education, thereby immediately alleviating severe poverty and improving well-being. Over time, higher income will also permit ASM households to gradually accumulate savings required for the acquisition of financial and physical assets, such as land, livestock, housing and consumer durables. Both income from mining and assets contribute to reduce the vulnerability of households in the event of external shocks, thus enhancing the sustainability of their livelihoods.

While increasing income from mining is important, it is only a first step to combat poverty. In a broad definition, poverty is pronounced deprivation in well-being (World Bank, 2001). Apart from material deprivation which can be measured by income and consumption, non-income poverty relates to low achievements in education and health, as well as voicelessness and powerlessness. Poor people are often captured in a cycle of incidences that keep them trapped into poverty. For example, they may live in a area that experiences frequent natural disasters (drought, avalanches), political conflict, incidences of disease such as malaria and HIV/AIDS, and other shocks. Decreasing vulnerability to shocks is, therefore, another key to reducing poverty. Income helps as it allows people to eat better diets, save, and buy insurance. Equally important are access to education, information, and improved public health. The latter means, among others, affordable health care and services, eradication of certain diseases (cholera, malaria), and reducing infant, child and maternal mortality rates. The natural environment is another fundamental resource for development. Deprivation of clean water, forest resources, and agricultural lands can pull people into destitute poverty, whereas adequate access to these resources helps families live better. From this more holistic definition of poverty it follows that baseline work has to go beyond the mere technical analysis of mining operations to the broader view of the sustainable livelihoods approach.

Insofar, gaps and omissions in the existing baseline reports, and their evolution over the last decade, also reflect a common appreciation of past development work in general: *“so far, much more work has been done using consumption or income-based measures of poverty. But some work has been done on non-income dimensions of poverty ...”*¹⁴.

Regarding non-income poverty, newer baseline work covers the various aspects of the integral nature of poverty¹⁵ with more accuracy, but shows an increasing tendency to underestimate the

¹⁴ World Bank: Poverty Net - Understanding Poverty. <http://www.worldbank.org/poverty/mission/up1.htm>. Page downloaded on March 6, 2004.

¹⁵ *“Poverty is hunger. Poverty is lack of shelter. Poverty is being sick and not being able to see a doctor. Poverty is not being able to go to school and not knowing how to read. Poverty is not having a job, is fear for the future, living one day at a time. Poverty is losing a child to illness brought about by unclean water. Poverty is powerlessness, lack of representation and freedom.”*. World Bank: Poverty Net - Understanding Poverty. <http://www.worldbank.org/poverty/mission/up1.htm>. Page downloaded on March 6, 2004.

fundamental importance of the technical constraints of the ASM sub-sector. This, at a conceptual level, is compensated through the process oriented nature of the underlying sustainable livelihoods approach, which puts more emphasis on participative strategies for poverty alleviation than on specific recipes for particular situations. Hence, a reduction of vulnerabilities is expected to enable ASM households to manage stress situations in a better way, and to set resources free, which would be otherwise occupied satisfying basic needs, in order to increase in final instance labor productivity and income.

Past baseline work was frequently also confined to profiling of artisanal mining within the mining context. Thus, the findings do not allow for a detailed comparison with other rural employment opportunities, or provide a deeper insight if artisanal mining communities have a comparative advantage or disadvantage to communities without the opportunity provided by mineral resources. This question might be highly relevant for the inclusion of artisanal mining in national Poverty Reduction Strategies (PRSP's).

In assessing the body of baseline work as a whole, the most significant gaps appear to be the lack of quantitative data that can be used as benchmark indicators. Progress toward poverty reduction and the development of sustainable livelihoods in artisanal and small-scale mining communities can only be measured and documented with appropriate indicators. It will, therefore, be imperative in future baseline work to consistently collect and record quantitative information that can be used to derive meaningful benchmark indicators.

Finally, other gaps that frequently are found in past baseline work include a description of the methodology employed for data collection, of data sources and of limitations encountered. This information should preferably also be made available in future baseline studies.

5. TOOLKIT FOR FUTURE BASELINE STUDIES

5.1 *Basic requirements*

What lessons can be learned from this review of past baseline reports for the design of future profiling work? The review demonstrates that existing baseline studies vary extensively in scope, detail and information presented. Many of the reports do not provide a sufficient amount of quantitative data required for the design of policies and programs aimed at transforming the sector into a more socially acceptable, environmentally sustainable, and economically viable activity, nor for the process of monitoring progress toward these goals.

It is the objective of the present project to develop a norm or standard to specify contents and minimum data requirements of baseline studies. Standardization will increase chances that future profiling work will deliver the necessary information.

An essential output is a “toolkit” providing a standardized set of rules for setting up and carrying out future baseline studies in line with the Yaoundé objectives. The “kit” will serve as an operating or instruction manual describing the basic instruments and tools required in profiling work. The present “kit” for baseline surveys includes the following principal tools:

- A checklist of critical issues and information necessary
- A set of indicators which would serve as benchmarks against which progress towards objectives could be measured
- Methodological guidelines, including data reporting formats, sample questionnaires and recommendations for carrying out field surveys, and
- References or links to other useful resources.

The toolkit will be supplemented by a set of Model Terms of Reference which are presented in the section following the toolkit.

5.2 Checklist of critical issues and information necessary

5.2.1 Introductory remarks

The “checklist of critical issues and information necessary” provides a guideline for:

- a) An evaluation of past baseline work in terms of its thoroughness and relevance to understanding what is required for improving the contribution of ASM to more sustainable livelihoods, and
- b) Future baseline or profiling studies, which would reflect the Yaoundé objectives.

The final checklist is the result of an iterative process, carried out in three steps:

- a) An exhaustive list of potentially relevant issues, based on the review of past baseline work.
- b) Definition of criteria for defining what is “critical” and “necessary”, and restructuring of the checklist.
- c) Refining of the checklist based on feedback from a workshop during the CASM meeting in Ghana.

List of potentially relevant issues

The first drafting of the checklist was guided by the initial structure suggested in the terms of reference; i.e “critical issues and information necessary:

- for characterizing artisanal and small-scale mining activities and their developmental role(s) and impact(s) within communities and regions
- for understanding the effects of particular macro-policies on the sub-sector, such as exchange rates, fiscal and budgetary policies and regulations, land right and titling issues
- for describing the flows of resources across sectors and inter-sectoral economic linkages
- for identifying additional opportunities for complementary or alternative livelihood development and for increasing the economic and commercial multiplier effects of this activity
- for understanding the interplay of important cross-cutting themes like HIV/AIDS infection and transmission, environmental degradation and health, gender, child labor, resource conservation across generations, use rights and governance.”

The exhaustive yet unmanageable list of issues needed to be refined to a more concise checklist that reflects most accurately the situation at the micro-level.

Priority-based checklist proposal

In order to constitute a practical guideline for carrying out future baseline studies within a reasonable timeframe, the final checklist requires emphasis on “*critical* issues and information *necessary*”.

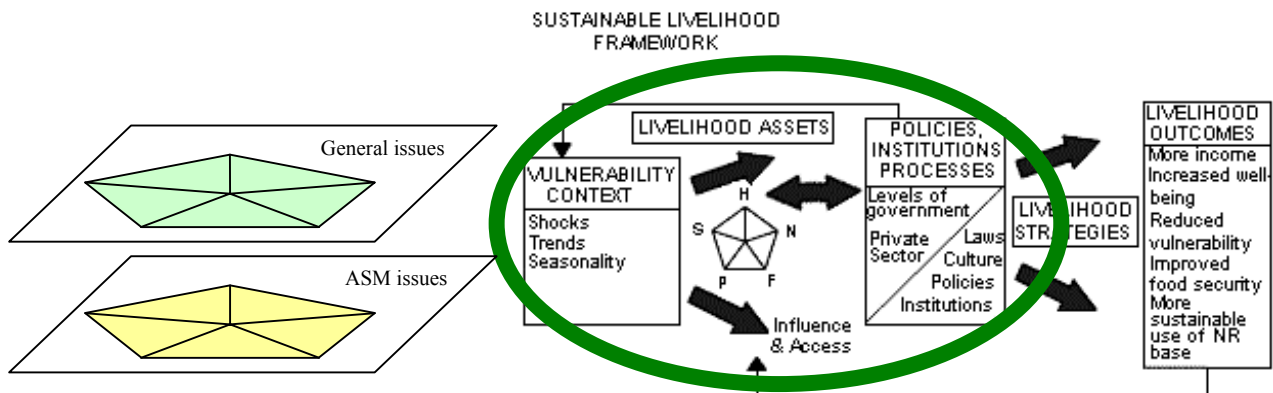
The fundamental assumption, which guides the checklist, is to consider as *critical and necessary* all issues that can be influenced and information that needs to be considered by decision-makers in order to achieve poverty reduction and livelihood improvement in a short or mid-term.

Based on these premises, and in accordance with the above mentioned findings, a proposal for a priority-based checklist, embedded within a Sustainable Livelihood Framework was elaborated for discussion within the project team as well as with external experts and stakeholders at the CASM-meeting 2003 in Ghana.

In designing the priority-based checklist proposal, the Sustainable Livelihoods Framework of the Department for International Development DFID¹⁶ was used to structure necessary information on two layers:

- (a) General issues checklist, characterizing the context of the study area
- (b) Specific issues checklist, characterizing ASM within the study area.

Fig. 1.: Framework for priority based checklist for critical issues and information necessary



More specifically, the priority-based checklist is designed to collect information on the “asset pentagon” (Human Capital, Social Capital, Natural Capital, Physical Capital, Financial Capital) of ASM at both levels, providing:

- (a) at the *general issues* layer a short verbal description of critical issues, and
- (b) at the *ASM issues* layer a breakdown into *assets*, *vulnerabilities* and *structures and processes* specifying the checklist items considered necessary and critical for decision-making or project-planning.

For the purpose of ASM profiling a case-specific sequence for discussing livelihood assets is suggested: (a) natural, (b) human, (c) financial, (d) social and (e) physical capital. In the case of artisanal mining the existence of and the access to natural capital in the form of mineral deposits has a central role, determining even the target area of profiling. The “people-centered” nature of the Sustainable Livelihood Approach suggests discussing human capital as the next issue, followed by financial capital, as income generation is one of the main “driving forces” of ASM. The sequence of discussing physical capital, which comprises mining technology, as the “last” asset, does not reflect low priority ranking (as the underlying idea of the livelihood-pentagon is that every corner is equally important) but the fact that in the final analysis the key to increasing income is productivity, and the key to productivity is technology. The suggested sequence is thus aimed to produce in most cases a

¹⁶ DFID Department for International Development. Sustainable Livelihoods Guidance Sheets. http://www.livelihoods.org/info/guidance_sheets_rtf/Sect2.rtf | download 08/2003.

profile that guides through legal (property of natural capital), cultural, economic and social considerations to processes that allow for determining the most appropriate ways of “how to do” artisanal mining. Nevertheless, the particular objectives of a baseline study may require modifying this sequence.

Feedback from stakeholders at the CASM-workshop for the final checklist (version 3)

The first conclusion resulting from the discussion of the checklist proposal was that cultural aspects are important cross-cutting issues in all 5 asset categories and therefore need to be built explicitly into the checklist design. Second, a general discussion regarding the typical shape of the livelihood pentagon in artisanal mining led to the above introduced sequence of natural, human, financial, social and physical capital.

Natural capital

Knowledge of mineral resources (as the basis for ASM) and legal access to them is one of the main priorities. The institutional landscape of mining authorities appeared therefore more critical to be analyzed than other mining related stakeholders. Environmental implications of ASM are a first priority to be analyzed, together with cultural norms and practices related to natural resources in general.

Human Capital

A broad consensus existed, that the population involved or affected by ASM needs to be quantified, characterized and understood to the highest degree possible. Educational and health related issues are a priority for sustainability of the livelihoods. Surprisingly, issues like leadership capacities appear to be less relevant in African ASM than in other continents. Although HIV was widely discussed in relation to ASM, only few participants check-marked this item as a specifically ASM-related priority.

Financial Capital

According to the poverty-context of ASM, financial capital is another relevant priority, mainly with a view to the employment opportunities of the activity. For the development of ASM, difficult access to financing constitutes the main vulnerability. Although about half of the participants were government officials, only few of them considered tax income from ASM as critical information, while a quantification of its contribution to income generation was considered of much higher relevance.

Social Capital

The most relevant issues resulted to be the organizational structure of ASM, social safety nets, and migration. Information regarding social capital has intimate links with information provided by PRSPs which might serve as a primary input. The public image of ASM was considered by very few participants of the workshop as a priority, while in the opinion of the authors the widely negative image of the (artisanal) mining sector contributes strongly to its marginalization.

Physical Capital

Available ASM-technology was unanimously considered by all participants as a top priority to be known and profiled. Cultural and environmental implications of changes have to be carefully assessed. The endowment of communities with other physical assets (schools, clinics, roads, etc) is important to be documented, as their absence or deficiency presents a major vulnerability.

Preface to final checklist

The final checklist puts strong emphasis on issues considered *critical and necessary* to know. It is also assumed that “profiling” has a substantially different scope than an in-depth sector analysis. Profiling should provide a quick and standardized outline which as close as possible assembles a specific reality and helps to understand it properly.

Reasonable timeframes for profiling are considered between 2 and 4 months, with a workload occupying interdisciplinary teams of between 2 and 4 members. In consequence, the final checklist does intentionally not cover all possibly or academically interesting issues and topics, but a priority based list of what – in the authors’ opinion – is necessary and critical to know. The more exhaustive initial list of potentially relevant issues is presented in ANNEX III.

5.2.2 Checklist for profiling ASM in Africa

5.2.2.1 Definition of ASM

For proper interpretation of the profiling results, the underlying definition of ASM needs to be clearly defined. Frequently, county-, district- or case-specific definitions might be most appropriate in order to reflect specific conditions.

A historic overview of artisanal mining activity contributes to properly characterizing the activity, as it frequently explains the driving forces (livelihood strategies) and helps correlating the development of ASM-activities (ups and downs) with simultaneous events (reactions to external shocks and stresses, vulnerabilities).

Checklist items:

- Definition of ASM used for the purpose of profiling
- Historic overview of ASM in the profiled area

5.2.3 General issues checklist: characterizing the context of the study area

Information about general issues should give an adequate introduction to the profiled area and underlying assumptions, in order to assure proper understanding and interpreting of profiling outcomes. Any study area (country, district, ...) is characterized by its endowment with livelihood assets. This part of profiling should consist mainly of a compilation of existing data. According to the purpose of profiling, ASM related assets will be discussed in the specific issues section.

5.2.3.1 General natural capital

Basic and therefore necessary information comprises a brief description of the study area’s endowment with natural resources, like land, water, flora, fauna, etc., in order to assure proper understanding of the situation.

A more detailed analysis is necessary for assets that are indispensable for the mining process (e.g. water, land, timber, ...) or that might be adversely affected by ASM (e.g. environmental impact, competing land use, ...); access to these assets should be considered critical¹⁷.

Checklist items:

- Overview of significant (non-mineral) natural resources of the profiled area
- (Non-mineral) natural resources required by ASM
- (Non-mineral) natural resources potentially affected by ASM

5.2.3.2 General human capital

The human capital available in a study area constitutes the pool from which artisanal miners are “recruiting”; predominantly from the segment of the “poor”. Poverty – apart of economic terms – is characterized by unfulfilled demands regarding health, nutrition, education and other basic needs. Health issues like AIDS are of primary concern in most African countries. Cultural and religious traditions, including gender issues, are important to be known to the extent in which they constitute (at least in the short and mid-term) quite strict borderlines for the achievability of changes.

ASM baseline surveys need to start from a proper understanding and knowledge of the general human assets of the study area. It can be assumed, that useful information is available from secondary sources (national statistics; social, cultural and anthropological investigations). Deepening of existing information (with the exception of ASM-specific issues) will therefore usually not be necessary, but the relevant issues need to be resumed in order to provide the “whole picture”.

Checklist items:

- Excerpt of relevant statistical data on population, education, health (nutrition, STDs, mortality, ...), etc.
 - Listing of ethnical and religious groups, resuming significant cultural issues and differences
 - Resumed results from existing PRSP baseline studies
- (Note: For all items, gender-disaggregated data if available!)

5.2.3.3 General financial capital

Economic aspects are the driving forces for ASM, independent of being considered a poverty-driven or opportunity driven activity. In order to provide profiling results that specify either of the driving forces, a comparison of the economic conditions in mining communities with the general economic situation of the study area is necessary¹⁸.

Data that characterize the general economic environment (figures on employment, savings, household income, ...; climate for credit, investment, ...) are usually available from national statistics and should be cited for the purpose of comparison between ASM and non-ASM livelihoods. General economic parameters like exchange rate policy, tax regime or others that might have a direct impact on the cost or revenue of ASM are critical to know.

¹⁷ Mineral resources are to be covered in the “ASM specific issues” section of the checklist.

¹⁸ If the economic situation of ASM-communities is worse than the average situation of the study area (country, district), ASM may be characterized as poverty driven; If the mining communities suffer a less degree of poverty, then the activity may be characterized as opportunity-driven (= an opportunity to escape poverty)

Checklist items:

- Excerpt of relevant statistical data characterizing microeconomic conditions like household income, cost of living, capacity of saving, etc., using culturally relevant indicators.
- Summary of the relevant macroeconomic framework, like tax regimes, import- export restrictions, investment climate, etc.
- Effects, constraints and opportunities of official exchange rates

5.2.3.4 General social capital

ASM is frequently addressed as an isolated technical, environmental, legal or social issue. The limited success of strictly problem-oriented project strategies in the past suggests that it is useful to situate ASM within a broader context of the individual and institutional relations forming the “Social Capital”. An exhaustive mapping of the network of relations, especially on the general issues layer, will exceed widely the scope and possibilities of an ASM baseline study; nevertheless, good profiling should be able to distill relevant information on a need-to-know basis.

The preferred degree of detail to describe a study area’s (e.g. county, district, community) social capital is inversely related to its geographic extension: the smaller the area the more detailed the analysis needs to be. For baseline studies with a national scope, issues like institutional landscape (GO’s, NGO’s, Networks), stakeholder portfolios, and aspects of governance are considered relevant. For baseline studies on community level, insights down to the family level are indispensable in order to develop proposals for improving livelihood strategies.

Checklist items:

- Overview of political context, governance, security, justice, human and democratic rights.
- Description of institutional “landscape” and climate of relation between public and private sector
- Description of quality and role of the formal social security system
- Description of traditional hierarchical structures on regional and community level (role of chiefs, ...)
- Description of typical “social contracts” within cultural norms, “regulating” informal property and informal safety nets

5.2.3.5 General physical capital

Physical assets (roads, railways, markets, clinics, schools, ...) should – at the general level – be known mainly in form of nation-wide indicators, in order to establish parameters for comparison with the infrastructural endowment of the ASM-areas to be profiled. Within baseline surveys for profiling ASM-activities, further details at the general level do not appear to be critical.

Checklist items:

- Excerpt of relevant statistical data for physical infrastructure in rural areas.

5.2.4 Specific issues checklist: characterizing artisanal small-scale mining within the study area

5.2.4.1 Natural capital (ASM)

A. Available assets

According to the nature of ASM, mineral resources are usually not explored in categories of reserves. The lack of knowledge of proven or probable reserves makes any mid- or long-term planning extremely difficult. In addition, it greatly increases the investment risk in case of mechanization and reduces chances of loan financing. Rough estimates about probable reserves in the study area, including data on tonnage and grade, can in most cases be obtained by extrapolation of historic production data in combination with geologic interpretation. According to the central role of the mineral deposits for (artisanal) mining this information is in any case necessary and critical for any further planning.

Checklist items:

- Inventory of mineral resources and types of deposits exploited by ASM (including estimates of extension, tonnage and grade)
- Past, actual and projected future mineral production by ASM, obtained from official statistics and reasonably verified by field observation

B. Vulnerabilities

Limited access to formal possession of resources, as well as limited availability of complementary natural assets (water, ...) required by ASM and resulting conflicts of resource usage within the study area should be analyzed in detail, as these issues result frequently in serious constraints for ASM. While ownership of mineral resources has definitely asset-character for conventional mining, the usual difficulties for ASM to access ownership, require treating this issue as a vulnerability for ASM.

Environmental aspects like the ecological sensitivity of target areas for ASM, as well as existing or potentially produced geohazards should be assessed. Obviously, within a profiling study this assessment must not escalate to an extensive EIA, but should allow for a qualitative cost-benefit comparison, based mainly on existing secondary sources of information (inventory of national parks, protected areas, etc.).

Checklist items:

- Requirements for obtaining formal access to resources (mining titles, land rights, etc.) and resulting distribution of formal and informal ownership of properties.
- Inventory of existing conflicts of resource usage (conflicts between different segments of mining, conflicts due to environmental concerns, conflicts due to land or water use, ...)
- Environmentally sensitive areas occupied or targeted by ASM and existing geohazards in ASM areas.

C. Structures and processes

“Structures” determining access to natural capital are in a first place and on the formal level the mining authorities, complemented by other authorities (environmental authorities, geologic services,

etc.) according to national legislation. Simultaneously, the private sector, represented by large mining companies, Chambers of Mines or in some cases NGO's, may have a substantial influence on national mining policy. Profiling of artisanal mining has to provide necessarily an adequate overview of the institutional framework and the public and private key-stakeholders "governing" the mining sector.

Key issues of mining legislation, as well as adjacent land and water rights (if relevant for formalizing ASM) need to be outlined. As ASM can hardly ever be formalized under the same legal schemes applicable for large scale mining, existing special legal provisions for formalizing ASM should be resumed; also in case that no special provisions exist for ASM, this fact needs to be clearly pointed out. Statistical data like number of licences granted, percentage of pending licences, or similar, will provide an idea about the efficiency of the licensing procedures; estimations about the ratio of licensed to unlicensed artisanal miners will provide an idea about how adequate the licensing scheme is for ASM.

Aside of the legal requirements for formal ASM, even informal mining usually has to comply with a significant set of rules, involving the approval of the mining activity by the land owner, the local chief or the community; distribution of benefits, etc. Knowledge of these cultural norms and practices is imperative: large scale mining operations sometimes count with financial resources to enforce their position against the will of the local community, while ASM depends entirely on good relations and therefore compatibility with local cultural norms. This set of cultural rules needs to be identified during profiling, as it constitutes not only the condition under which informal ASM operates, but a complementary framework for any potentially feasible ASM-legislation and formalization efforts.

Checklist items:

Transforming structures (public and private sector institutions)

- Mining authorities, Geologic services, Environmental authorities
- Key-stakeholders of the private sector (Mining companies, Chambers of Mines, NGOs, etc.)

Formal Processes (policies, legislations)

- Mining rights, Land rights, Water rights, Indigenous rights
- Titling issues, legal status of ASM (Number of licensed operations by type, Number of pending licenses, Estimated number of unlicensed mines/miners)

Informal Processes (rules, culture, relations)

- Cultural rules, norms and practices determining the "approval" of ASM activities by local communities and consensual access to the deposit.
- Political and cultural factors determining access to and power over natural capital, including inequality based on gender, wealth, and ethnicity.

5.2.4.2 Human capital (ASM)

"Human capital represents the skills, knowledge, ability to work and good health that together enable people to pursue different livelihood strategies and achieve their livelihood objectives."¹⁹ Artisanal miners usually require a broad spectrum of skills, controlling a complex production process (geology, mining, processing, marketing) at a technological level according to their possibilities.

¹⁹ DFID, 2003: Sustainable Livelihoods Guidance Sheets. http://www.livelihoods.org/info/guidance_sheets_rtf/Sect2.rtf

A. Available assets

Profiling the human capital is perhaps the most difficult task within ASM profiling, as “statistical” data – with exception of the health and educational baseline data – contributes very little to understanding “the miners”. A proper understanding of the multiple idiosyncrasies of different groups might surpass the time available for most profiling work, but should be attempted to the widest extent possible within the given timeframe of a profiling study.

Data on sanitary situation, nutrition, health and educational services available in the ASM areas should be obtainable from national, departmental or local statistics. Local hospitals, sanitary posts or schools are usually willing to share their information. The information is relevant in order to compare the conditions for the development of human capital in ASM areas with conditions in similar non-mining rural areas.

Access to information is another issue building human capital. Opportunities to access information in ASM areas are usually limited, in a similar or even worse way than in other rural areas. The identification of existing information channels within a profiling study will allow for later decisions on how to make training or capacity building most efficient.

Checklist items

- Population involved in ASM and their idiosyncrasies; Break down of information (per age, gender, regions, mines); Origin of population (local or migration), Socio-economic-cultural stratification according to level of participation; Skills, knowledge and experiences; correlation with technical level and/or economic level (business skills) of operations or communities
- Compilation of statistics and registers describing health conditions, nutrition standards, educational opportunities (availability of primary, secondary education) in the ASM communities.
- Access to further capacity-building information: general and ASM-specific information (training materials, commodity prices)
- Rules of access to human capital resources based on gender, age, wealth, or other characteristics

B. Vulnerabilities

Occupational and environmental risks of artisanal mining may jeopardize the health of the miners, their families and even adjacent communities. Extensive screening or sampling campaigns exceed the scope of profiling; proper identification of existing risks nevertheless is necessary and possible without excessive resources, given the presumed interdisciplinary expertise of the profiling team.

Human capital is most at risk, when affecting children and future generations. Specific conditions of health and educational issues of children need to be highlighted. Within this context, child labor is a very relevant issue, as it might jeopardize the health of the involved children as well as their ability to attend school on a regular basis. Child labor issues have to be profiled very carefully in order to avoid any misinterpretation between non-acceptable *real child labor*, and acceptable participation in *family based ASM*.

STD's (sexually transmitted diseases), and especially AIDS, may be relevant issues in ASM communities, particularly in case of boom-type ASM operations where miners live during weeks or months separated from their families. Hence, the question if AIDS is an ASM-specific issue or not, has to be answered on a case to case basis.

Checklist items:

- Specific occupational and environmental health risks of ASM
- Health, educational and nutritional situation for children; incidence and character of child labor: physiological issues, health hazards of child labor, educational issues
- Possible correlation between incidence of AIDS and ASM specific conditions (percentage of HIV infected people reported higher or lower than in national average?)
- Identification of the most vulnerable groups in ASM communities

C. Structures and processes

Formal structures supporting the creation and maintenance of human capital are educational and healthcare facilities. Readily available are in most cases only quantitative data (statistics); quality of services in ASM-areas, in comparison to other rural areas or to national average, is more relevant but might be more difficult to be evaluated within the limited timeframe of a ASM profiling study; nevertheless, if data is available it should be included.

The usual deficiencies of public healthcare, education and social security are frequently compensated by creative and innovative mechanisms of self-help, usually based on traditional distribution of responsibilities. A complete analysis of existing relations might exceed the scope of ASM-profiling; ASM-case-specific self-help practices (e.g. teachers contracted by ASM-communities, medical assistance to mine-workers paid by mine-shareholders, community activities, etc.) should be highlighted, as they have an inherent potential to be replicated in other communities.

Aspects of leadership, according to the results of the profiling workshop during the CASM-meeting 2003 seem to have inferior importance in African ASM; probably due to traditional and predominantly hereditary forms of leadership (chiefs). Leaders – without regard of being traditional or elected – need to be identified during profiling, as subsequent implementation of programs will be in emerging need of interlocutors.

Checklist items:

Transforming structures (public and private sector institutions)

- Health care facilities in ASM communities (public, private and traditional health care) (quality, quantity, roles, accessibility)
- Educational (schools) and training facilities

Formal Processes (policies, legislations)

- Access to public healthcare, education, social security for ASM miners and their families

Informal Processes (rules, culture, relations)

- Self-help activities and practices
- Personal capacity building, forms of leadership, list of identified leaders

5.2.4.3 Financial capital (ASM)

While generating products of high intrinsic value, like gold, diamonds and gemstones, artisanal miners and their families are typically poor. The fact that ASM is not frequently taken into account

in national Poverty Reduction Strategies or portfolios of Development Agencies, underlines the common misunderstanding of basic ASM-economics.

A. Available assets

ASM constitutes an opportunity for the poor for income and employment generation, producing more or less regular inflows of money and in consequence, financial capital. Although this may sound trivial for anyone with a basic knowledge of artisanal mining, it may be far from being immediately visible to political decision makers. One of the reasons may be that – due to the predominantly informal nature of ASM – surplus income or savings are frequently not invested in the mine but in other sectors (real estate, construction in nearby cities, agriculture, livestock, etc.).

Assessment of financial assets created by ASM needs to be done from bottom up whenever possible, estimating production costs and revenues on an individual basis (“typical miner’s household income”), and estimating consolidated income generation for communities, districts and up to national level. The result may differ significantly from official production or export statistics, according to the impact of smuggling on national statistics. Regardless of the procedure of export (formal or informal) the income generated by ASM contributes directly to poverty reduction and the circulating money stimulates local economies. The extent to which this happens has to be analyzed by ASM-profiling in order to provide “hard facts” to decision makers.

Taxation issues frequently brought up when discussing informal ASM are far less relevant than generally assumed. In practice, tax income from formal ASM might be even inferior to informal ASM, as formal miners are able to recover paid VAT (value added tax).

Checklist items:

- Employment opportunities provided by ASM and economically linked activities (transport, workshops, merchants, shops, gem cutting, etc)
- Income generation from ASM [desegregation as far as possible: at national level (relevance of ASM for foreign export balance and GDP), district -, local and individual level (typical household income)]
- Identification of cross-sector effects and flows of economic resources across sectors; Quantification of inter-sectoral upstream linkages with local providers of goods and services and local development role of ASM, downstream linkages with manufacturing based on domestic minerals, creating aggregate value

B. Vulnerabilities

Depending on the local situation, ASM may require investment surpassing the individual miner’s capacity. While this limitation can be partially overcome by creation of associations, cooperatives, etc., at a certain moment access to (formal or informal) credit may become critical and constitute one of ASM’s key-vulnerabilities, leading to dependencies and even involuntary linkage to criminal activities.

Commodity prices in the ASM areas are necessarily and inherently lower than on the world market, as intermediary traders need to cover their costs, risks and profits. Cases where the price-difference exceeds reasonable trading margins should be highlighted in profiling studies, independent of the potential origin (excessive profits or regulated market).

Checklist items:

- Access to credit and dependencies from private creditors and money lenders; sometimes related with ownership of production facilities (equipment owner as “investor”)
- Arbitrariness of prices for products, lacking market information systems or competitive buyers.
- Linkages with criminal activities: Drug traffic, weapon traffic, money laundering, smuggling

C. Structures and processes

While the official financial sector (banks) traditionally ignores ASM (specific credit lines for ASM exist only in exceptional cases), sources for financing ASM can predominantly be found by investors of the private sector. Besides of private creditors and money lenders already mentioned in B, mineral buyers and buyers’ organizations (sometimes even governmental) may play an important role. ASM profiling should enumerate and attempt to quantify the sources of financing.

The role and attitude of fiscal authorities towards ASM needs to be briefly characterized, especially when it can be reasonably assumed that fiscal considerations are actively promoting informality (excessive taxes; elevated royalties, market regulations, etc.).

The relation between ASM and the official financial sector (banks) happens to be frequently a mutual one: If banks don’t trust artisanal miners, artisanal miners don’t trust banks. In consequence miners might be looking for traditional alternatives for the use of surplus income or savings. Acquisition of real estate properties (land, houses), investment in agriculture or livestock, or even in consumer goods and social prestige might be the most frequently chosen options. Investment in mine improvement might frequently be a second choice, being considered an option mainly by formal miners. Altogether these practices make savings by the ASM sector less transparent to official statistics, and for profiling purposes visible proxy-indicators might be needed (like investment in social prestige).

Checklist items:

Transforming structures (public and private sector institutions)

- Official credit lines for ASM, Mineral buyers, buyers organizations, money lenders
- Fiscal authorities and market regulations

Formal Processes (policies, legislations)

- Linkages between fiscal policies and ASM: Direct taxes, fees and royalties, Indirect taxes, Sanctions in case of tax evasion, Benefits in case of compliance

Informal Processes (rules, culture, relations)

- Use of surplus income, alternative and traditional options for savings
- Presence or absence of a culture of re-investment in the mine

5.2.4.4 Social capital (ASM)

For the purpose of ASM profiling, social capital should be understood as the “connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from

them”²⁰. In the context of the sustainable livelihoods framework, it means the social resources upon which people draw in pursuit of their livelihood objectives.²¹

A. Available assets

As valid for almost any group, the organizational level is a key issue determining the potential for future development. Accumulation of social capital assets in form of organization is of vital importance for the ASM sector, and consequently in-depth knowledge about existing organizational forms, roles and mechanisms of interaction are critical to be acquired by profiling studies. For practical reasons, existing organizations can be divided into (i) groups related to community activities and administrating the physical capital of the community, (ii) work related groups organizing the use of natural capital (in case of ASM: the mineral deposit), and (iii) groups administrating financial capital (savings and credit groups). Profiling work should not only identify existing formal organizations, but also evaluate their legitimacy and representation, as well as explore other existing informal organizational forms. This knowledge is critical and necessary, as these structures will become either partners or opponents of any intervention oriented towards ASM.

Typical organizational forms on the micro-level, defining the distribution of roles and income within the family context of ASM, as well as organizational structures of self-employment schemes are also desirable to be known. Traditional relations within and between families constitute basic building blocks for higher-level organizations. Furthermore, any potential external intervention (project) will cause intentional or involuntary modifications of the intra-family distribution of work and income. In order to be able to predict the consequences, the knowledge of locally typical family structures has to be considered “critical and necessary”.²²

Public opinion about ASM – as the manifestation of social acceptance of ASM by the rest of the population in a target area – was not considered a priority issue by the participants of the CASM-workshop. Nevertheless, it is the author’s opinion, that public opinion is critical as it widely determines the behavior of decision-makers towards the ASM sector.

²⁰ Putnam, R.D. (2000). *Bowling alone. The collapse and revival of American community*. New York: Simon and Schuster., p. 19

²¹ “These are developed through:

- **networks and connectedness**, either vertical (patron/client) or horizontal (between individuals with shared interests) that increase people’s trust and ability to work together and expand their access to wider institutions, such as political or civic bodies;
- **membership of more formalised groups** which often entails adherence to mutually-agreed or commonly accepted **rules, norms and sanctions**; and
- **relationships of trust, reciprocity and exchanges** that facilitate co-operation, reduce transaction costs and may provide the basis for **informal safety nets** amongst the poor.

Of all the five livelihood building blocks, social capital is the most intimately connected to Transforming Structures and Processes. In fact, it can be useful to think of social capital as a product of these structures and processes, though this over-simplifies the relationship. Structures and processes might themselves be products of social capital; the relationship goes two ways and can be self-reinforcing. For example:

- *when people are already linked through common norms and sanctions they may be more likely to form new organisations to pursue their interests; and*
- *strong civil society groups help people to shape policies and ensure that their interests are reflected in legislation.”*

DFID, 2003: Sustainable Livelihoods Guidance Sheets. http://www.livelihoods.org/info/guidance_sheets_rtf/Sect2.rtf

²² Mechanization of ASM mineral processing operations, in order to increase productivity, may cause women to lose their income opportunity; if the family budget for food and education depends on the women’s “pocket”, a well intentioned effort may rapidly turn into a shock.

Checklist items:

- Existing organizational structures of ASM and their legitimacy or representation structures which might become stakeholders in ASM related programs; Discussion of their relevance at different levels (community-level, “second floor” Chamber-type umbrella organizations); including informal organizations.
- Internal micro-level organization schemes: Community and family context of ASM, gender roles within and related to ASM; Self-employment schemes (Ad-hoc groups, Cooperatives, Collectively or community owned firms) and Employer-employee schemes (Single-proprietorship firms, Corporations)
- Public opinion about ASM (relevance to be evaluated on a case-by-case basis)

B. Vulnerabilities

Individualism and distrust usually characterizes ASM, especially in case of high-intrinsic-value minerals (gold, gemstones). While the individualism is inherently obstructing organization, the organizational disintegration of the sector constitutes a complementary potential of conflicts (miners/miners, miners/communities, miners/companies), and thus a major vulnerability for the sector. In case of disputes between ASM groups and mining firms, the lack of organization affects both parties, the artisanal miners unable to articulate, and the mining firms, lacking legitimate counterparts to negotiate.

Migration issues related to ASM need to be profiled, according to their significance in the target area. While ASM has the positive potential to avoid migration from rural to urban areas, spontaneous massive migrations following mineral discoveries frequently disrupt existing local communities, or create new “boom-towns” which may conflict with adjacent traditional communities. The history and frequency of such ASM-induced migrations needs to be included in profiling studies.

Lack of social capital in form of legitimate organizations furthermore affects the miner’s potential to negotiate their interests with local or central governments.

Checklist items:

- Inventory of existing conflicts (between rivaling ASM-groups, between miners and local communities, between ASM-miners and mining firms, etc)
- Migration issues: Positive effect: Avoiding migration (Providing employment in rural areas); Negative effects: Promoting migration towards “boom towns”, disrupting local organization processes
- Effectiveness of miners associations in representing ASM interests at government level

C. Structures and processes

The discussion of structures and processes related to social capital, as mentioned in the introductory remarks to Social Capital, should avoid redundancy with structures that constitute social assets, like ASM organizations. Profiling the structures should therefore focus of institutions in need, open or interested to communicate or cooperate with an organized ASM sector. This analysis may lead to a list of authorities, institutions and allies, eventually even more significant for the development of sustainable ASM livelihoods, than the usual list of stakeholders related to the mining sector. PRSP’s frequently omit a in-depth analysis of the ASM sector, although the proposed strategies apply also to ASM; existing PRSP’s are therefore a good starting point for the analysis.

The legal and institutional framework of a country has a significant influence on organization processes and in consequence on governance relying on public participation. The concordance of typical social contracts within the ASM sector with the existing legislation defines in last instance the possibility or impossibility of formalization of ASM, as the social contracts reflect the acceptance of legislation by the society within existing cultural norms and practices.

Social Capital creates safety nets. Safety nets are needed to make livelihoods sustainable. The prevailing nature of formal or informal safety nets needs therefore to be profiled.

Checklist items:

Transforming structures (public and private non-sector institutions)

- Analysis of public and private institutions (others than the sector related institutions analyzed in Natural Capital) interested in promoting an organized ASM sector
- Applicability of existing PRSP's to the ASM sector

Formal Processes (policies, legislations)

- Analysis if existing legislation promotes or obstructs the conformation of ASM organizations
- Access of ASM to formal safety nets and social services

Informal Processes (rules, culture, relations)

- Role and importance of informal safety nets, self-help initiatives, etc.

5.2.4.5 Physical capital (ASM)

A. Available assets

Mining, even at an artisanal level, requires considerable investment; this comprises not only mining equipment but also investment in development of the mine. It is a technical process that requires the use of simple tools or more sophisticated machinery, according to the deposit to be mined. Profiling work must therefore give a clear overview of applied technology and especially their appropriateness. The later needs to be analyzed with extreme care: “inappropriateness” of the technology must not be diagnosed unless the evaluating technical professionals are able to propose better alternatives which can be implemented under the existing financial constraints of ASM, and with at least equal economic results.

The endowment of mining communities with public physical assets (roads, schools, medical facilities, ...) in comparison to non-mining communities reflects governmental attitude towards ASM.

A characterization of the typical housing of miner's families allows for an appreciation of average personal physical capital and living conditions. Besides of contributing to better understanding of the conditions of life, housing quality frequently correlates with permanent or temporary nature of ASM.

Checklist items:

- Technology used in ASM and degree of mechanization, including assessment of suitability in terms of productivity and mineral recovery
- Average and minimum investment required for a typical production unit to improve productivity and mineral recovery
- Endowment of ASM communities with public infrastructure (roads, schools, medical facilities, drinking water, waste management, communication...); typical contribution of ASM to creation and maintenance of the infrastructure
- Typical housing of miner's families (correlation between quality of houses and age or time-horizon of ASM activity indicating permanent or temporary nature of ASM)

B. Vulnerabilities

In case of proofed technological “inappropriateness” the main vulnerability consists in deficient access to information about technological alternatives, which might be related to human capital (educational issues). Otherwise, low technological standards may be more related to financial capital (lack of access to financing or credit), or natural capital (ownership of mineral resources, uncertainty of investment due to titling issues), etc. These issues and interferences might need to be clarified during profiling work.

Other frequent vulnerabilities are related with maintenance of public infrastructure and continuity of services. As these are unfortunately common vulnerabilities in rural areas, what interests most in the context of ASM profiling, is the existence of eventual differences between ASM and non-ASM communities with regard to quality of services.

Checklist items:

- Reasons for “inappropriateness” of mining technology
- Continuity or discontinuity of services, vulnerability due to seasonal changes (transport during rainy season, water supply during dry season...)
- Proximity and access to basic services (health, schools, ...)
- Quality of services, responsibilities for maintenance

C. Structures and processes

Structures with a capacity to improve mining related physical capital are generally related to access to financing, which should be discussed in the corresponding financial capital section. A possible exception is the existence of specific investment promotion programs (e.g. machinery pools) which – in this case – should be included under physical capital.

Adoption of alternate technologies, nevertheless, not only depends on rational or economic considerations. Cultural attitudes towards changes or innovations may constitute barriers difficult to break, and should be explored carefully. This aspect may be specially relevant with regard to mechanization in order to increase productivity, as mechanization usually alters the traditional distribution of benefits among social or gender groups, or may – in case of accelerated depletion of the deposit – even alter resource usage among generations.

Given the nature of ASM as economic activity in rural areas and ASM's importance for local economies, improved infrastructure may result from progress towards decentralization. An overview of authorities on different governmental levels will help to identify critical bottlenecks. The analysis should not only cover the administrative competences and processes at different levels, but also the

degree of compliance with the official duties. While this seems reasonable in some cases, it might exceed the scope of ASM profiling in other cases.

The endowment of a community with public infrastructure depends not only on the public sector. Initiative of self-construction and/or the community's participation in public works is frequently required to "speed up" the process. Profiling should determine if this is the case in ASM communities, and how the initiatives of ASM communities compare to non-ASM communities. Similar to this issue, the culture of maintenance of public infrastructure by the community determines the quality of services.

Checklist items:

Transforming structures (public and private sector institutions)

- Existence of investment promotion programs (instruments for financing ASM equipment)
- Authorities on national, district and local level, in charge of basic infrastructure,

Formal Processes (policies, legislations)

- Procedures for solicitation of public physical infrastructure, compliance of public officers with their duties (according to scope of ASM profiling).

Informal Processes (rules, culture, relations)

- Attitudes towards technological changes or innovations
- Critical analysis of benefits of technological changes (benefited and affected groups)
- Culture of self-construction and appropriation of local public infrastructure by local population (user's responsibility for maintenance)

5.3 Benchmark indicators

5.3.1 Selection criteria

The second set of tools pertains to benchmark indicators. An indicator is a relatively simple measure to characterize a more complex concept or situation, which allows for comparison across time and space. Indicators have to provide information on the state of a system and its change over time. They are the yardsticks to measure performance and progress.

Indicators are useful when a concept is multi-faceted or difficult to quantify. An example of a multi-faceted concept is health, which includes the physical strength to perform daily life activities, resistance to disease, having strong teeth, and being well-nourished, among other things. We may observe that person A looks healthier than person B, but it is difficult to say that person A is five times more healthy than person B. By asking people about the number of lost work days due to illness over a certain period, and by measuring their Body-Mass Index ($\text{Weight}/\text{Height}^2$), we obtain a more objective and systematic indication of relative health. It is advisable to use multiple indicators to measure one concept.

An example of a difficult to quantify measure is income. Household incomes of poor rural families are typically *unrecorded*, that is, they are not written down. They tend to be *variable* and *intermittent*, or changing from day to day with undefined periods with and without, income. A certain share of income may be from subsistence production (e.g. home-grown vegetables) rather than money, which is difficult to quantify. And they often come from *various* different sources in different currencies. Consequently few people will be able to answer the question: “How much did you earn this year?” In this situation it is necessary to find things that we can measure or count and that will give us an idea (an indication) of what households are relatively wealthier, and which ones are relatively poorer.

Good benchmark indicators

- are measurable with reasonable effort in terms of costs, time and skills required;
- are repeatable over time;
- can be generalized across a certain space – depending on the objective this space can be one village or a region;
- measure the target concept;
- are pertinent, relevant to the community and culturally appropriate;
- are quantifiable or allow for weighting;
- are verifiable and consistent (different researchers should obtain a similar value for the same indicator at a specific time and location);
- must be clearly defined in terms of their purpose, underlying assumptions and limitations.

As a first step, system variables have to be selected which are suitable to characterize artisanal mining communities and activities and to monitor progress toward Yaoundé objectives. From this it follows that indicators have to be identified that directly or indirectly measure poverty and livelihood in ASM communities and for comparative purposes also in non-mining communities of target countries. In addition, indicators will be required that also capture the causes of poverty. According to the basics of economics, the key driver in the vicious cycle of poverty is low productivity. Therefore, measures of productivity will have to be included in the set of indicators.

Apart from labor productivity, an important additional variable in mining is mineral recovery. It is an indicator of the overall performance of utilizing the existing in-situ resources. Both productivity and mineral recovery are essential variables, affecting revenue, cost and income, the key driver in breaking the vicious circle of poverty.

In line with the sustainable livelihood approach, the set of benchmark indicators will be structured according to the asset pentagon, i.e. natural capital, human capital, financial capital, social capital and physical capital. For each of these capital categories, indicators will be provided at the national level and the community level. Indicators at the national level provide the reference line required for an assessment of the situation at the community level. Most of the national level indicators used are routinely collected and published by the World Bank in the annual volumes of World Development Indicators and in United Nations statistics, and can, therefore, be obtained with little effort.

The community level refers primarily to ASM communities, although for comparative purposes non-ASM communities can be included. Apart from national level and community level indicators, a set of specific indicators related to the ASM operation level will be included.

In order to ensure the use of a standardized mode of data collection in field surveys and the comparability of information across ASM districts, communities and countries, definitions of the indicators suggested have to be provided. For national and selected community level indicators, the relevant definitions used by the World Bank should be applied, while for others, notably mining related indicators, specific conventions have to be adopted for the purpose of uniform application in baseline studies. Definitions of indicators used are included in ANNEX IV.

5.3.2 Sustainable Livelihood indicators

5.3.2.1 *Natural capital*

Natural capital encompasses resources provided by nature required to sustain livelihoods. Natural assets are essential for those who derive their income from resource-based activities, such as farming, fishing, forestry or mineral extraction. Table 5.1. summarizes the natural capital indicators considered important in profiling work.

At the national and community level natural resource endowment is measured in terms of the percentage of arable land, cropland and forests, and the availability of freshwater resources. The rate of the average annual deforestation, as well as biodiversity indicators, such as the number of species of higher plants, mammals and birds, can be used to judge the conservation of natural assets. The annual rate of deforestation caused by population growth is high in a number of low income African countries, ranging from 1 % to 3 % and more. Rapid deforestation can lead to soil erosion and a loss of natural biodiversity.

For rural households land is the most important asset. Land used for food production can significantly reduce the vulnerability of the owner in cases of external shocks, such as loss of employment. Information on the ownership of land, including the size of the land owned is, therefore, essential in assessing livelihoods of rural communities. Mineral reserves, the most important natural asset of the extractive sector, will be included in the set of indicators to be monitored at the ASM operation level.

Table 5.1.: Natural capital indicators

National level	Community level
Land use <ul style="list-style-type: none"> • Arable land [% of land area] • Permanent cropland [% of land area] 	Land use <ul style="list-style-type: none"> • Arable land [% of land area] • Permanent cropland [% of land area]
Water <ul style="list-style-type: none"> • Total freshwater resources [m³/capita] 	Water <ul style="list-style-type: none"> • Total freshwater resources [m³/capita]
Forests and Flora <ul style="list-style-type: none"> • Forest area [% of total land area] • Average annual deforestation [%] • Higher plants species [number] 	Forests and Flora <ul style="list-style-type: none"> • Forest area [% of total land area] • Average annual deforestation [%] • Higher plants species [number]
Fauna <ul style="list-style-type: none"> • Mammals species [number] • Birds species [number] 	Fauna <ul style="list-style-type: none"> • Mammals species [number] • Birds species [number]
	Household ownership of land <ul style="list-style-type: none"> • Share of households owning land [%] • Average size of land owned [ha/household]

5.3.2.2 Human capital

The most significant human assets are skills and knowledge acquired through education, as well as good health. Both are essential preconditions for productive work and for reducing the vulnerability of livelihoods. Selected human capital indicators related to health and education are presented in Table 5.2. While the number of physicians per 1,000 people describes the availability of health services, the remaining health indicators provide information on the state of the health of the population. A particularly important indicator is the prevalence of child malnutrition which is deeply related to extreme poverty. Malnutrition in children is caused by inadequate caloric consumption and by diets that lack essential nutrients. Chronic undernourishment is at the beginning of a vicious cycle of ill health, reduced learning capacity and poor physical growth. In a number of African countries the prevalence of child malnutrition is still in the range of 20-50 %. As poverty declines with increasing income, children become better nourished and healthier.

Because education improves people's ability to break out of the cycle of poverty, indicators of education efficiency and outcomes, such as adult illiteracy rate, primary completion rate and average years of schooling are important. Moreover, population data are added to quantify the size of the human assets available at the national and community level, including data on women and children in the labor force.

Table 5.2.: Human capital indicators

National level	Community level
Population <ul style="list-style-type: none"> • Total population [millions] • Females as percentage of labor force [%] • Children 10-14 in labor force [% of age group] Health <ul style="list-style-type: none"> • Physicians [per 1,000 people] • Life expectancy at birth [years] • Under-five mortality rate [per 1,000] • Prevalence of child malnutrition [% of children under 5] • Prevalence of HIV [% of adults] <ul style="list-style-type: none"> ○ Male ○ Female Education <ul style="list-style-type: none"> • Adult illiteracy rate [% ages 15 and over] <ul style="list-style-type: none"> ○ Male ○ Female • Primary completion rate [% of all children who complete primary school] <ul style="list-style-type: none"> ○ Male ○ Female • Average years of schooling <ul style="list-style-type: none"> ○ Male ○ Female 	Population and labor force <ul style="list-style-type: none"> • Total population of target area • ASM population in target area • Share of ASM population in target area [%] • Share of migrants in ASM population [%] • Females as percentage of labor force [%] • Children 10-14 in labor force [% of age group] • Children < 10 in labor force [% of age group] Health <ul style="list-style-type: none"> • Physicians [per 1,000 people] • Life expectancy at birth [years] • Under-five mortality rate [per 1,000] • Prevalence of child malnutrition [% of children under 5] • Prevalence of HIV [% of adults] <ul style="list-style-type: none"> ○ Male ○ Female Education [male, female] <ul style="list-style-type: none"> • Adult illiteracy rate [% ages 15 and over] • Primary completion rate [% of all children who complete primary school] • Average years of schooling

5.3.2.3 Financial capital

Financial capital comprises earned income and accumulated savings in cash, bank deposits or other liquid assets, and goods such as cattle or jewelry. Financial resources are particularly important as they allow the most direct and immediate achievement of livelihood outcomes, such as the purchase of food or other basic consumer goods.

Financial capital indicators proposed for baseline surveys are reported in Table 5.3. At the national level the principal indicators which describe the extent of poverty and thus the lack of financial assets should be applied, including the rural and urban poverty rate, as well as population below 1\$ and 2\$ a day. Gross national income per capita and PPP gross national income per capita are important measures of economic performance and overall productivity which should be recorded. Interest rates provide information on potential income from cash savings and the cost of loans.

At the community level important financial capital indicators are average household income and average cash household expenditures per period. A powerful measure in assessing the vulnerability of a household is the share of the cash food budget in household income. A high share of, for example, 70 % indicates that little money is left for other needs, such as health, education, transport and other services, and that this household is highly vulnerable. Additional measures of financial capital at this level are the share of households with savings in cash assets and the household savings rate.

Table 5.3.: Financial capital indicators

National level	Community level
Poverty <ul style="list-style-type: none"> • Rural poverty rate [%] • Urban poverty rate [%] • Population below 1\$ a day [%] • Population below 2\$ a day [%] Income <ul style="list-style-type: none"> • Gross national income per capita [US\$] • PPP gross national income per capita [US\$] Interest rates <ul style="list-style-type: none"> • Deposit [%] • Lending [%] 	Income <ul style="list-style-type: none"> • Average household cash income from paid work [US\$/month or year] • Average household non-cash income from food production [US\$/month or year] • Number of persons per household • Total average income per person [US\$/person/year] Expenditures <ul style="list-style-type: none"> • Average household cash expenditures for food [US\$/month or year] • Average household cash expenditures for non-food [US\$/month or year] • Total average household cash expenditures [US\$/month or year] • Share of cash food budget in household income [%] Savings <ul style="list-style-type: none"> • Share of households owning savings in cash assets [%] • Value of savings in culturally relevant assets (e.g. cattle, jewelry) • Household savings rate [%]

5.3.2.4 Social capital

Social capital indicators recommended for baseline work are reported in Table 5.4. Both for individuals and households social assets primarily mean the membership in a formal social security system or in a social network at the community level. Measures like public expenditures on pensions and on health provide information on the extent of the social security net at the national level. While in many high income countries public expenditures on pensions exceed 10 % of GDP, this share is less than 1 % in most African countries.

At the community level, indicators on the participation of people in the social security system and in occupation-based associations or community-based social assistance groups are used to measure social assets. The number of violent offenses and property-related offenses should be included to enable the assessment of public safety.

Data on female and children participation in the labor force should be collected to describe the situation of social groups that are usually the most vulnerable in the society. In many of the low income economies between 20 % and 40 % of children in the age group 10 to 14 have to work, thereby missing valuable years of education. These are included in the human capital category.

Table 5.4.: Social capital indicators

National level	Community level
<p>Social security</p> <ul style="list-style-type: none"> Public expenditures on pensions [% of GDP] Average pension [% of per capita income] Public expenditures on health [% of GDP] <p>Public safety</p> <ul style="list-style-type: none"> Violent offenses [number per year per 100,000 population] Property-related offenses [number per year per 100,000 population] 	<p>Social security</p> <p>Participation in formal safety net</p> <ul style="list-style-type: none"> People with health insurance [%] People entitled to unemployment benefits [%] People entitled to receive pensions [%] Average pension [% of per capita income] <p>Social networks</p> <p>Share of people with links to</p> <ul style="list-style-type: none"> Occupation-based associations [%] Community-based social assistance groups [%] Informal savings and credit groups [%] <p>Public safety</p> <ul style="list-style-type: none"> Violent offenses [number per year per 100,000 population] Property-related offenses [number per year per 100,000 population]

5.3.2.5 Physical capital

Physical assets comprise all types of basic infrastructure required to support livelihoods, including housing, transport, telecommunication, schools, hospitals, electricity, water and sanitation facilities. Physical capital indicators to be applied in profiling work are compiled in Table 5.5.

Both at the national and the community level, the number of hospital beds and the percentage of the population with access to improved water source and to improved sanitation facilities are included to measure the availability of basic infrastructure. At the national level, the share of households with access to potable water, with sewerage connection with electricity and telephone, as well as data on the number of passenger cars, two-wheelers, radios and television sets are used as additional indicators of infrastructural development.

Similarly, at the community level information is required on the share of households owning a home, the size of the home, the availability of piped water, sewerage connection, electricity and telephone. In addition, data on the ownership of transport vehicles and consumer durables, such as radios, television sets and refrigerators, are indicative of the availability of physical assets at this level and should, therefore, be recorded.

Table 5.5.: Physical capital indicators

National level	Community level
Population access to services <ul style="list-style-type: none"> • Hospital beds [per 1,000 people] • Access to improved water source [% of population] • Access to improved sanitation facilities [% of population] Households with access to services <ul style="list-style-type: none"> • Access to potable water [%] • Sewerage connection [%] • Electricity [%] • Telephone [%] Transport and information assets <ul style="list-style-type: none"> • Passenger cars [per 1,000 people] • Two-wheelers [per 1,000 people] • Radios [per 1,000 people] • Television [per 1,000 people] 	Population access to services <ul style="list-style-type: none"> • Hospital beds [per 1,000 people] • Access to improved water source [% of population] • Access to improved sanitation facilities [% of population] Ownership of assets: <ul style="list-style-type: none"> • Share of households owning home [%] <ul style="list-style-type: none"> ○ Average size of home [m²] ○ With piped water in house [%] ○ With sewerage connection [%] ○ With electricity [%] ○ With telephone [%] • Share of households owning <ul style="list-style-type: none"> ○ Passenger cars [%] ○ Two-wheelers [%] ○ Motor boat [%] • Share of households owning <ul style="list-style-type: none"> ○ Radio [%] ○ Television [%] ○ Refrigerator [%]

5.3.3 ASM operation level indicators

At the ASM operation level, a number of indicators on the sub-sector structure and on institutional performance are included in addition to those related to the asset pentagon of natural, human, financial social, and physical capital. Indicators at this level recommended for profiling studies are presented in Table 5.6.

Table 5.6.: ASM operation level

<p>ASM sub-sector size and structure</p> <ul style="list-style-type: none"> • Mineral production by ASM [time-series] • Total production units in target area • Average number of workers per production unit [number] • Share of production units organized as <ul style="list-style-type: none"> ○ Ad hoc groups [%] ○ Single proprietorship firms [%] ○ Co-operatives [%] ○ Partnerships [%] <p>Institutional performance</p> <ul style="list-style-type: none"> • Average duration of licensing process [weeks] • Licensing costs [US\$/licence] • Number of pending licence applications • Mine site inspections [number/year] • Number of conflicts between [per year] <ul style="list-style-type: none"> ○ ASM and large-scale mines ○ ASM and communities <p><i>Natural assets</i></p> <p>Mining rights:</p> <ul style="list-style-type: none"> • Share of production units with mining licence [%] • Share of production units with proved mineral reserves [%] <p>Environmental effects:</p> <ul style="list-style-type: none"> • Area affected by ASM in target area [hectares] • Annual land degradation by ASM [hectares/year] • Annual land rehabilitation by ASM [hectares/year] • Use of mercury in ASM [kg/year] 	<p><i>Human capital</i></p> <p>Health:</p> <ul style="list-style-type: none"> • Lost workdays of ASM due to illness [days] • Lost days of other ASM household members due to own or child illness [days] <p>Mine safety:</p> <ul style="list-style-type: none"> • Protective equipment [US\$ book value/production unit] • Number of lethal accidents [per ASM district] • Lost workdays due to mine accidents [days/year/capita] <p><i>Financial capital</i></p> <p>Income</p> <ul style="list-style-type: none"> • Average income from mining [US\$/month or year] <ul style="list-style-type: none"> ○ Mine worker ○ Gang leader / shift boss ○ Licence holder ○ Property owner <p>Access to credit</p> <ul style="list-style-type: none"> • Share of production units with bank loan [%] <p><i>Social capital</i></p> <ul style="list-style-type: none"> • Share of miners with membership in ASM association [%] • Share of miners with membership in labor union [%] <p><i>Physical capital</i></p> <p>Mine assets owned per production unit:</p> <ul style="list-style-type: none"> • Mining equipment [US\$ per production unit] • Processing equipment [US\$ per production unit] • Transport equipment [US\$ per production unit] <p>Operational efficiency:</p> <ul style="list-style-type: none"> • Labor productivity [units product/day worked] • Mineral recovery [%]
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Mineral production by ASM, total number of production units, average number of workers per unit and shares of different types of organizations are used to portray the size and structure of the ASM sub-sector to be profiled. Data on the duration of the licensing process, on licensing costs, the number of pending licences, the number of mine site inspections and the incidence of conflicts

between ASM and large-scale mines or communities provide evidence of the effectiveness of the mining authority responsible to control and support the activity.

Indicators of natural capital have to provide information on the share of licensed operators as opposed to informal ones, on the knowledge of mineral reserves, as well as on the environmental performance of the activity, notably on the land area affected by ASM, annual land degradation and rehabilitation, as well as on the use of mercury.

Additional human capital indicators to be monitored at the ASM operation level include lost workdays due to illness and mine accidents, number of lethal accidents, and the value of protective equipment used at the mine sites. Information on average net income from mining and access to credit is indicative of the financial resources the activity generates or that are available for investment, respectively. Supplementary social capital measures at this level have to denote the extent to which miners have links to ASM associations and labor unions.

Data on the value of the mining, processing and transport equipment owned per production unit are required for an assessment of the physical capital employed by the sub-sector. The two indicators of operational efficiency, labor productivity and mineral recovery, are particularly valuable as they demonstrate the income earning potential of the activity.

5.4 Methodological guidelines

5.4.1 Barriers

We distinguish barriers to collecting valid and reliable information in field work, and barriers that disallow for generalization of data collected in ASM communities²³.

5.4.1.1 Data validity and reliability

- Informality and illegality make that ASM populations and activities are poorly documented and, typically, not recorded in a consistent matter over time.
- Qualified consultants are sparse. Local people may not have the type of skills to collect the kind of data and write the type of report an international agency is looking for. Short-term foreign consultants may not have adequate understanding of local (mining) cultures.
- People may give false or incomplete information because:
 - Fatigue of researchers and research projects that do not bring change
 - Secrecy because of (semi)illegality
 - Mistrust of researchers, international agencies, and public officials who conduct, commission and endorse the study. What will happen with the information? (noted in Cameroon 1998)
 - People may not know the answer. For example, households that receive income from multiple, changing and variable sources may not be able to estimate annual household income
 - Miners may not know the answers because there is usually no track-record on production, sales, inputs, quality of ore, etc. and there is a tendency of overestimating these data when looking backwards.
 - Questions are not relevant to daily life experiences
 - People may hide earnings to prevent payment of taxes and fees to others
 - People may hide earnings out of fear of being robbed
 - Limited funding and resources limits the time dedicated to data collection (Ethiopia, 2002; MMSD study on SADC Region, 2001).

Recommendation 1

Researchers as well as the agency(s) commissioning and funding the study should dedicate a considerable amount of time and money to building relationships of trust between the data collectors and the community.

Recommendation 2

Compile a consulting team with international, national, and local consultants. Local consultants can be community leaders or students with long-term experience in the field site, who speak the local language, and understand local cultural codes. If no qualified local people are available, a more experienced outside consultant can contribute to local capacity building by training local consultants.

²³ These barriers were identified during the working session on Microeconomics, September 6-7, 2003, which was part of the CASM annual meeting in Accra, Ghana.

Recommendation 3

Respect international standards for working with human subjects. These standards are available from the website of most universities as well as from the American Anthropological Association. These guidelines include being clear and explicit about project goals and informing potential study participants about their rights, possible harm, and benefits from participation.

5.4.1.2 Generalization of data across time and space.

- Mining populations are composed of diverse groups, including men, women and children; migrants and locals; gold rush, seasonal, and permanent workers; formal and informal miners.
- Population of miners is continuously shifting in size, make-up, and location.
- The microeconomic context of ASM is shaped by cultural values, beliefs and practices, that change over time and differ from place to place. For example, in some areas women are banned from entering a mine shaft. What constitutes poverty and wealth is also culturally determined.
- Within the household, ASM is typically embedded in a range of income-generating activities. ASM may support other activities and income from other sources may be used to invest in mining equipment.

Recommendation 4

Adjust the study design to the special and difficult conditions in ASM areas. The location and spread of the mining population as well as safety concerns may limit data collection. Discuss such limitations in the study.

Recommendation 5

Carefully define your target population and based thereupon a sampling strategy and survey design. There are seven major kinds of samples. “Three of them –simple random, stratified random, and cluster samples– are based on the principles of probability theory. The other four –quota, purposive, snowball, and haphazard samples– are not.” (Bernard 1995: 73. Sampling strategies are explained in more detail in Bernard 1995, Ch. 4)

For example, if the sample population consists of all households in one particular community, one may take a simple random sample by interviewing each third or Nth household one encounters, or by numbering all households and drawing the required number of households from a hat. If the purpose of the research is to understand mine safety, one may want to use purposive or judgment sampling to find mine operators and people who have experienced accidents. In judgment sampling you decide the purpose you want an informant, household, or community to serve and you go out to find one.

5.4.2 Methodological guidelines based on the sustainable livelihoods approach

The tool-kit presented in this report is based upon the Department For International Development’s (DFID) *Sustainable Livelihoods Guidance Sheets*. The word ‘livelihood’ can be used in many different ways. The following definition captures the broad notion of livelihoods understood here:

A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance

its capabilities and assets both now and in the future, while not undermining the natural resource base.

Adapted from Chambers, R. and G. Conway (1992) Sustainable rural livelihoods: Practical concepts for the 21st century. IDS Discussion Paper 296. Brighton: IDS.

Promoting more sustainable livelihoods is one route towards meeting the International Development Target of reducing by one-half the proportion of people living in extreme poverty by 2015. In this context, the aim of DFID's framework is to:

...provide a way of thinking about the livelihoods of poor people that will stimulate debate and reflection, thereby improving performance in poverty reduction. In its simplest form, the framework views people as operating in a context of vulnerability. Within this context, they have access to certain assets or poverty reducing factors. These gain their meaning and value through the prevailing social, institutional and organisational environment. This environment also influences the livelihood strategies – ways of combining and using assets – that are open to people in pursuit of beneficial livelihood outcomes that meet their own livelihood objectives. (DFID web site, URL: www.livelihoods.org/info/info_guidancesheets.html)

Livelihood, then, is a broad concept that encompasses virtually all aspects of daily life. Broadly, these aspects can be organized in five distinct categories of physical, natural, social, human, and financial capital. Throughout this report and in the tool kit we will refer to these five categories (see sections on check-list and indicators).

The below listed methodological guidelines for collection of data are inspired by the Sustainable Livelihoods Guidance Sheets developed by the Department For International Development (DFID). Table 5.7. lists methodologies that are appropriate for the collection of certain types of data.

The table lists methods that are suitable for the collection of different types of data (shaded areas). Diagonally striped areas suggest the most appropriate method to collect information about a general type of capital, taking into consideration that all methods can generate information about each capital type. In addition to data-type, methods selection is guided by the availability of time and money, skills and experience of the research team, specific study objectives, and the desired level of detail. The table suggests that key informants and village surveys are most useful for baseline studies. Due to their high demands in time, money, and skills, household surveys and participatory methods do not suit the purposes of most baseline work.

Table 5.7. What methods may be most appropriate?

	Secondary data	Key informants	Participatory methods	Household surveys	Village surveys	Focus groups	Quantitative	Qualitative
Natural capital								
Available assets								
Vulnerabilities								
Structures and processes								
Social capital								
Available assets								
Vulnerabilities								
Structures and processes								
Financial capital								
Available assets								
Vulnerabilities								
Structures and processes								
Human capital								
Available assets								
Vulnerabilities								
Structures and processes								
Physical capital								
Available assets								
Vulnerabilities								
Structures and processes								

5.4.2.1 Sources of secondary information

Secondary data consist of information and (aggregated) statistics that have been collected and recorded by others. Secondary data are found in reports, statistical yearbooks, and published and unpublished documents from governments, non-governmental organizations, and international institutions. Table 5.8. lists key sources of secondary information relevant to ASM baseline studies.

Data from international institutions can usually be downloaded from their web sites. Local and regional level data are often more difficult to find, if they exist at all. In many cases national or lower level statistics related to ASM (a) do not exist, (b) are inaccurate, and (c) are lost or dislocated (Madagascar 2001/2001, Mali 2001, Zambia 2002). Furthermore, government personnel may not readily release information, even when it concerns information that should be publicly available. One baseline study noted that “When found, even official documents frequently required payment.”

Table 5.8. Sources of secondary information.

Level	Institution	Type of data/ Name of publication
Int'l	See section 4.5.	See section 4.5.
Country	National bureau of statistics Public/national department of mining and geology Central Bank & other national gold buying agents	Statistical yearbook (annually) Mining laws, (estimated) numbers of legal and illegal miners, gold production. Declared gold production and estimated undeclared gold production
Regional	National bureau of statistics Regional government	Some institutions can, upon request and for a small fee, provide disaggregated data for a specific region Quantitative and qualitative data on the context of mining in the region, environmental problems, regional wages, crime, and other indicators
Local	Local clinic Local school Local government	Frequency of (reported) disease and accidents School attendance and educational achievement (quantitative or qualitative) Local governance and decision-making structures

Recommendation 6

Cross-check national statistical data with data and qualitative observations from local Non Governmental Organizations and international organizations including the World Bank, the International Monetary Fund, the United Nations, the International Labour Organization, and the World Health Organization.

Recommendation 7

Obtain a letter from the highest possible government authority stating its support for the baseline study, and report irregularities to this authority.

5.4.2.2 Key informants

Key informants are individuals selected for their specialized knowledge about a topic of interest. Walking around an ASM site with a key informant is an effective, fast, and cheap method to gain general understanding of local socioeconomic, political, and environmental conditions. Good key informants can often be found by asking around in the community for the expert on a certain topic. They are:

- Reliable, that is, they provide information that is accurate.
- Communicative and open to sharing information with outsiders.
- Not contentious in the community.
- Representative -to the extent possible- of the heterogeneity in the community. Key informants should include members from powerful and marginal groups, men and women, and miners and non-miners.

Recommendation 8

Work with carefully selected key informants. Information provided by one key-informant should be cross-checked with a second and preferably third person. Data validation needs to happen discretely it may be considered a sign of distrust.

5.4.2.3 Participatory methods

Participatory research involves community members in (a) development of the research design, including a set of meaningful questions, and (b) the analysis and evaluation of results. Several participatory methods are useful to ASM baseline research.

a. Stakeholder analysis

Stakeholders are people or groups of people who are directly or indirectly affected by, or have the power to affect, an event or situation. A stakeholder analysis lists these people, usually in a table. Additional information in this table depends on the study purpose and can include relative power to affect decisions; ways of being affected by the event; relations with other stakeholders; and access to assets and resources.

b. Seasonal calendars

Seasonal calendars provide a visual representation of the different activities performed by different population groups at different times of the year. They can be represented as an annual cycle, as a time line, or in any other way that suits the purposes of the researcher.

c. (Gendered) resource mapping

Resource maps provide a simplified map of the target site with the location of different types of natural, human, and/or other resources. These maps can show who has access to, and control over, the resources in question. In gendered resource mapping, symbols for men and women visually show the gender division of resources.

Recommendation 9

Real participatory research requires a lot of time, experience with the community, and expertise on part of the researcher. The researcher should carefully consider whether participatory research fits within the aims and scope of the baseline study.

Recommendation 10

The agency commissioning the study should reserve room in its budget for sharing formal results (e.g. final report) as well as informal research results (e.g. photographs) with the community. A return visit allows community members to ask questions about the data and its implications, and provides the researchers with an opportunity to elicit feedback, verify findings, and correct errors in the final report.

5.4.2.4 Household surveys

A household survey is a list of, mostly closed-ended, questions that are asked to all or a representative sample of households in a certain village or region. The typical household survey asks about household demographics and economics in addition to the specific study subject, and lasts between 30-60 minutes per household. Researchers have also used surveys to assess local

knowledge, attitudes, and awareness about a certain topic, such as mining impacts. Household data can be presented in the form of summary statistics to characterize the sample population. In addition, they can be used to test relationships between variables of interest such as participation in small-scale gold mining and indicators of wealth and health.

Well-designed household surveys provide a wealth of information about livelihoods that can be a basis for policy decisions. Moreover, they can be duplicated –often with minor adjustments– in different areas and over time, which allows for documentation of spatial variation and changes over time. On the down side, developing good questions; designing an effective survey protocol; collecting valid and reliable answers; recording answers rapidly yet securely; and, ultimately, analyzing and presenting data in a meaningful way require a lot of time and practice.

Recommendation 11

Only use household surveys if you can reserve and dedicate sufficient time to:

- Identify, collect, and analyze relevant secondary and qualitative data (2 weeks)
- Devise survey forms (1 week);
- Pre-test surveys in the field and train local assistants (2 weeks)
- Undertake the household survey with assistants (1-4 weeks)
- Enter and clean data (2-3 weeks)
- Analyze data and write-up results (4-6 weeks)

TOTAL: 3-4 month

Recommendation 12

Employ someone with prior experience conducting household surveys to supervise, develop, and conduct survey work. Prior research experience or familiarity of this person with the target area can significantly decrease time requirements and improve the quality of data collected. Select, train, and evaluate local survey assistants

5.4.2.5 Village surveys

A village survey is a list of questions meant to characterize the community. Questions usually are closed-ended and quantitative. Nevertheless it is valuable to leave open space to record qualitative observations. They ask about community infrastructure (e.g. number of houses, access to clean drinking water and electricity), public services (e.g. presence of, or distance to, a school and health care facilities), indicators of wealth (e.g. number of TVs), indicators of income (e.g. the amount of certain products bought in local stores), sanitary facilities (e.g. type of sewerage system), and economic activities (e.g. number of stores), among other things. If relevant to the study subject, the surveyor may also record (qualitatively) the type of governance and cultural practices. Village surveys for mining communities should ask about the quantity and quality of mining equipment present, and about region-specific indicators of village dependency on mining. A village survey for a mining baseline study should include sections that represent all five livelihood categories and treat mining households as a distinct group in the community. It also should include measures of village dependency on mining and other mining-related indicators. It is advisable to use a previously developed and tested recording sheet ANNEX V that captures all relevant information. ANNEX VII provides a blue-print for such a recording sheet includes an example village survey.

A combination of focus group interviews, key informant interviews, personal observations and measurements, and institutional records should provide most village-level data. In the ideal case, information about the community has been collected by the national census or other public services. This information is likely to be stored in a regional or community administrative center. If accurate secondary data are not available, the following strategies may be taken (referring to ANNEX VII):

Section A. General. In smaller communities, a good approximation of the numbers of inhabitants, miners, structures, and inhabited houses may be obtained by tallying each house on a walk through the community with a key informant. Often even school-aged children will be able to tell about each house who lives in it. Marking each counted houses with chalk will reduce the chances of counting houses twice. This tour will also familiarize the researcher with community life and lay-out, and allow him or her to record data about its infrastructure, such as the number of clinics and churches. Larger communities may be divided into several segments that are surveyed by a couple of day-assistants.

Section B. Natural capital. Some of this information, such as the share of households owning cattle, may be obtained by the village-tour, as described under A. To obtain reliable estimates of the average size of agricultural plots or cattle herds, one would need to conduct a household survey. If the time and money to do so are not available, one may obtain good approximations from focus groups with members from the relevant group (e.g. cattle or land holders). One can begin by asking the group how much cattle (land) the poorest and the wealthiest cattle (land)-holders in the community have. Next one can ask about cattle (land) ownership for an average or typical individual in the community. Rather than aiming for an absolute number, it may be fruitful to search for the range within which this individual would fall. Most other data can be obtained from key informants. These data include the types of mineral resources and deposits exploited by small-scale miners, and the number of individuals owning mines.

Section C. Social capital. Information on the number of community organizations, political representation, and decision making culture are best obtained from key-informants. For data on membership of specific organizations, participation in social activities, and enrolment in insurance plans, one can ask representatives from the organizations concerned. For example, a clinic administrator may have on record who has health insurance. One could obtain similar information from a household survey of the entire community or a representative sample. This latter method would likely take more time, money, and effort. Data on numbers of women and children involved in mining will be most difficult to obtain, especially if the issue is sensitive (as with child labor). If the populations are not too large, key informant could provide good estimates. Where possible, the researcher should verify the information with three or more people and personal observations.

Section D. Financial capital. Focus groups with relevant occupational group can provide good estimates of typical and ranges of incomes. Calculating average incomes is not easy. A survey among a representative sample of miners may be the best approach. Survey-work among miners will be difficult, however, especially where miners work at some distance from the community and spread out over a large area. Its transitory and mobile nature forms another barrier to selecting and interviewing a representative sample from a mining population. Furthermore, income from non-mining activities, the value of home food production, and household expenditures are typically variable, irregular, and unrecorded. Where it is unlikely that a rapid household survey will provide reliable estimates, focus groups may be the best alternative. For the sake of comparability, one should express all currency items in both US dollars and the local currency. More general

information such as the number of motorized mining machines and mining-related businesses in the community may be obtained from a key informant.

Section E. Human capital. Key informants should be able to provide distances and travel times to relevant institutions (school, clinic). If travel times depend on seasonality or mode of transport, one should give the range rather than an absolute value. Key informants also may be consulted for information on the presence of traditional healers and religious shrines. Educational indicators (e.g. primary school enrolment, numbers of teachers and pupils) can usually be obtained from the nearest school or regional administrative office. A local clinic should be able to provide most community-level health indicators. Household surveys may provide the most accurate figure on the share of families eating at least two meals a day. Focus groups or key informants (including one working with the local clinic) are a cheaper alternative that may generate a good approximation.

Section F. Physical capital. In small-scale rural communities where people construct their own homes, it is not uncommon that (almost) all families own their homes. In other places one may obtain this information through household interviews or else a good approximation through focus groups. One can estimate average house surface by measuring the length and width of a random sample of houses (e.g. every third or fourth house). The researcher should for each of these houses also record key features of the construction materials. Data on ownership of transport vehicles, consumer durables, and a phone, as well as access to the public electricity net, can be found through household surveys. One can ask a key informant about other infrastructural indicators, such as access to roads, the presence of stores, and the type of waste management/sewage system. Local miners should be able to provide information on ownership and prices of mining equipment.

Again, it is important that the researcher or his/her assistants are familiar with the research area. They should select and adapt the different methods to develop a research design that fits their specific needs PRIOR to going into the field.

Recommendation 13

Village surveys are generally more suitable for baseline studies than household surveys. They are faster and cheaper because the researcher can collect most village-level data based upon own observations and information from a few key-informants.

5.4.2.6 Focus groups

Focus groups are facilitated group meetings aimed at collecting qualitative data about a topic of interest through discussion among participants. Focus groups typically last between one to two hours, and are often conducted separately for specific interest groups (e.g. women and men, older and younger people). The researcher should be familiar with the group culture, topic, and facilitation techniques. Discussion among participants will allow the researchers to (a) collect qualitative data on perceptions of and attitudes towards the topic of interest, (b) document the most pressing concerns, (c) record popular (mining-related) myths and stories, and (d) identify sources of agreement, disagreement, and contention within the community.

Recommendation 14

Consider collecting community-level data through focus group discussions in particular for data on perceptions, knowledge, and attitudes. This method is relatively low time and cost intensive, provides a wealth of information, and will be a solid basis for survey development.

Recommendation 15

Avoid taking part in the discussion or revealing your personal opinion. Participants may try to explore the researcher's point of view in order to tell the researcher what they suppose he/she likes to hear. This is especially important in case of baseline surveys carried out by Development Agencies or Programs due to inherent expectations.

5.4.2.7 Quantitative and qualitative data

Understanding the complex working and family lives of artisanal and small-scale miners requires integration of qualitative and quantitative data. The aim of *qualitative data* is to generate an accurate, detailed interpretation of a research question. Qualitative data are collected through (participant) observation, open-ended questions, oral histories, free-listing, and other techniques that do not seek to establish absolute values for the researched items. *Quantitative data* seek to establish absolute levels or values on things, by counting or by rank-ordering into categories.

Quantitative and qualitative data build upon one another, and their interactive use benefits both. Qualitative information can improve the design of survey questions for the collection of numeric data. Quantitative data, in turn, can reveal differences between households and relations between variables that can be further investigated and explained through qualitative techniques. Depending on the aims and scope of a study, the researcher can give priority to one type of data over the other. Table 5.9. lists strengths and weaknesses of both.

Recommendation 16

Integrate qualitative and quantitative data

Table 5.9. Strengths and weaknesses of quantitative and qualitative data

Data	Strengths	Weaknesses
Qualitative	<ul style="list-style-type: none"> ➤ Provides contextual understanding that can be used for further (quantitative) data collection ➤ Can be relatively quick and low-cost ➤ Exposes heterogeneity in people, living conditions, and interests in the sample population. ➤ Reveals social relations and processes ➤ Reveals sources of vulnerability and coping mechanisms ➤ Explains numeric results 	<ul style="list-style-type: none"> ➤ More prone to bias in interpretation, which can change with the informant, the researcher, and the relation between the two ➤ Can be difficult to compare across sites and over time. ➤ Lengthy and detailed stories and explanations are unsuitable for policy recommendations ➤ Difficult to generalize from the sample data to the population at large
Quantitative	<ul style="list-style-type: none"> ➤ Can infer population characteristics from a small sample (but only if that sample was taken randomly). ➤ Tests and verifies the significance of qualitative findings ➤ Relatively easy to compare data across time and space. ➤ Can be presented in a brief, concrete and systematic fashion that is attractive to policy makers 	<ul style="list-style-type: none"> ➤ Concreteness can mislead, that is, numbers may give false sense of accuracy ➤ Tendency to collect too much data and to produce over-complex analyses. ➤ Can be time consuming and expensive ➤ Can provide evidence for differences between households or communities, but not explain the causes or consequences of these observed differences.

5.4.2.8 Interdisciplinary cooperation

Characterization of ASM in a context of poverty eradication and sustainable livelihoods requires understanding and documentation of technical, socioeconomic, cultural, political, legal, and environmental issues and processes. It is unlikely that one person or one discipline has expertise in all areas. Some baseline studies did make use of interdisciplinary teams (e.g. Tanzania 1996 and 1997; Ghana 2002), while others were conducted by individuals (e.g. Tanzania 1993, Ghana 2001).

Recommendation 17

Baseline studies should be conducted by interdisciplinary teams that contain members from both the social sciences (anthropology, economics) and the natural sciences (ecology, engineering).

5.4.2.9 Control groups

Few baseline studies make use of control groups. It is useful to know how the mining community compares to surrounding communities in terms of incomes, standard of living, sanitation and health, educational achievement, and other indicators.

Recommendation 18

Collect key indicator values for communities that do not obtain incomes from mining, but otherwise resemble the target ASM community(s). If time and financial constraints limit rigorous data collection in control communities, it will still be valuable to qualitatively assess how ASM communities compare to nearby non-mining communities.

5.4.3 Data recording, compilation and reporting formats

5.4.3.1 Data recording and compilation

When developing a system to record data, the following concerns have priority: reliability, relative ease of recording, validity, and security. *Reliability* refers to whether one gets the same answer by using an instrument to measure something more than once. It requires that information about different villages or households, and information collected by different researchers, is recorded according to the same principles and in the same format. A few guidelines can help:

Recommendations to improve reliability of data recording (19)

- Select appropriate units, scales, codes, and categories prior to data collection. Make sure that all data collectors know about, and are trained in the use of, these standards.
- Use scales rather than real values where values are likely to be inaccurate. For example, income can be recorded in about 5 relevant scales (0-200, 200-500, 500-1000, etc...) rather than aiming for an exact value.
- Record local prices for a few selected items and wages as well as exchange rates in each village (see sample questionnaire).
- List locally used units for weights and volumes. Convert these units to standard metric units. For example, 1 barrel of oil is 200 liter; 1 bag of rice is 25 kg.

Ease means that data recording is straightforward and can be done rapidly. As an interviewer, you want to concentrate on your conversation partner. You do not want to be bent over a notebook scribbling down lengthy answers on standard questions. It is recommended that the data recorder:

Recommendations to improve ease of data recording (20)

- Uses a standard survey form with questions that ask for relatively short and straightforward answers that can be circled or recorded in writing (see ANNEX VI).
- Develops codes for answers that are anticipated. For example, instead of writing down a migrant's region of origin, one can code all relevant provinces 1,2...n.

Data *validity* refers to the accurateness and trustworthiness of the data.

The data recorder can guard data validity by taking detailed field notes and a log for the duration of the research²⁴. Because human memory is a poor recording device, it is advisable to keep a field book in hand at all times to make field jottings and notes on the spot. This applies to both formal and informal interviews that the researcher conducts with people in and around mines, in bars and restaurants, and on the street. One should be sensitive to feelings of the people around you about recording. A log is a running account of how you plan to spend your time, how you actually spend your time, and how much money you spent. It will help one recall where certain pieces of information came from, and how gaps in data can be explained.

Recommendation to improve validity of data recording (21)

Keep a detailed field notes and a log

²⁴ A detailed description on keeping notes, diaries, and logs in the field can be found in H.R. Bernard (1995) Research methods in anthropology. Qualitative and quantitative approaches. (second edition). Walnut Creek, CA: AltaMira Press

Security means that data will not be lost.

Recommendations to improve security of data recording (22)

- Anticipate climatic events, animals, and other factors that may destroy your recordings. For example, in a humid climate one may want to use waterproof notebooks, and store materials in zip-lock bags or other waterproof storage devices.
- It may appear obvious, but always back up files. Where there are no ways to use a computer or make photocopies, it may be possible to record new findings on a cassette-tape in addition to keeping a written record.

Quantitative data, notably benchmark indicators, should preferably be compiled in electronic format using standard spreadsheet software (e.g. MS Excel) to facilitate computing statistical measures, such as mean values of communities, number sampled, etc. Moreover, time-series data on benchmark indicators compiled in spreadsheet software can be effectively displayed in graphical form to show trends of change over time, as well as progress toward objectives.

5.4.3.2 Data reporting

Data reporting should follow international scientific guidelines. Based on the reviews, a few items deserve extra attention.

A. Content

Recommendation 23

Baseline studies should follow a standard, international scientific format for data reporting.

This format would include the following sections.

1. Introduction, including the goal and objectives of the study and a brief lay-out of the report.
2. Methods used to collect and analyse data. If fieldwork was conducted, provide more detail about the sample, interview techniques, and context.
3. Research site, including a description of the country, study area, and specific research sites.
4. Background, which provides a general description of the small-scale and artisanal mining industry and a listing of the problems, as well as an overview of the general context.
5. Data chapters, on Natural, Social, Financial, Human, and Physical capital. This should be the main section of the report.
6. Discussion and conclusions
7. Recommendations

B. Methodological transparency

The majority of evaluated baseline studies discuss neither the methodology used for data collection and analysis, nor sources of information. Few reports clarify to what extent data are representative for the district or sector investigated. In addition, few studies record problems encountered in data collection. Notable exceptions are, among others, the field surveys and interviews documented in the Tanzania baseline studies (1993 & 1996), and a detailed description of the sustainable livelihoods approach that was applied in Ghana 2002. An Appendix with "daily trip notes and photos" in Tanzania 1993 help the reader understand the conditions under which data was collected

and the quality of the data. Methodological transparency allows for verification, learning, and replication of studies over time and space.

Recommendation 24

Explicitly discuss methodology used and list sources from which information was obtained. Also document problems encountered in data collection.

C. Standardization of units

The use of diverse local measurement units for quantitative data is a barrier to the comparison of indicator values in different studies. It is difficult to know how a 1999 mining income of 5000 Fmg earned in Madagascar compares to the income of 5000 CAF francs earned by a Congolese miner in 2002.

Recommendation 25

Consistently use the metric system for measures and convert local currency values to US dollars values.

5.4.4 Sample questionnaires

The design of a questionnaire depends upon the specific purposes of the research, the target population, scale (i.e. individual, household, or community level), available resources (money and skills), and available time, among other concerns. Notwithstanding, a few basic guidelines may improve the quality of survey work.

Recommendations for survey design (26)

- Never develop a questionnaire without conducting prior qualitative research. Even if one chooses for a generic survey format (e.g. ANNEX VII), information obtained from open-ended interviews, focus groups, and observations will shape the language and specifics of the questions.
- The information obtained by questionnaires will tell you more if using scales and values rather than yes/no answers. For example, instead of asking “Does the village have a clinic?” one can record “Distance in travel time (h:min) or km to the nearest clinic”.
- Test the survey prior to data collection. Even the best surveyor cannot know whether the questions developed at home are clear, unambiguous, and inoffensive to the target population. Two, three, or more tests may be needed before a survey gets at answers that have scientific merit, that is, are valid and reliable.
- When targeting individuals, design the quality and quantity of questions as such that the entire survey will not take more than 30-45 minutes time to complete.

Recommendations for survey implementation (27)

- Find out what are the best hours of the day to interview, and reserve those hours for interviewing.

- A good research assistant is an invaluable source of information and support. Hire and train a local research assistant to assist in survey design, provide baseline community information, help with sampling, explain the questions to respondents, and verify and interpret answers.
- As with most work, survey work will gain in quality when performed by someone with prior experience in this field.

A sample questionnaire for a village survey is included in ANNEX VII.

5.5 Links to other useful resources

This section provides information on references and links to useful resources that can assist the researcher in carrying out baseline surveys. References are listed in the three areas of ASM specific research and publications, data sources for benchmark indicators and other quantitative information, as well as methodological guidelines for profiling work. The list of useful resources is summarized in Table 5.10. below.

Among all organizations currently dealing with artisanal and small-scale mining, the multi-donor networking and coordination facility on Communities and Small -Scale Mining (CASM) provides the most comprehensive and extensive knowledge base specific to ASM. CASM maintains a knowledge center that includes a community database, a document database and project database. The community or contact database contains the coordinates of people with interest and expertise in ASM. The bibliographic or document database is a compilation of publications and research papers on artisanal and small-scale mining written within the past 20 years. Many of the documents can be downloaded from an on-line depository. The project database includes general information on ASM projects as well as links to related documentation.

The Mining, Minerals and Sustainable Development (MMSD) project, managed by the International Institute for Environment and Development, carries out research aimed at enhancing the contribution of the mining and minerals sector to sustainable development. As part of this effort MMSD has completed a number of baseline reports on artisanal and small-scale mining in developing countries, including studies on China, India, Indonesia, Papua New Guinea, Philippines, Bolivia, Brazil, Ecuador, Peru, Burkina Faso, Ghana, Mali, as well as a report on the SADC region and a global ASM-study. All the reports are available for downloading at the MMSD website.

The Intermediate Technology Development Group (ITDG) has a long history of assisting small enterprises in developing countries. ITDG's Mining Programme focuses on identifying and introducing more efficient and appropriate mining and mineral processing techniques using affordable locally manufactured equipment and tools. The group maintains resource centres at its regional offices which are open to the public and provide literature and information on appropriate technology in mining and mineral processing.

The Mineral Resources Forum (MRF) managed by the United Nations Conference on Trade and Development (UNCTAD) maintains the MRF Small-Scale Mining subsection which deals specifically with issues related to artisanal and small-scale mining. The main focus is on environmental aspects, health and safety, women and children participation, organizational, technical and financial constraints, as well as regulatory and legal normalization. MRF provides information on news, events, documents and related sites.

The World Development Indicators published annually by the World Bank provide a comprehensive collection of development and poverty-related indicators at the national level that can be used for baseline work. Other important data sources include the United Nations Statistical Yearbook, as well as special statistical publications of UN agencies, notably the International Labour Organization (ILO), the World Health Organization (WHO) and the United Nations Educational, Scientific, and Cultural Organization (UNESCO).

Table 5.10.: References and links

Reference	Useful resources	Links
ASM research		
CASM Communities and Small -Scale Mining	Knowledge center with contact, document and project database on ASM.	www.casmsite.org
MMSD Mining, Minerals and Sustainable Development	Country and regional studies on ASM (downloadable).	www.iied.org/mmsd
ITDG Intermediate Technology Development Group	Projects and research related to ASM, including best practise studies.	www.itdg.org/html/small_scale_miners/small_scale_miners.htm
MRF Mineral Resources Forum (UNCTAD)	Knowledge center with information and links related to small-scale mining.	www.natural-resources.org/minerals/smscalemining/index.htm
Data sources		
The World Bank	World Development Indicators: source of benchmark indicators.	www.worldbank.org
ILO International Labour Organization ILO/AIDS	Labor statistics; safety and health in small-scale mines; Special site dedicated to information on the social and economic impacts of HIV/AIDS, including statistical data.	www.ilo.org www.ilo.org/public/english/protection/trav/aids/
International Monetary Fund	Annual and country reports	www.imf.org/external/pubind.htm
United Nations (UN)	<i>Statistical Yearbook</i> (not online) and various world, regional, and country specific reports,	www.un.org/Pubs/index.html
UNESCO	World Education Indicators; Country profiles.	www.unesco.org
WHO World Health Organization	World Health Report (with statistical annexes) Health indicators and data on specific diseases incl. HIV/AIDS prevalence.	www.who.int www.who.int/country/en/
U.S. Geological Survey Minerals Information	Mineral Commodity Summaries; Minerals Yearbook, including country and commodity chapters.	http://minerals.usgs.gov/minerals/
Methodology		
DFID Department for International Development	Sustainable livelihood guidance sheets: SL approach.	http://www.livelihoods.org/info/info_guidancesheets.html
UNDP	Introduction to SL approach (A guidebook for Field Projects	www.undp.org/sl/documents/documents.htm

The U.S. Geological Survey is a valuable source of mining industry data. The annual publication Mineral Commodity Summaries present information on production, prices, reserves, and events and trends of more than 80 mineral commodities. The Minerals Yearbook is an annual publication that reviews the mineral and material industries of the world. The Yearbook includes chapters on approximately 90 commodities and 175 countries, with statistical data on materials and minerals, as well as information on economic and technical trends and developments.

DFID's Sustainable Livelihood Guidance Sheets offer a comprehensive and detailed collection of instructions for the process of investigating livelihoods for project and policy purposes based on the sustainable livelihood framework, particularly those of the poor. The guidance sheets contain directions on the scope and scale of the analysis, the sequence of work, as well as a description of the methods and common tools suitable for investigating livelihood assets, strategies, outcomes and vulnerabilities. The United Nations Development Programme (UNDP) also provides an introduction to the process of sustainable livelihood analysis, including a guidebook for field projects and related literature.

6. Model terms of reference

6.1 *Introductory remarks*

The objective of the present project is, to develop a proposal for a standard related to contents and minimum data requirements of baseline surveys for profiling artisanal and small-scale mining in Africa. While standardization, based on best practice identified in past country-baseline-surveys, increases the chances that future profiling work will deliver the necessary information, it must not force the researcher into using an inflexible norm, incompatible with the manifold faces of artisanal mining in different countries.

The model terms of reference, therefore, do not repeat or incorporate the toolkit components in a rigid, mandatory way. Instead, they refer to the “toolkit” in the proper sense of the term, i.e. as a set of tools that may be used to get the job properly done. Some tools are inherently obligatory, while the selection and application of others need the experience and criteria of the professional working with them.

On the other hand it is considered necessary that the general layout of the expected product is specified in detail. Just as, for example, when constructing a house, the number of rooms and their use has to be determined, the model terms of reference specify the expected chapters and their content. To stick with that metaphor, the architect of a house needs to be clearly instructed about the purpose of the building; baseline surveys may be required for very different reasons and it is up to the contracting institution to specify the purpose of the baseline study as clear as possible.

Just like construction styles change over time, development strategies are subject to new insights and trends as well; the sustainable livelihood approach is widely considered as current best practice. The model terms of reference, therefore, specify SLA as the methodological framework. The additional requirement of thorough documentation of applied data collection techniques and sources, will allow for a review and reevaluation even under possibly different future development approaches. The apparently strict terms of reference (specifying the expected chapter-layout) can again be compared with construction work: strict definitions of expected outcomes do not impose limits to the creativity of architects; - or consultants in the case of baseline surveys.

As mentioned earlier, thorough profiling requires an interdisciplinary team. Apart from that, it also requires time and resources. Nevertheless time and resources depend widely on the study area. Baseline studies for Nigeria or Malawi, for example, might require very different timeframes and budgets. The model terms of reference, hence do not propose a timeline, although estimates of the time required for thorough profiling typically may vary in a range of 6-8 months for the following phases:

- Project preparation and compilation of secondary data
- Field survey and collection of primary data
- Preparation of draft final report
- Review of draft final report
- Workshop and preparation of final report.

6.2 *Proposal for Terms of Reference*

I. Research Background and Purpose

Artisanal and small-scale mining (ASM) is a widespread phenomenon in the developing world. It is both an opportunity driven and poverty driven activity that offers a means of survival for millions of people in rural areas where job opportunities are scarce. While ASM can reduce poverty and promote sustainable livelihoods, it frequently causes a number of harmful effects, including health and safety hazards, environmental destruction, child labor and community conflicts. This negative impact occurs where ASM is conducted on an ad-hoc and informal basis without the adequate planning and skills, and outside the legal norms governing the extractive industry.

Recognizing the dimension of this problem, multinational organizations, bilateral agencies and national governments have been and still are searching for policies and programs aimed at eliminating the undesirable side-effects of artisanal mining without jeopardizing the income generating opportunities the activity can provide. Designing appropriate policies and programs requires an in-depth knowledge of the ASM sub-sector, including an understanding of the motives, needs and limitations of the people involved in the activity as well as those affected by it. Acquiring this knowledge will necessitate the preparation of a detailed diagnostic study in the form of a baseline survey.

The present baseline survey encompasses the following study area: [*determination and delimitation of the target area on a case by case basis*]

The preparation of the baseline study shall be guided by the vision declared at the UN Seminar on artisanal and small-scale mining in Africa, held in Yaoundé in November 2002, that policies and programs directed towards the sub-sector will contribute to a **sustainable reduction of poverty and improvement in livelihoods in African small-scale and artisanal mining communities by the year 2015.**

The objective of this research effort is to deliver a baseline survey sufficiently comprehensive and accurate to serve as a basis for the formulation of policies and programs required to transform the ASM sub-sector of the study area in line with the Yaoundé vision. This requires the provision of qualitative and quantitative information that

- a) Contributes to a more integral understanding of the cultural, social, economic, political, governance, environmental and technological dynamics of ASM, and its impact or lack thereof on poverty reduction.
- b) Provides a more thorough or relevant basis for designing and implementing programs aimed at reducing poverty and achieving local social, economic and environmental sustainability.
- c) Allows for appropriate monitoring of progress towards poverty reduction and livelihood improvement by measurable indicators.

More specifically, the purpose of the baseline study is to provide all information critical and necessary to know for *[description of the program that requires the baseline study, providing all details necessary for the consultant to elaborate useful recommendations]*

II. Methodological Approach

(a) Because of its special focus on the analysis of the livelihoods of the poor and on improving performance in poverty reduction, the sustainable livelihood approach (SLA) is the underlying framework for the baseline study. The sustainable livelihood guidance sheets developed by the Department for International Development (DFID) provide an introduction to the concepts and tools used in this approach. The SLA examines the livelihood assets natural capital, human capital, financial capital, social capital and physical capital of the target community and how the vulnerability of livelihoods is affected by external shocks, trends and seasonality. It further investigates how government and private sector structures and processes influence livelihood strategies adopted to achieve desirable livelihood outcomes, notably higher income and reduced vulnerability.

(b) The baseline study shall be carried out as a combination of desk research and field surveys. During the desk research secondary information shall be collected from a review of the recent literature on the subject in the study region, and the compilation of relevant statistical data on the national and regional level. Field surveys shall be designed to collect primary information based on direct observation and interviews in a representative number of target communities. In the selection of target sites for field surveys, communities or areas with high intensity ASM activities and a large estimated number of people involved shall be given preference. Attention should also be given to ASM activities and minerals other than the main ones (precious metals and gemstones) which may have the potential to grow and to diversify the sector.

(c) The baseline study shall be carried out by an interdisciplinary team, comprising an appropriate mix of consultants with backgrounds in social sciences, natural sciences and engineering, as well as experience with SLA. Apart from international and national consultants, also local consultants (e.g. community-leaders, local mining associations) shall be included in the team who are familiar with the target community and the study area, speak the local language and understand the local cultural codes.

(d) The baseline study has to provide diagnostic insights into the current status of the ASM activities in the study area, sufficiently detailed to permit the formulation of policies and programs required to transform and strengthen the sub-sector in line with the Yaoundé objectives. To allow the measurement of progress toward these objectives, baseline reports have to include quantitative data that can be used as relevant benchmark indicators. Without such data reliable tracking of change in the ASM sub-sector will not be possible. At the national level adequate indicators are readily available from UN and World Bank annual statistical publications, notably the World Development Indicators. These data shall be complemented by statistical data from national sources. Comparable quantitative data on indicators at the community and ASM operation level shall be collected and/or verified during the field surveys.

(e) All relevant data sources, including pertinent literature references and statistical publications reviewed, key informants, stakeholders interviewed and persons contacted, as well as formats applied or data collection techniques have to be documented in sufficient detail to facilitate the

verification of information presented, an independent technical audit of the baseline report in case of need, or allowing for periodical updates of the survey and tracking of changes towards the development objective over extended periods.

(f) The toolkit attached to the Terms of Reference, comprising (i) a checklist of critical issues and information necessary, (ii) a set of indicators which serve as benchmarks against which progress towards objectives can be measured, and (iii) methodological guidelines and recommendations for carrying out field surveys, shall be applied to the extent possible. If required by the specific conditions of the study area, the checklist issues or the benchmark indicators may be adapted, in order to provide more comprehensive and accurate information.

III. Scope of Work and Research Tasks

According to the methodological guidelines of the attached toolkit, the baseline study shall follow a standard, international scientific format for data reporting. This will comprise the tasks outlined below to be reported in the following sections of the report.

1. Executive Summary
2. Introduction, including the goal and objectives of the study and structure of the report.
3. Methods used to collect and analyze data. *Tasks* include the selection and preparation of the survey instruments, determination of sampling methods, sites and sample size; selection and training of local consultants, as well as validation of the research methodology. For details, see the methodology-section of the toolkit. The main text of the report shall provide a brief summary of the methodology applied, while detailed information shall be provided in the annex.
4. Research site, including a description of the country, study area, and specific research sites. *Tasks:* This part of profiling shall be carried out mainly in form of a desk study, compiling all necessary and critical information that characterizes the context of the study area. For details, see the “General issues checklist” and the “National level Benchmark indicators” of the toolkit. Information on the study area and related to specific research sites shall be complemented with observations made during field work. The body text of the report shall be descriptive and provide a clear understanding of the context using mainly qualitative data, with quantitative information on a need-to-know basis. The complete quantitative profile, comprising all available and applicable indicators proposed in the toolkit, as well as useful additional indicators according to the consultant’s criteria, shall be provided in the annex.
5. Background, which provides a general description of the artisanal mining sector and a listing of the problems. *Tasks:* The general description shall be carried out as combination of desk work compiling and reviewing existing information from related national private and public institutions and interviews of national specialists and key informants. For details see the sections “Definition of ASM” of the checklist, as well as the “ASM sub-sector size and structure” indicators of the “ASM operation level indicators”. For details of necessary and critical information like mining legislation and structure of the mining sector, see the chapter “ASM-specific natural capital” of the checklist. This chapter shall provide a clear description

of the sector-specific background and facilitate (in combination with the previous chapter) all information necessary for understanding the following Data chapter(s).

6. Data chapters, on Natural, Human, Financial, Social, and Physical capital. *Tasks:* This should be the main section of the report and be based mainly on primary data (livelihood assessment) obtained during field work. The “specific issues checklist”, the “community level benchmark indicators” and the “ASM operation level indicators” of the toolkit provide a portfolio of issues to be covered in this chapter. Considering the variety of the ASM sector, the toolkit and the checklist have to be applied in a flexible and site-specific manner: it is the task of the interdisciplinary team to analyze the toolkit (based on the findings from field work) in order to define, which issues are most relevant within the study area, and constitute necessary and critical facts to be reported. The structure of the checklist is not imperative and does not necessarily determine the internal structure of this chapter, if the consultants consider that a modified sequence contributes to a better understanding of the artisanal miner’s livelihoods.
7. Discussion and conclusions. *Tasks:* In addition to the usual discussion of the research findings and limitations encountered, the chapter should explain, why certain issues mentioned in the toolkit were not applicable or why complementary issues were considered critical and necessary. This information will allow for a better comparison of baseline studies carried out in different countries or regions, and will contribute to a progressive improvement of the toolkit itself. The conclusions shall clearly identify the essential deficiencies and weaknesses of the ASM sub-sector to establish the points of departure for policies and programs required to transform the activity in accordance with the Yaoundé vision.
8. Recommendations. *Tasks:* The recommendations shall be directly related to the purpose of the baseline study. It is expected that the recommendations are as specific as possible and go far beyond general statements (like: “mercury contamination should be reduced”), and allow for strategic decisions about policy and program design, and improving performance in poverty reduction and development of sustainable livelihoods.

ANNEX V of the toolkit provides a compilation of detailed tasks, checklist issues and benchmark indicators. In concordance with the instructions for chapter 6 of the baseline study, this task-list has to a certain extent referential character. Complementary tools and inputs for carrying out the baseline study can be found at the sources provided in the chapter “Links to other useful resources” of the toolkit, as well as in the annexes of the toolkit itself.

IV. Validation of findings, reporting and feedback

(a) The consultants shall prepare a written draft final report summarizing the findings on all research tasks and submit this report to *[.....the contracting institution]* to be further distributed to the national authorities in the study country responsible for the ASM sub-sector and related policy design. The consultants shall organize a national workshop at which the findings shall be presented to and discussed with a selected group of stakeholders, including representatives of mining authorities, district and local authorities, community leaders, artisanal miners and their family members, community members affected by the activity, as well as other stakeholders. The purpose of this workshop is to verify the findings and to close information gaps relevant for policy and program design.

(b) The workshop shall also determine the most appropriate forms of feedback (FINAL report and FINAL results/recommendations) to the stakeholders and the researched community, making sure the members of the community not only get the relevant information but also understand the reason, why this exercise was undertaken and how they may also benefit from the knowledge. Moreover, stakeholders, e.g. community-leaders, mining associations, etc. should have access to the final report (even without internet access) to use it for their own agendas (lobbying, planning of projects etc.).

(c) Incorporating the recommendations offered by the workshop participants, the consultants shall prepare the final baseline report.

(d) All involved parties agree, that although the final product is their shared intellectual property, it shall be declared Public Domain and may be reproduced, distributed and used, without restriction or need for authorization by the sponsoring institution(s) or the author(s), as long as the reproduced or distributed version contains the information about sponsoring institution(s) and author(s).

7. Conclusions and recommendations for future applications

The limited comparability and wide variability of past baseline studies made it desirable to come up with a standard format for future profiling work related to artisanal and small-scale mining in developing countries. The “toolkit” developed as the principal product of this research program is an attempt to provide such a uniform norm for the benefit of researchers in different parts of the world. Its general use will ascertain that future baseline studies will generate the diagnostic insights and produce the information necessary for the design of policies suitable to make the ASM sub-sector a more sustainable economic activity in line with the Yaoundé millennium goal.

Recommendation: Make the use of the toolkit mandatory for all future baseline surveys sponsored by bilateral and multinational agencies to guarantee minimum data requirements and comparability of baseline reports.

While the toolkit places special emphasis on the need to provide reproducible quantitative data that can be used as benchmark indicators to monitor progress, it is not intended as a universal recipe for rigid application in profiling work. Quite contrary, as artisanal mining is carried out in so many different forms and within an enormous variety of cultural settings, its application in practice has to be flexible. More specifically, the use of individual tools has to be adapted to the particular circumstances of the research site on a case by case basis. Moreover, the current version of the toolkit should not be considered a final product but rather a first prototype that needs to be tested and refined based on the concept of continuous improvement.

Recommendation: Test the toolkit in selected ASM communities and implement refinements based on lessons learned on a continuing basis. Also adapt the toolkit to new concepts and approaches in development work, changing development goals and poverty reduction strategies, as they become available.

For the short-term testing of the toolkit, the following two different strategies are considered possible:

- (a) consecutive testing, i.e. carrying out one baseline study after the other and applying the lessons learned from each target region to progressively improve the toolkit before it is tested again in the next region;
- (b) simultaneous testing, i.e. conducting baseline studies in several target areas at the same time, accompanied by extensive networking and an exchange of working experiences among the different national research teams, aimed at improving the toolkit on the job.

The two options differ both in terms of the resources required per unit time and the duration of the refinement process. Option (a) will require fewer resources but will take longer to complete the refinement cycle, while option (b) will need a larger amount of resources but may achieve improvements in a shorter period of time.

Another important conclusion from this research effort has been that apparently not all of the baseline reports carried out in African countries within the past two decades or so are readily available for review. Since profiling work is frequently carried out in the form of one-time projects, chances are that information collected in baseline reports disappears or cannot be easily located once

the project is finished and the researchers pursue new assignments. Loss of baseline information due to inefficient information management and sharing leads to a wastage of valuable resources through the necessity of repeating work that has already been done, rather than to concentrating merely on filling remaining gaps.

Recommendation: Provide a central platform for collecting, storing and sharing baseline studies related to artisanal and small-scale mining. Make past and future baseline reports publicly available in an online repository for direct access and downloading to facilitate information sharing among the stakeholders within the artisanal mining community. The knowledge center at the CASM Secretariat is considered the most appropriate site for this purpose.

ANNEX I.: Inventory of baseline studies

ANNEX I.1.: Studies on Anglophone Africa and Mozambique

Country/ Region	Title	Prepared for	Prepared by	Date
Ethiopia	Study Report on Poverty Eradication and Sustainable Livelihood: Focusing on Artisanal Mining Communities in Ethiopia	UNDP/ UNDESA	Assefa Bersoufekad & Associates	
	- Summary Report (18 p)			July 2002
	- Main Report (201 p)			July 2002
	- Case Study Report on Hayadima (44 p)			July 2002
	- Summary Report (38 p)			October 2002
	- Main Report (204 p)			October 2002
	- Case Study Report on Hayadima (47 p)			October 2002
	- Case Study Report on Senkelle (35 p)			October 2002
	- Proceedings of Workshop (36 p)			October 2002
Ghana	Regularisation of Small Scale Gold and Diamond Mining in Ghana	Minerals Commission	Mackay & Schnellmann Ltd.	April 1987
	- Report (140 p)			
	- Appendices (197 p)			
	A Contextual Review of the Ghanaian Small-scale Mining Industry (29 p)	MMSD	G. Hilson	September 2001
	Poverty Eradication & Sustainable Livelihoods: Focusing on Artisanal Mining Communities	UNDP/ UNDESA	MIME CONSULT LTD.	October 2002
	- Final Report (89 p)			
Mozambique	Artisanal Mining Baseline Survey Mozambique	World Bank/ National Directorate of Mines	TopTecMinas, Lda., E. Kazilimani, and F. Bukali	2000
	- Final Report (110 p)			
Tanzania	Small Scale Mining in Tanzania – A Technical Assessment (88 p)	UNDP	John Hollaway & Associates	April 1993
	Baseline Survey and Preparation of Development Strategy for Small Scale and Artisanal Mining Program	World Bank/ Ministry of Energy and Minerals	Tan Discovery Minerals Consulting Co.	November 1996
	- Final Report (200 p)			
	- Proceedings of the First Workshop (34 p)			
	The Impact of Technology on Poverty Alleviation: A Study of Artisanal Mining in Tanzania (116 p)	State Mining Corporation	W.K. Mutagwaba, R. Mwaipopo-Ako, A.L. Mlaki	July 1997
Zambia	Review of Zambia Gemstone Sector and Development Strategy	The World Bank	Tyler Associates	July 2002
	- Draft Report (40 p)			
SADC Malawi, Mozambique, Tanzania, South Africa, Zambia, Zimbabwe	Small-scale Mining and Sustainable Development within the SADC Region (165 p)	MMSD	SANTREN/ITDG B. Drechsler (Ed.)	August 2001

ANNEX I.2.: Studies on Francophone Africa

Country	Title	Prepared for	Prepared by	Date
Burkina Faso	Amélioration d'exploitation minière artisanale - Rapport socio-économique (29 p) - Rapport sur la santé (50 p)	Banque Mondiale	Groupement GEOMAN CONSULT LTD./TEAMS	2001
	Small-Scale Mining in Burkina Faso (35 p)	MMSD	Djibril Gueye	October 2001
Cameroun	Etude socio-économique et environnementale du PR de Kambélé. Phase préliminaire (25 p)	BEMA OR Cameroun	Onana Pascal, Ngoma Prosper	Février 1998
	Etude Socio-économique et Environnementale de Kambélé Zone de Kambélé III. Phase terrain (39 p)	BEMA OR CAMEROUN	Onana Pascal, Ngoma Prosper	Avril 1998
Congo	APERCU SUR LA GESTION DE L'ORPAILLAGE AU CONGO (19 p)	Ministere des Mines, de L'Energie et de L'Hydraulique	Direction Generale des Mines et de la Geologie	Novembre 2002
Guinée	Eradication de la pauvreté et de développement des moyens d'existence durable dans les communautés minières artisanales - Plan triennal et plan annuel assortis des microprojets (52 p) - Rapport d'étude de formulation (103 p) - Monographie des villages de Djirland et de Banankoro (189 p) - Atelier national - Rapport synthese (15 p)	PNUD	EUPD/CBG	Jun 2002 Julliet 2002 Octobre 2002
Madagascar	Rapport d'enquête de terrain sur les mines à petite échelle à Madagascar (11 p)	Direction des Mines	ITC et Projekt- Consult, John Simpson	Mai 2000
	La petite exploitation minière à Madagascar. Etude socio-économique (36 p)		ITC et Projekt- Consult, J.L. Camillieri	Mai 2000
	Etude diagnostique sur l'exploitation minière à petite échelle à Madagascar (62 p)		ITC et Projekt- Consult, M. Priester	Septembre 2000
	Conditions légales e économiques pour la petite exploitation minière et les industries en aval à Madagascar (54 p)		ITC et Projekt- Consult, W. Wetzenstein	Août 2001
Mali	Study on Artisanal and Small-Scale Mining in Mali (32 p)	MMSD	Seydou Keita	August 2001
	Eradication de la pauvreté et de développement des moyens d'existence durable dans les communautés minières artisanales du Mali – - Rapport de l'atelier de validation (11 p) - Rapport Final (56 p)	PNUD	CAFPD	Oct. 2002 Nov. 2002
Niger	Child labour in small-scale mines in Niger In: Jennings, N.S. (Ed.). Child labour in small- scale mining: Examples from Niger, Peru & Philippines.	International Labour Office (ILO)	Alfa, Soumaïla.	Geneva, 1999

ANNEX II.: Preliminary Review of Country Studies

ANNEX II.1.1: Burkina Faso 2001a

<p>Key aspects of baseline survey</p>	<p>Groupement GEOMAN CONSULT LTD./TEAMS Amélioration d'exploitation minière artisanale. Banque Mondiale, 2001. Rapport socio-économique & rapport sur la santé</p>
<p><u>1. Objectives of study</u></p> <ul style="list-style-type: none"> - List and describe all occupational groups, their tasks and work method, main economic and labour constraints including health risks, and economic gains - Document health, sanitation, and occupational hazards of artisanal miners and people working in the mining service economy - Determine knowledge, attitudes, and practices of artisanal miners vis-à-vis HIV/AIDS - Evaluate sanitary conditions at artisanal mining sites 	
<p><u>2. Methodologies and survey techniques employed for data collection and analysis</u></p> <ul style="list-style-type: none"> - Field research was conducted between Feb 5-June 9, 2001, at five different mining sites in Burkina Faso - Survey (questionnaire) of artisanal miners and people working in the mining service economy. - Observation of hygiene and sanitary conditions using a pre-designed check-list. - Sampling of survey respondents occurred proportional to the population in each mine site and to each occupational groups (N=458). - Analysis made use of program EPI-INFO. The results are presented per site. 	
<p><u>3. Key parameters or characteristics documented and evaluated</u></p> <p>3.1. Legal</p> <ul style="list-style-type: none"> - Mining licenses are mentioned but not discussed - Public legal enforcement (i.e. police) is absent from most sites. <p>3.2. Technical</p> <ul style="list-style-type: none"> - Miners use mostly simple tools, including hammers and mortars to crush stones, shuffles, etc. <p>3.3. Economic</p> <ul style="list-style-type: none"> - Earnings vary widely according to profession at the mining site as well as between mining sites. On the site of <i>Bouda</i>, for example, five surveyed permit holders earned between 30,000-5,000,000 CFA/month; miners in the shaft (N=16) earned on average ~ 58,000 CFA/month; female crushers earned on average ~ 32,500 CFA/month; Younger women who sift through the tailings earned ~ 10,000 CFA/month; Young male and female ore washers earned ~ 42,500 CFA; mine bosses (trustees of the permit holder) earned between 10,000-40,000 CFA/month; Gold buyers earned ~ 100,000 CFA/month; Merchants earned between 30,000-100,000 CFA/month; female restaurant owners earned ~ 22,000/month; Water vendors earned ~ 10,000/month. - The study lists assets for several occupational groups, including bicycle, real estate, and live stock - Miners displayed no awareness of economic costs of illness and accidents versus economic cost of taking safety measures (i.e. buying a mask, gloves, or boots). <p>3.4. Gender and children participation</p> <p>Some jobs are only performed by men (i.e. work in the shaft), some exclusively by women (crushing), and some by both sexes (i.e. washing gold). Men generally earn more than women.</p> <p>3.5. Environmental</p> <ul style="list-style-type: none"> - See under health (3.6) <p>3.6. Health and safety</p> <p>The principle sanitary, health, and safety problems are comparable between sites. These problems are :</p> <ul style="list-style-type: none"> - Consumption of psycho-actives i.e. amphetamine - Use of toxics incl. Mercury and nitro-acids without any preventive measures - Continued inhalation of dust causes a high rate of respiratory diseases - Insufficient access to health care services - Lack of knowledge of general STDs - Discrepancy between knowledge of symptoms and transmission of HIV/AIDS, and sexual practices - Miners ignored many health conditions including over-exhaustion and related accidents, exposure to sun, and disease transmission due to working in a badly ventilated area. - Most common diseases on all sites are respiratory diseases (silicosis lungs, coughing), exhaustion, chest pains, malaria, meningitis, STDs incl. HIV/AIDS. 	

<ul style="list-style-type: none"> - Frequent accidents and injuries to arms, legs, and other body parts - Few miners use protective gear such as masks <p>3.7. Community</p> <ul style="list-style-type: none"> - Poor public health and hygienic conditions ; absence of clean drinking water, toilets, and sewage system - High percentages (>80%) of people say they are content with the quality of drinking water <p>3.8. Vulnerability</p> <ul style="list-style-type: none"> - ASM has regained popularity in response to draughts and famine
<p><u>4. Parameters identified as indicators against which change could be measured</u></p> <ul style="list-style-type: none"> - Income - Lost working days due to disease and injuries - Number of fatal and serious accidents in small mines
<p><u>5. Limitations identified by original researchers related to data collection and analysis, and scope and extent of coverage</u></p> <ul style="list-style-type: none"> - data collection: N/A - <i>scope and extent of coverage</i>: survey did not explore popular perceptions of public hygiene, use of latrines, and other issues relevant to the development and implementation of a campaign/policy that promotes sanitary health. - <i>scope and extent of coverage</i>: Campaigns to promote better health, sanitation, and safety on and around mines should not only target miners and those working in mining areas, but also include people from surrounding villages who likely are affected. - <i>Data analysis</i>: N/A - <i>Others</i>: Mining populations are often transient and fluctuating: data collection from one moment in time may no longer present an accurate picture soon afterwards.
<p><u>6. Recommendations made by original researchers for further evaluation, data collection and/or data analysis (some implicit)</u></p> <ul style="list-style-type: none"> - Data collection on awareness of sanitation and hygiene with the purpose to sensitize artisanal miners to higher standards of health, sanitation, hygiene, and safety. - Research how to encourage people to adopt safe-work and safe-sex practices. - Data collection among people in villages surrounding artisanal mines.
<p><u>7. New, unique or significant attributes of artisanal mining activity identified</u></p> <ul style="list-style-type: none"> - Partially quantitative analysis of miners' awareness of economic costs of mining related illness and injuries - Partially quantitative analysis of miners' awareness of dangers of working with or in the proximity of dust and chemicals, and of risk of overexposure to sun and standing long in water. - Evaluation of HIV/AIDS awareness and sexual practices in ASM communities - Very detailed description and quantitative estimation of earnings, assets, illness, and sanitary conditions

ANNEX II.1.2: Burkina Faso 2001b

Key aspects of baseline survey	Gueye, Dibril. Small-scale mining in Burkina Faso. MMSD report # 73, IID and World Business Council for Sustainable Development. October 2001
<u>1. Objective of study.</u> - Not stated. The study provides a general description of ASM in Burkina Faso	
<u>2. Methodologies and survey techniques employed for data collection and analysis</u> - Not explicitly mentioned. - Study is primarily descriptive and appears to be based on analysis of existing data.	
<u>3. Key parameters or characteristics documented and evaluated</u> <u>3.1. Legal</u> - The governmental Directorate of Small Scale mining, among others, trains gold traders, organizes workshops to manufacture appropriate equipment, and generally regulates the ASM sector - Small scale miners need administrative authorisation but are exempt from legal requirements to obtain mining title <u>3.2. Technical</u> - Minerals are exploited from alluvium and aluvion deposits by scraping and digging at the surface and in depth - Exploitation of reefs can often be carried out to 50 m with rudimentary tools <u>3.3. Economic</u> - BF has a long history of mining but its significance increased during the draughts of the 1980s. An estimated 100,000-200,000 ASM, often previous farmers, work on a maximum of 2000 sites across the country. - National artisanal gold production 1986-2000 is 14,474 kg total - Average per person production is about 35 g of gold per year; <u>3.4. Gender and children participation</u> - Among those working in mining areas 50% men, 45% women, and 5% children <u>3.5. Environmental</u> - Mining further damages arable land already threatened by severe droughts, poverty, and agricultural practices - Increased use of mills damages the environment by spillage of gas and oil, and noise pollution <u>3.6. Health and safety</u> - Use of 'hazardous' and 'maladapted' mining methods - Miners live in poor housing without adequate access to drinking water, electricity, and sanitation - Widespread substance abuse (alcohol and hard drugs), theft, and other criminal activities - Main diseases: meningitis, cholera, malaria, skin diseases, diarrhoea, respiratory infections, and HIV/AIDS <u>3.7. Community</u> - During the dry season, many community members work on ASM sites - ASM is primarily practiced by local migrant miners <u>3.8. Vulnerability</u> - Small scale gold mining helps overcome difficult times, e.g. after a poor harvest - 80% of the population lives of heavily weather dependent agriculture	
<u>4. Parameters identified as indicators against which change could be measured</u> - Not explicitly mentioned and little quantitative data is provided - One could use as indicators: annual production of gold by ASM - % of children in mining.	
<u>5. Limitations identified by original researchers related to data collection and analysis, and scope and extent of coverage</u> - Difficulty to obtain data from mining where the activity is temporary and seasonal, and production is sold outside legal channels	
<u>6. Recommendations made by original researchers for further evaluation, data collection and/or data analysis</u> - Not explicitly mentioned. However, research is likely needed to execute report recommendations that include: improvement of working conditions of miners, and of women and children on mine sites; improve access to financial assistance for ASM; and stricter environmental regulation	
<u>7. New, unique or significant attributes of artisanal mining activity identified</u> - Recommends that improvement of working and living conditions for ASM may best be achieved within broader context of poverty alleviation in BF	

ANNEX II. 2.: Cameroun 1998

Key aspects of baseline survey	Onana Pascal and Ngoma Prosper. Etude Socio-économique et Environnementale de Kambélé, Zone de Kambélé III. BEMA OR Cameroun. February and April 1998
<p><u>1. Objective of study</u></p> <ul style="list-style-type: none"> - Provide and correct current data on the socioeconomic and environmental conditions of the village of Kambélé III, in particular related to artisanal gold mining activities. - Evaluate the economic importance of agriculture versus mining. 	
<p><u>2. Methodologies and survey techniques employed for data collection and analysis</u></p> <ul style="list-style-type: none"> - Field research was conducted for 10 days. - Geographic positioning with the help of a GPS Magellan 2000 unit. - The researchers use formal surveys, informal discussions, and visits to different sites where digging, crushing, and washing of gold take place. Houses and other buildings were numbered and classified according to construction materials. - Demographic data were obtained from a survey with 55 households. - The preliminary report (February) uses secondary data from different sources 	
<p><u>3. Key parameters or characteristics documented and evaluated</u></p> <p>3.1. Legal</p> <ul style="list-style-type: none"> - Access to land is free for all community members, though through approval of local chiefs, - Virtually no-one has official (legal) titles to the land <p>3.2. Technical</p> <ul style="list-style-type: none"> - Quarry and alluvial mining - Most mining occurs with simple tools (hammer, shuffle, pans) and small pumps. <p>3.3. Economic</p> <ul style="list-style-type: none"> - ASM (labourer in a team) works typically about 200 days/yr to earn ~ 825,000 CFA/yr, ranging between 300,000 CFA/yr in a bad season and 1,300,000 CFA/yr in a good season - Women earn, on average, about 520,000 CFA/yr if they are working exclusively in ASM. Distilling alcohol women can make an additional ~ 288,000 CFA a year, and vending food ~ 360,000 CFA/yr. - The mine owner earns on average ~ 1,650,000 CFA/yr - Earnings of mining are higher than earnings in alternative jobs, notably agriculture - Few ASM save money or invest in durables, though a few individuals have constructed better homes in urban areas or bought motorized vehicles - Migrants from North Cameroon and Mali who dominate gold buying and marketing earn more from mining than local people (called Kako) working at ASM sites <p>3.4. Environmental</p> <ul style="list-style-type: none"> - Lands affected by small-scale gold mining are lost for other land uses <p>3.5. Gender and children participation</p> <ul style="list-style-type: none"> - Women do not work in the quarry but exploit surface materials. - Women tend to earn more regular and stable yet lower incomes than men, and rely on men for the additional income. - If a woman's incomes are high, it is expected that she gives a share to her husband - The myth prevails that a woman in the quarry will bring bad luck - (Young) men tend to spend their money rapidly on alcohol, women, and clothing; women's incomes are used to feed the family and other domestic uses. - Only 30% of school-aged children follows regular education; close to 60% of school aged children no longer attend school - Children manage money from a young age and do not see the use of education as alternative (educated) jobs are scarce and ASM earn more than village officials - ASM offers some children an opportunity to plan for a better future as they search for gold on weekends and holidays to pay for school. <p>3.6. Health and safety</p> <ul style="list-style-type: none"> - Most common diseases are: malaria, typhoid, HIV/AIDS, respiratory diseases (silicosis lungs), gastro-enteritis (through consumption of contaminated food and water), nutrition-related illnesses. 	

<ul style="list-style-type: none"> - Only 2% of households eat three meals a day; daily meat consumption per individual is between 25-100g - Sanitary conditions are poor. In the central village 80% of households has a latrine, but these are virtually inexistent in peripheral neighbourhoods. The quality of water used for drinking and cooking is bad, - Miners use no protective gear - Livestock is held in unhygienic conditions - Miners do have access to clinics and health services - Not all health problems are related to mining but virtually all are due to poverty. <p>3.7. Community</p> <ul style="list-style-type: none"> - Houses are between 4 and 60 m², for the largest share made out of a mixture of dung, earth, and straw - The main communities have road access, electricity, and a telephone connection - About 30% of the population are migrants attracted by ASM <p>3.8. Vulnerability</p> <ul style="list-style-type: none"> - Number of miners grows in the dry season and falls in the rainy season in response to fluctuations in agricultural income - Researchers discuss investment of earnings and future perspectives.
<p><u>4. Parameters identified as indicators against which change could be measured</u></p> <ul style="list-style-type: none"> - Revenues / incomes of different population groups - Assets owned by individuals in different professional groups - All other quantitative data mentioned in 3.
<p><u>5. Limitations identified by original researchers related to data collection and analysis, and scope and extent of coverage</u></p> <ul style="list-style-type: none"> - For preliminary work: the location of existing information is poorly known and their content not readily revealed to the researchers, who were met with suspicion. - When found, even official documents frequently required payment. The fee was raised when researchers revealed their affiliation with BEMA OR - The (semi) clandestine nature of much mining activity made that artisanal miners were initially suspicious towards the researchers. This limited data collection as researchers, for example, stayed at a distance when transactions between miners and merchants took place.
<p><u>6. Recommendations made by original researchers for further evaluation, data collection and/or data analysis</u></p> <p>Future field visits are recommended to:</p> <ul style="list-style-type: none"> - Study communities surrounding the mining sites, including a more complete population census - Analyse investment patterns of miners; why do mining incomes not lead to higher standard of living? - Observe mining activity during the peak season - Inform local miners about the activities of BEMA OR, and organize meetings with local authorities - Understand cultural and religious traditions that are relevant to large-scale mining activity in the area
<p><u>7. New, unique or significant attributes of artisanal mining activity identified</u></p> <ul style="list-style-type: none"> - Frank discussion of problems encountered in collecting <i>accurate and meaningful</i> (quantitative) data for an industry that is largely informal, clandestine, and embedded in political intrigue. - Detailed qualitative and quantitative data, including efforts to estimate earnings and wealth associated with different ASM related professions. - Discussion of the different roles and power positions of different ethnic groups in mining.

ANNEX II.3.: Congo 2002

Key aspects of baseline survey	Aperçu sur la gestion de l'orpaillage au Congo Ministère des mines, de l'énergie et de l'hydraulique, November 2002
<u>1. Objective of study</u> - Reflection on the best practices and policies to develop artisanal (gold) mining as a viable economic activity that has the potential to contribute favourably to the well-being of rural populations.	
<u>2. Methodologies and survey techniques employed for data collection and analysis</u> - Not explicitly mentioned. - Study is primarily descriptive, based on observations and analysis of existing data.	
<u>3. Key parameters or characteristics documented and evaluated</u> 3.1. Legal - Miners do not pay a financial contribution to the national treasury (government taxes?). - Number of new mining laws in the 1960s stimulates ASM - Sale of all gold production is regulated through an accord between artisanal miners and MAC-CONGO; before the arrival of MAC-CONGO it was sold to merchants where miners bought their necessities - Much of mining activities and selling of gold continues to take place informally. 3.2. Technical - Miners excavate pits of approximately 5 by 6 meters surface area and 6-7 meters in depth - Working tools are generally simple; pick-axes, plastic bags to move water, a small sluice box (1.5 m) - MAC-CONGO supports the purchase of working materials (pumps) and provides technical assistance to improve production. 3.3. Economic - National ASM production in the late 1990s (1996-1999) has ranged between 12 and 54 tonnes of gold/yr - Local production has increased to an average of 300g/month, with peaks to 500 g and 600 g/month (not clear whether this value concerns all miners in the area or per team production) - Fluctuations in the price of gold depend more on local working conditions than on the world market 3.4. Environmental - Environmental degradation is mentioned in passing but not evaluated 3.5. Health and safety - Health and safety are not evaluated 3.6. Community - More than 200 of the 400 community members work in ASM. - Miners are organised in a cooperative, under the auspices of MAC-CONGO 3.7. Vulnerability - The researchers suggest that ASM can reduce their vulnerability and improve economic security through a partnership with a larger formal mining company such as MAC-CONGO.	
<u>4. Parameters identified as indicators against which change could be measured</u> - Virtually none	
<u>5. Limitations identified by original researchers related to data collection and analysis, and scope and extent of coverage</u> - Not specified.	
<u>6. Recommendations made by original researchers for further evaluation, data collection and/or data analysis</u> - Nothing explicitly mentioned. - The conclusions suggests that it would be beneficial to continue evaluation of the partnership between artisanal miners and MAC-CONGO. In particular: what are the benefits (and costs) to both parties of this partnership.	
<u>7. New, unique or significant attributes of artisanal mining activity identified</u> - Partnership between artisanal miners and a larger, formal mining society that should bring advantages to both parties: artisanal miners receive material and technical support and the (governmental?) Mining association benefits from regulation and formalization of mining activities and gold trade.	

ANNEX II.4.: Ethiopia 2002

<p>Key aspects of baseline survey</p>	<p>Assefa Bersoufekad & Associates: Study Report on Poverty Eradication and Sustainable Livelihood: Focusing on Artisanal Mining Communities in Ethiopia. UNDP/UNDESA, October 2002.</p>
<p><u>1. Objectives of study</u></p> <ul style="list-style-type: none"> - The main objective of the study is to develop policy options and practices towards sustainable livelihoods of artisanal mining communities of Ethiopia. 	
<p><u>2. Methodologies and survey techniques employed for data collection and analysis</u></p> <ul style="list-style-type: none"> - The main methods used for undertaking the study include a review of related literature and field investigations. - Literature Review: The desk work involved the review of secondary data which comprised of publications, bulletins, project documents, published and unpublished reports, previous survey findings, etc. - Field investigations: The field investigation task involved among others: Holding internal community meetings, listing of projects and organizations operating in the community by brainstorming with a representative group, interview sessions with relevant officials and staff of concerned institutions at different levels (micro, meso and macro levels) including women and youth organisations, community appraisal through discussion with representatives of communities and relevant organizations / institutions, gathering information through checklist and questionnaires, and focus-group discussion with relevant persons selected from concerned organizations and institutions to gather inputs and get feedback. - The field investigations and data collections are concentrated on two Case Study Areas 	
<p><u>3. Key parameters or characteristics documented and evaluated</u></p> <p>3.1. Legal</p> <ol style="list-style-type: none"> a) Quarry-case study: almost all mining activities are licensed, license holders are “better off” while the workers are “poor” b) Gold-case study: Procedures and regulations for licensing of artisanal gold mining activities have been simplified. However, almost all of the gold mining activities as well as the marketing are still informal. <p>3.2. Technical</p> <ul style="list-style-type: none"> - Miners use mostly simple tools and very basic processing methods. <p>3.3. Economic</p> <ul style="list-style-type: none"> - Estimated average annual incomes of artisanal gold miners range from Birr 600 to Birr 3750 (US\$ 70 to US\$ 435). - Quarry workers in Senkelle earn between an estimated amount of Birr 1000 to 3000 (US\$ 117 to US\$ 350) per annum. - Miners’ income, if converted to per capita income, is lower than the national average. The activity in general is characterized as unproductive, uncontrolled, uneconomical, and unhealthy lacking operational safety. <p>3.4. Gender and children participation</p> <ul style="list-style-type: none"> - Not highlighted in the study. In the “quarrying area”, 55% of the population are female - Children are helping their parents as part of their up-coming. This is “normal” and not restricted to mining activities. <p>3.5. Environmental</p> <ul style="list-style-type: none"> - Like many other activities, mineral resource development operations have negative impacts on the physical, biological and social environment. The artisanal mining operations are becoming a case for land degradation, deforestation, loss of wildlife resources, source of pollution to surface and underground water bodies. 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 residents and natural resources. The lack of clear policies and regulations, absence of appropriate institutional arrangements to deal with the environment are contributing to the unsustainable development of the resources. - The artisanal mining operators work outside the formal sector 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. <p>3.6. Health and safety</p> <ul style="list-style-type: none"> - Artisanal mining activity is probably the most hazardous of any occupation. At both study areas health measures and occupational safety are neglected. The number of health institutions in the artisanal mining areas is too small when compared to the size of the population. Even the existing institutions lack capacity in terms of skilled manpower, equipment and medicine. No safety/security procedure is considered in the mining activity. The 	

<p>situation obviously requires greater attention of the government and other stakeholders to safeguard the human resource from diseases and industrial accidents.</p> <p>3.7. Community</p> <ul style="list-style-type: none"> - The artisanal miners at Hayadima are migrants from various parts of the country with differing cultural backgrounds. This creates fusion of cultures. They work in groups of 4-6 persons to dig for gold prospecting. They live together and eat in the local restaurants in the camps. For a large number of artisanal miners assistance from fellow workers in times of hardship represents efforts in gathering forces and pooling resources to face the challenges of poverty. Co-operatives are non-existent at both Hayadima and Senkelle artisanal mining areas. Assistance is received only from the extended family or close friends. In the case of Hayadima, however, since the miners are migrants this help was found to be rather small.
<p><u>4. Parameters identified as indicators against which change could be measured</u></p> <ul style="list-style-type: none"> - The study works with “poverty” as the main indicator, whereby an obviously already traditionally established “social grading system” within the community has been used. This system distinguishes between “very poor”, “poor”, “better of” and “rich” The study tries now to find out how many % or who within the target group is now found in group a,b,c,or d and why.
<p><u>5. Limitations identified by original researchers related to data collection and analysis, and scope and extent of coverage</u></p> <ul style="list-style-type: none"> - Due to lack of resources, only two out of estimated more than hundred ASM-areas could be included in the study as case studies. Therefore it is questionable to what extent the collected data can be seen as representative for the whole country.
<p><u>6. Recommendations made by original researchers for further evaluation, data collection and/or data analysis</u></p> <ul style="list-style-type: none"> - According to the limitations mentioned in item 5, the study recommends further data collection from more ASM-areas around the country to get representative results.
<p><u>7. New, unique or significant attributes of artisanal mining activity identified</u></p> <ul style="list-style-type: none"> - Unlike in most of the other studies on ASM, miners are described as very poor in their community and compared with other ways of income (down to US\$ 0.60/day compared to 10-20 times more in other studies describing other African countries). The study concludes: “ The artisanal mining activities in the country in general and in the two study areas in particular, have not yet reached a stage whereby they can provide sustainable livelihoods.....” - Consequently, the study allows the question if or if not, artisanal mining should be supported. (It also provides the answer which is a “yes, but...”)

ANNEX II.5.1.: Ghana 1987

Key aspects of baseline survey	Mackay & Schnellmann Ltd. Regularisation of Small Scale Gold and Diamond Mining in Ghana. Minerals Commission, April 1987.
<p><u>1. Objective of study</u></p> <ul style="list-style-type: none"> - To recommend institutional and operational measures to improve the contribution of small-scale diamond and gold mining to Ghana's economy; 	
<p><u>2. Methodologies and survey techniques employed for data collection and analysis</u></p> <ul style="list-style-type: none"> - field visits to 8 gold and 3 diamond small-scale mining areas between November 1986 and February 1987; - discussions with many small-scale operators; - literature review on small-scale mining worldwide, including related licensing requirements and institutional framework; 	
<p><u>3. Key parameters or characteristics documented and evaluated</u></p> <p>3.1. Legal</p> <ul style="list-style-type: none"> - With the possible exception of the mechanism of granting Diamond Digging Licences, the present legal, financial and technical restrictions preclude the "very small-scale miner" from obtaining a concession; - Recent rapid growth in unauthorised working for gold and diamonds is mainly due to the imposition of foreign currency restrictions and the maintenance of artificial official exchange rates; <p>3.2. Technical</p> <ul style="list-style-type: none"> - The organisational structure of the galamsey was of a high order, effective and appropriate to their scale of operation; - Mining is entirely manual; extraction and crushing of ore is done with hammers; grinding is carried out in mortars; fine ore is processed in sluices; - Stream-bed gravels are worked by panning or sluicing and pan concentrates are commonly mercury amalgamated; - In gold mining actual recovery through all stages of extraction and processing is in the order of only 30 %; - In diamond mining alluvial material is extracted usually by wasteful pitting methods using shovels and hoes; - In alluvial diamond mining, overall recovery is estimated to be of the order of 25-30 % of the in-situ diamond content; <p>3.3. Economic</p> <ul style="list-style-type: none"> - Most of the galamsey gangs interviewed which generally numbered between 4 and 6, appeared to produce gold worth US\$ 12.5-25 per day, resulting in average earnings of about US\$ 2-6/worker/day; - At the time of the study all of the gold produced by the small-scale or galamsey operator estimated at US\$ 15-20 million, is marketed illegally; - Due to the disparity of the official and unofficial purchase prices licensed diamond diggers market the vast majority of the output through illegal channels (the black market rate at the time of the study was some 20-30 % above the auction exchange rate); - Based on estimates provided by the Diamond Marketing Corporation, diamonds worth > US\$ 14 million were smuggled out of Ghana in 1985; <p>3.4. Gender and children participation</p> <ul style="list-style-type: none"> - The study does not investigate gender aspects, but mentions that women are engaged in washing gravel in small-scale diamond mining in the Bonsa River area; in Akim Oda women workers seated below sun shades were observed screening concentrate in clean water and handpicking diamonds; <p>3.5. Environmental</p> <ul style="list-style-type: none"> - The study does not specifically investigate environmental effects, but mentions that gold mining operations visited in the Juaboso and Asiakwa area were not causing any environmental damage; the study also observes that workings where stream-channel gravels are washed for gold, do not cause environmental damage; <p>3.6. Health and safety</p> <ul style="list-style-type: none"> - Although no figures are presented in the study, it is thought that many cases of long term illness and premature death occurred due to use of mercury; <p>3.7. Institutional</p> <ul style="list-style-type: none"> - At the time of the study, the Inspectorate of Mines is essentially inoperative, due to inadequate staff levels and lack of transport; 	
<p><u>4. Parameters identified as indicators against which change could be measured</u></p> <ul style="list-style-type: none"> - The report does not specifically mention any indicators; however, annual value of production, average earnings of mine workers, and overall recovery of gold and diamonds, for which data are presented, could be used; 	

<p>5. <u>Limitations identified by original researchers related to data collection and analysis, and scope and extent of coverage</u></p> <ul style="list-style-type: none"> - No specific limitations identified by original researchers;
<p>6. <u>Recommendations made by original researchers for further evaluation, data collection and/or data analysis</u></p> <ul style="list-style-type: none"> - No specific recommendations are made by original researchers regarding further evaluation or data collection;
<p>7. <u>New, unique or significant attributes of artisanal mining activity identified</u></p> <ul style="list-style-type: none"> - the licensing system in place at the time of the study, presents an almost insuperable barrier to the would-be small miner even if he was financially and technically qualified for grant of a concession; - all of the gold produced by small scale operators or galamsey (US\$ 20 million/year) and the majority of the small scale diamond production (>US\$ 14 million/year) is marketed illegally; - the study presents a comprehensive system of measures required for the regulation of small scale mining, including the formation of the regulatory authority, legislative measures, allocation of work areas, methods of registering and applying for a mining licence, methods of purchasing and marketing, monitoring, training and assistance.

ANNEX II.5.2.: Ghana 2001

Key aspects of baseline survey	G. Hilson. A Contextual Review of the Ghanaian Small-scale Mining Industry. MMSD, September 2001.
<p><u>1. Objective of study</u></p> <ul style="list-style-type: none"> - to provide a detailed overview of the Ghanaian small-scale mining industry with special emphasis given to gold and diamonds. 	
<p><u>2. Methodologies and survey techniques employed for data collection and analysis</u></p> <ul style="list-style-type: none"> - Study does not mention methodologies employed; - the section on “background reading” indicates that it is primarily based on a review of existing literature supplemented by an unspecified number of interviews and mine visits. 	
<p><u>3. Key parameters or characteristics documented and evaluated</u></p> <p>3.1. Legal</p> <ul style="list-style-type: none"> - Of the 200,000 persons directly involved in the extraction of gold and diamonds only about 30,000 are employed in the legal segment of the industry; - Invasions of large mine concessions by illegal small-scale miners (galamsey) and related land-use disputes; <p>3.2. Technical</p> <ul style="list-style-type: none"> - The most common equipment used are basic hand tools such as picks, axes, sluice boxes and shovels, although occasionally water pumps, explosives and washing plants are seen; - Most underground operations are constructed haphazardly and excavated to unsafe depths; <p>3.3. Economic</p> <ul style="list-style-type: none"> - About 60 % of the mining labour force are in small-scale mining; - The average small mine worker earns approximately US\$ 7/day, equivalent to US\$ 1,820/year; - In the period 1994-1997 small-scale gold production ranged from US\$ 30-50 million/year and small-scale diamond production was around US\$ 10 million/year; <p>3.4. Gender and children participation</p> <ul style="list-style-type: none"> - Women constitute 15 % of the legalized segment of the small-scale labour force, 10 % of concession holders and 50 % of the illegal (galamsey) workforce; - There is some degree of children participation but accurate numbers do not exist; <p>3.5. Environmental</p> <ul style="list-style-type: none"> - About 15,000 ha of land are potentially affected by small-scale mining activities; - Evidence of careless handling of mercury and mercury pollution, although with unknown dimensions; - Huge patches of forest have been removed to establish quarters or ‘resting grounds’ for miners; - Surprisingly little has been done administratively to rectify environmental problems. <p>3.6. Health and safety</p> <ul style="list-style-type: none"> - Many gold washers have elevated concentrations of mercury in their blood; <p>3.7. Institutional</p> <ul style="list-style-type: none"> - Seven small-scale district mining centers have been established, each staffed with a mine engineer and a mines inspector who register claims and provide technical advice on safe and productive operation. 	
<p><u>4. Parameters identified as indicators against which change could be measured</u></p> <ul style="list-style-type: none"> - The study does not present specific indicators - The parameters listed under item 3 can be used as indicators 	
<p><u>5. Limitations identified by original researchers related to data collection and analysis, and scope and extent of coverage</u></p> <ul style="list-style-type: none"> - The study does not mention specific limitations, but refers to a lack of information on the extent of children participation and on mercury pollution. 	
<p><u>6. Recommendations made by original researchers for further evaluation, data collection and/or data analysis</u></p> <ul style="list-style-type: none"> - The study does not make specific recommendations for further evaluation. 	
<p><u>7. New, unique or significant attributes of artisanal mining activity identified</u></p> <ul style="list-style-type: none"> - significant numbers of rural inhabitants are attracted to small-scale mining because the industry pays substantially higher wages than most other sectors; - in an attempt to prevent land-use disputes, large mining companies have allowed registered small-scale miners to work on certain areas of their concession. 	

ANNEX II.5.3. : Ghana 2002

Key aspects of baseline survey	MIME CONSULT LTD. Poverty Eradication & Sustainable Livelihoods: Focusing on Artisanal Mining Communities. UNDP/DESA. RAF99/023. October 2002.
<u>1. Objective of study</u> <ul style="list-style-type: none"> - To identify and highlight some of the key assets and areas of vulnerability to members of artisanal mining communities. - Based on this knowledge policy formulation for scaling-up ASM and creating alternative livelihoods. 	
<u>2. Methodologies and survey techniques employed for data collection and analysis</u> <ul style="list-style-type: none"> - Combined desk study and field survey based on Ghana Methodology Guidelines for Country Livelihood Surveys provided by UNDESA. - Discussions and interviews with representative groups of ASM communities and local institutions/leaders. - Field survey covered 3 communities (2 gold and 1 diamond mining), selected based on intensity of artisanal mining, overall importance in the local economy and familiarity of research team with the target areas. - Livelihood analysis of social groups (farmers, traders, miners), based primarily on qualitative information. 	
<u>3. Key parameters or characteristics documented and evaluated</u> <u>3.1. Legal</u> <ul style="list-style-type: none"> - Continued illegal mining (galamsey); - Current mining laws disproportionately favour large mining companies; - Shortage of land for ASM due to large areas given to large-scale mining companies. <u>3.2. Technical</u> <ul style="list-style-type: none"> - Lack or low level of mechanization; - inefficient exploitation and processing practices leading to low mineral recoveries. <u>3.3. Economic</u> <ul style="list-style-type: none"> - Seasonal activity due to lack of equipment (pumps) - Limited assets - Lack of investment and working capital; <u>3.4. Gender</u> <ul style="list-style-type: none"> - About 10 % of the labour force are women, working as sorters in diamond mining and as food vendors <u>3.5. Environmental</u> <ul style="list-style-type: none"> - Little attention to environmental issues; - destruction of land and water bodies. <u>3.6. Health and safety</u> <ul style="list-style-type: none"> - Little regard to occupational health and safety. <u>3.7. Community</u> <ul style="list-style-type: none"> - ASM is considered a significant and viable economic activity and source of employment and income; - cash inflow from ASM leads to high cost of living in communities. <u>3.8. Vulnerability</u> <ul style="list-style-type: none"> - Very vulnerable in relation to health and safety - Business risk due to lack of knowledge of mineral deposits (reserves, grade) 	
<u>4. Parameters identified as indicators against which change could be measured</u> <ul style="list-style-type: none"> - The study does not present specific indicators - The sustainable livelihood approach, however, implies the use of ASM income and assets. 	
<u>5. Limitations identified by original researchers related to data collection and analysis, and scope and extent of coverage</u> <ul style="list-style-type: none"> - The study does not mention specific limitations, but raises the question how ASM can be included in national data gathering. 	
<u>6. Recommendations made by original researchers for further evaluation, data collection and/or data analysis</u> <ul style="list-style-type: none"> - baseline information for providing an understanding of the state of poverty in the mining communities - assessing the level and type of economic activity in selected mining communities - assessing the extent of conflict in land use between mining companies and communities - assessing the current roles of various community level institutions 	
<u>7. New, unique or significant attributes of artisanal mining activity identified</u> <ul style="list-style-type: none"> - ASM as a cause of high cost of living in communities due to cash-inflow; - ASM as a significant and viable economic activity. 	

ANNEX II.6.: Guinee 2002

Key aspects of baseline survey	<p>Projet d'éradication de la pauvreté et de développement des moyens d'existence durable dans les communautés minières artisanales (RAF/99/023).</p> <p>Petite Monographie des villages de : Djirland, Kiniero (CRD Kiniero) – Préfecture de Kouroussa – et de Banankoro, Worokoro (CRD Banankoro) – Préfecture de Kerouane</p>
<p><u>1. Objective of study</u></p> <ul style="list-style-type: none"> - Identification of new directions for policy that contributes to poverty eradication/reduction in artisanal mining communities. <p>Specific objectives:</p> <ul style="list-style-type: none"> - Better identify different population groups directly and indirectly involved in artisanal mining (men, women, youth). - Better understand the diverse dimensions of poverty of these stakeholder groups - Better implementation of poverty reduction strategies by government as well as NGOs and the private sector who are partners in development. 	
<p><u>2. Methodologies and survey techniques employed for data collection and analysis</u></p> <ul style="list-style-type: none"> - Field research was conducted by two teams of surveyors who worked for 10 days (April 29-May 8, 2002) in two different mining regions. - The four research villages in the provinces of Kouroussa (villages of Djirland and Kinero centre) and Kérouané (Villages of Banankoro centre and Worokoro campement) were selected to capture variety in diamond or gold mining, by artisanal and industrial miners. The main selection criterion was insufficient receipt of external aid in development. - Village characteristics were recorded with the aid of a data sheet. - Semi-structured interviews. - Focus groups (25 pers./group) with different occupational groups as well as with women and youth specifically. - Participative research methods: Sustainable Means of Existence Approach (AMED) and Rapid Participative research Methods (MARP). - The study target population included people living of various activities, including gold and diamond mining, agriculture, and commerce. - Information from secondary sources and from relevant government offices and other institutions. 	
<p><u>3. Key parameters or characteristics documented and evaluated</u></p> <p>3.1. Legal</p> <ul style="list-style-type: none"> - A national syndicate represent the interests of the diamond mining Masters, and another one of all artisanal gold miners. These syndicates help ASM obtain mining concessions and deal with national mining authorities. <p>3.2. Technical</p> <ul style="list-style-type: none"> - Mine workers are frequently being exploited by the mine owners/operators, called “Masters” in diamond mining. <p>3.3. Economic</p> <ul style="list-style-type: none"> - Est. national number of small scale miners: 100,000, of which 10,000 in gold and diamond mining. - ASM extract annually 2.45 T of gold and 339.900 carats of diamond (state revenue of 578,800 \$) - Type and quantity of live stock - The diamond Master pays each miner 3.5 kg of rice and 1,000 CFA/week, and provides working tools. After subtraction of expenses, revenues are parted between the miner and master in a ratio of 1:8, respectively; - Artisanal gold miners may earn between 5,000-10,000 FG/day; <p>3.4. Environmental</p> <ul style="list-style-type: none"> - Air pollution - Water pollution - Damage to vegetation cover <p>(none were quantitatively measured)</p> <p>3.5. Gender and children participation</p> <ul style="list-style-type: none"> - Women’s groups are active in community development - Women are economically active in various professions including commerce, and work with their partners in agriculture and mining. - Women’s role in political decision making varies between research villages - Youth works in mines throughout the entire dry season 	

<ul style="list-style-type: none"> - Youth concerns (schooling, youth centre, sports facilities) cannot be met due to a lack of funding - In communities with a school, the ratio of boys to girls ranges between 6:1 to 2:1 <p>3.6. Health and safety</p> <ul style="list-style-type: none"> - Number of clinics (incl. private health posts) in the research villages ranges between 0 and 7 - Most common diseases are malaria, respiratory diseases, and STDs - Despite the presence of water taps in most places, cholera and dysentery persist <p>3.7. Community</p> <ul style="list-style-type: none"> - Number of community members in the 4 research villages ranges between 942 to 21,108 - About 60-70% of community members are economically active. - Number of schools in the research villages ranges between 0 and 3 - Number of mosques in the research villages ranges between 1 and 33 - Access to clean drinking water and sanitation is generally inadequate - There is no public electricity net but wealthy families have private generators <p>3.8. Vulnerability</p> <ul style="list-style-type: none"> - Communities heavily depend on ASM for subsistence - Large degree of illiteracy among adults and low school attendance among children. - (Micro)credit and other financing systems are absent in all communities - Few community members have livestock or capital goods.
<p><u>4. Parameters identified as indicators against which change could be measured</u></p> <ul style="list-style-type: none"> - Economically active population - Number of health posts/clinics - Number of people per health care worker - Number of schools - Number (%) of school-aged boys and girls in school - Numbers and type of livestock - Number and type of sources of drinking water in the community - Presence of credit and finance systems
<p><u>5. Limitations identified by original researchers related to data collection and analysis, and scope and extent of coverage</u></p> <ul style="list-style-type: none"> - None
<p><u>6. Recommendations made by original researchers for further evaluation, data collection and/or data analysis</u></p> <p>None for data collection; policy recommendations include:</p> <ul style="list-style-type: none"> - Restoration of abandoned mining pits - Promotion of credit system - Development of rural associations/cooperatives - Stronger integration of women in community decision-making councils - Promotion of durable food security systems
<p><u>7. New, unique or significant attributes of artisanal mining activity identified</u></p> <ul style="list-style-type: none"> - Large diversity in quality of life within and among ASM communities: in some research villages ASM had contributed little to improvement of overall well-being, while in other villages miners associations have sponsored community development projects.

ANNEX II.7: Madagascar 2000/2001

<p>Key aspects of baseline survey</p>	<p>Intermediate Technology Consultants (ITC) and Projekt Consult</p> <ul style="list-style-type: none"> a) Rapport d'enquête de terrain sur les mines à petite échelle à Madagascar (Mai 2000) b) La petite exploitation minière à Madagascar. Etude socio-économique (Mai 2000) c) Etude diagnostique sur l'exploitation minière à petite échelle à Madagascar (Septembre 2000) d) Conditions légales e économiques pour la petite exploitation minière et les industries en aval à Madagascar (Août 2001)
<p><u>1. Objectives of study</u></p> <ul style="list-style-type: none"> - The material collected and compiled was supposed to provide the preliminary study phase as a base for the „Projet d'Assistance Technique aux Petits Exploitants Miniers (PATPEM)“, the ITC/Projekt-Consult project conducted to assist the Department of Energy and Mines of Madagascar 	
<p><u>2. Methodologies and survey techniques employed for data collection and analysis</u></p> <ul style="list-style-type: none"> - Desk study, supported by short fieldtrips and fact-finding missions as well as inputs from other stakeholders. ASM sites were evaluated in four different categories: (a) Stone cutters – of precious stones (les lapidaires), (b) Miners of industrial materials (mainly quartz), (c) Gold miners (orpailleurs), (d) Miners searching for precious and semi-precious stones. 	
<p><u>3. Key parameters or characteristics documented and evaluated</u></p> <p>3.1. Legal</p> <ul style="list-style-type: none"> - Tough new laws are being applied since August 1999; - According to a World Bank estimate of 1998, the illegal trade amounted to \$100 million; other sources say its reached \$200 million - According to some to the estimations, 85% of SSE only pay 5% of taxes; - Majority of miners does not have a permit, does not declare labour and production, and do not pay taxes, because: <ul style="list-style-type: none"> • mining law is complicated and not adapted to needs of small-scale miner • absence of available land for ASM • tradition • lack of law-enforcement by authorities. <p>3.2. Technical</p> <ul style="list-style-type: none"> - No indicators are mentioned; - In mechanized mining of industrial materials (e.g. quartz) about 50% of earnings cover the cost of material (pump). <p>3.3. Economic</p> <ul style="list-style-type: none"> - In the rush zones (Ilakaka, Dabolava) living costs are evaluated at 30-50% higher than elsewhere; Maintenance cost for an adult per day (for food) varies from 2000/2500 to 3000/4000 Fmg, (US\$ 0.30/0.38 to 0.45/0.61); - Salaries offered to casual workers (casual daily employees) in the mines: 10 000-15 000 F mg (US\$ 1.50/2.30) per day for workers at Ilakaka and Sakahara, - These salaries are superior to those of agricultural workers employed by farmers who need labourers: 3000-4000 Fmg (US\$ 0.45-0.61)per day - ASM produce estimated 70% of mining production - Investments depend on the mineral mined, and vary between approx. 0.1-0.5 mln Fmg for those who seek sapphires and other (semi)precious stones, to 3 to 10 mln Fmg for stone cutters, to occasionally over 10 mln Fmg for some industrial stone miners. - Stone cutters and miners of industrial materials often finance their operation out of savings and credit, but small-scale gold and precious stone miners virtually never receive credit. Credit is obtained from either local merchants and intermediaries, or from microfinance organisms <ul style="list-style-type: none"> - Assuming a 6-day working week, and 4 weeks/mo, average monthly revenues of the different mining groups were: <ul style="list-style-type: none"> • stone cutter: 700,000 Fmg/mo • miners of Industrial materials: 48,000 Fmg/mo for wage laborers and 20,000 Fmg for independents • Miners of precious stones: 50,000-200,000 Fmg/mo 	

<ul style="list-style-type: none"> • Artisanal gold miners: 480,000 Fmg/mo <p>3.4. Gender and children participation</p> <ul style="list-style-type: none"> - According to a survey with 300 children, in mines, half the number of children find the job painful and straining. 60% carry loads of 5-10 kg, 25% of more than 10 kg; 44% mention falling down frequently, 72% of children do not attend school and their work duration surpasses for 2/3 of them 6 hrs a day; - 90% of the kids are not paid, yet they contribute 6-10% of the family income; - Rate of school attendance of active kids younger than 14 (30%) equals less than half of the number of kids who do not work (65%); - No significant difference is observed between schooling rate of boys and girls but between schooling rate for urban (81%) and rural (48%); - Finally, there will be no difference between health problems for kids who work and the others. This absence of specific pathology is explicable by the same conditions of poor early life known by the entire population. - Women are involved in processing and transport but not in extracting activities. - Women play an important role especially in (semi) precious stone mining (sapphires), and in relatively smaller mining operations. - Few women obtain in superior positions, they mostly transport, load, crush, sift, and wash the minerals <p>3.5. Environmental</p> <ul style="list-style-type: none"> - No indicators are mentioned. <p>3.6. Health and safety</p> <ul style="list-style-type: none"> - No indicators are mentioned. - High risk of working accidents for adults and children, including collapsing shafts and foundations. In the case of mortal accidents the cooperative (at the site of Ilakaka) pays funeral expenses. - Informal labour is not insured against work accidents (social security system) and products do not attest to (inter)national standards. <p>3.7. Community</p> <ul style="list-style-type: none"> - No indicators are mentioned. - In the most populous mining zones, local people become a minority and often make a living selling services to the miners - ASM often occurs in family units, with wife and children, or by man alone - Community-style solidarity develops among family and other units working the same pit, but miners are seldom organized in a formal umbrella organization – with the exception of one site: Ilakaka. - Buyers of (semi)precious stones and ore are often foreigners, including the Thailand, Sri Lanka, and France. <p>3.8. Vulnerability</p> <ul style="list-style-type: none"> - No indicators are mentioned. - Barriers to advancement of miners: poor formation/education, lack of capital to invest in better material, lack of security, poor health and working conditions
<p><u>4. Parameters identified as indicators against which change could be measured</u></p> <ul style="list-style-type: none"> - Economic: Investment figures.
<p><u>5. Limitations identified by original researchers related to data collection and analysis, and scope and extent of coverage</u></p> <ul style="list-style-type: none"> - No indicators are mentioned. - Due to its informal nature, ASM escapes from national statistics.
<p><u>6. Recommendations made by original researchers for further evaluation, data collection and/or data analysis</u></p> <ul style="list-style-type: none"> - No indicators are mentioned.
<p><u>7. New, unique or significant attributes of artisanal mining activity identified</u></p> <ul style="list-style-type: none"> - None highlighted.

ANNEX II.8.: Malawi 2001

Key aspects of baseline survey	Malawi. In: Drechsler, B. (Editor). Small-scale Mining and Sustainable Development within the SADC Region. MMSD, August 2001.
<u>1. Objective of study</u>	
<ul style="list-style-type: none"> - To characterize the nature and extent of small-scale mining activities in terms of economic, social and environmental impacts and their role within rural sustainable livelihood strategies; 	
<u>2. Methodologies and survey techniques employed for data collection and analysis</u>	
<ul style="list-style-type: none"> - personal interviews with various technical staff at the Department of Mines and the Department of Geological Survey; - review of relevant technical reports available at the two institutions; 	
<u>3. Key parameters or characteristics documented and evaluated</u>	
3.1. Legal	
<ul style="list-style-type: none"> - There is some hostility in gemstone mining between villagers and operators as sometimes customary landowners or ordinary villagers do not want to give access to operators even if they possess the necessary permit from the Mines Department; - Quite a number of women involved in handnapping of stone aggregate operate illegally; 	
3.2. Technical	
<ul style="list-style-type: none"> - All mining activities in the country fall within the small-scale mining category; - Gemstones, stone aggregates, limestone for lime burning, ceramic clays and salt are mined artisanally using picks and shovels for extraction and hammers for rock crushing; 	
3.3. Economic	
<ul style="list-style-type: none"> - Total number of artisanal and small-scale miners is estimated at 40,000; - All small-scale mining activities supplement other incomes, except lime-making which is carried out full-time by about 5,000 people; 	
3.4. Organisational	
<ul style="list-style-type: none"> - there are 5 main formal small-scale mining associations - the government encourages the formation of associations as a way to render more focused assistance and control environmental degradation; 	
3.5. Gender and children participation	
<ul style="list-style-type: none"> - about 300 women involved in lime production formed a lime-making association; - the study notes that quite a number of are involved in handnapping stone aggregate; - there is no documented information on the number of children involved in SSM activities, although it is believed that children do assist; 	
3.6. Environmental	
<ul style="list-style-type: none"> - A major negative aspect of SSM operations has been the damage the operations have caused to the environment; operators need to be educated about the need to rehabilitate mining sites after exploitation; - Demand for firewood in lime-making has resulted in extensive deforestation and land degradation; 	
3.7. Health and safety	
<ul style="list-style-type: none"> - The report does not cover health and safety aspects; 	
3.8. Institutional	
<ul style="list-style-type: none"> - There are insufficient resources at both the Department of Mines and the Geological Department in the field of environmental management, because government in the past did not view mining as an important sector; 	
<u>4. Parameters identified as indicators against which change could be measured</u>	
<ul style="list-style-type: none"> - none; 	
<u>5. Limitations identified by original researchers related to data collection and analysis, and scope and extent of coverage</u>	
<ul style="list-style-type: none"> - none; 	
<u>6. Recommendations made by original researchers for further evaluation, data collection and/or data analysis</u>	
<ul style="list-style-type: none"> - none; 	
<u>7. New, unique or significant attributes of artisanal mining activity identified</u>	
<ul style="list-style-type: none"> - women involved in the mining of gemstones, limestone and salt are organized in the Malawi Association of Women Miners. 	

ANNEX II.9.1.: Mali 2001

Key aspects of baseline survey	Keyta, Sedoe. Study on Artisanal and Small-Scale Mining in Mali. Mining, Minerals, and Sustainable Development project of the International Institute for Environment and Development and the World Business Council for Sustainable Development, August 2001
<u>1. Objective of study</u> - Not stated. Supposedly to provide baseline information	
<u>2. Methodologies and survey techniques employed for data collection and analysis</u> - Not mentioned; secondary data.	
<u>3. Key parameters or characteristics documented and evaluated</u> <u>3.1. Legal</u> <ul style="list-style-type: none"> - ASM is mostly practices illegally. Number of registered miners <= 40% - Between July 1995 and December 1999, the National Directorate of Geology and Mines issued 5,568 gold-washers cards. - More recently, mining cooperatives (38), associations, and economic interest groups (EIG) (12) for ASM have been created. The cooperative s and EIGs typically have between 100 and 120 members. - Historic and current mining laws relevant to ASM are discussed in detail, as well as recent partnerships between traditional miners and larger mining companies <u>3.2. Technical</u> <ul style="list-style-type: none"> - Miners use rudimentary extraction and processing methods, and simple tools s.a. shuffles, pickaxes, buckets. Mechanized equipment is very limited, with the exception of some motor pumps. - Traditional production on a site rarely involves more than half of potential reserves. Losses for gold are estimated at 75% of the metal stock for placer mining, and 90% for a lode. - Outputs rarely exceed 2 - 3 m³/person/day, and drop to 0.1 m³/person/day for heavy jobs like manual quartz crushing. - Material rental (motor pumps) costs up to 30-60% of total production. - Barriers to technological improvement: lack of capital, lack of cultural openings, inability to solve problems and to innovate - Processing methods are crude, recuperations bad, and final products have poor commercial quality. - Crushing outputs are typically < 50 kg/person/day. Small grinding machines that are in use at some sites can increase production to 200 kg/hr. - Losses incurred by grinding operations are estimated to be between 10 and 30% of the mineral stock depending on what mineral is being ground - Concentration of auriferous materials & washing also has low productivity; 150 kg/pan - In washing, recovery appears reasonable for crude gold, but almost nil for fine gold that tends to float. - Changes in the past ten years: demarcation of gold washing sites by government; introduction of sluices by Ghanaian miners, limited mechanization through setting up of joint venture contracts between cooperatives and foreign partners <u>3.3. Economic</u> <ul style="list-style-type: none"> - Focus of ASM activities is gold - An estimated 200,000 people work in gold mining and related activities as their primary occupation. - Officially recorded traditional gold production is approximately 2 tonnes; real ASM gold production may be 5 tonnes. - Traditional mining contributes to improved living standards, increased family incomes, and allows people to pay medical bills, among other things. - Increased number of motorcycles, bicycles, and radio-tape players are evidence of higher incomes at mining sites. - Estimated average per person income = 7 FF/day; average person/day production = 0.16 g for 35 g/yr - There is no tax on gold trade <u>3.4. Environmental</u> <ul style="list-style-type: none"> - Aggressive deforestation, stimulated by the belief that nuggets are found between tree roots - Soil disturbance is virtually irreversible - Pollution by mercury and sediments affects aquatic resources including fauna (fish) - Abandoned sites are unprotected and may contain pits of 50-60 meter camouflaged by standing water or vegetation. - Alluvium mining is associated with river bank destruction and massive sedimentation. - Damage to ground water resources by chemicals and by excessive pumping in mining of deeper primary deposits. 	

<ul style="list-style-type: none"> - Waste, garbage, old batteries, etc are left behind at old sites. <p>3.5. Gender and children participation</p> <ul style="list-style-type: none"> - Participation of women in traditional mining is > 50%. On some sites, women make up 90% of workers involved in drawing and washing. - Manual ore processing is typically the task of women - Children have been observed at mining sites but their numbers are unknown. - Children mainly work in minerals transport and processing, water supply, and baby sitting. Children also work in food preparation and sale; sale of drinks, cigarettes, cake; crushing; milling; pounding; and sieving of minerals. - Children are exposed to health hazards as they work for several hours a day pounding and washing ore. - Babies are exposed to dust and noise caused by pestles. - Among other physical risks and constraints endured by children are: respiratory infections and silicoses; dumbness risk; fatigue; injury; ocular and various dermatological afflictions; child prostitution; and malnourishment. <p>3.6. Health and safety</p> <ul style="list-style-type: none"> - Poor access to water and sanitation - Most sites are far from medical services and clinics - Use of alcohol and drugs including amphetamines and glue - Increase in violence and crime in and around migrant miner settlements - On one surveyed gold mining site AIDS prevalence was 20%; 2 out of 5 other miners suffered from other Sexually Transmitted Diseases (STDs). - Unsafe and unhealthy working conditions lead to frequent disease, of which the most common are: malaria, acute respiratory infection, trauma, diarrhoea, dermatitis and STDs - The diet in mining communities is of poor nutritional quality; malnutrition is common among adults and children. <p>3.7. Community</p> <ul style="list-style-type: none"> - ASM creates jobs in deprived areas, thereby slowing down the rural exodus to urban areas. - Traditional gold washing is organized by the village community, and generally follows established rules and organization of this village community. - Miners settle in temporary villages near extraction sites, finding shelter under branches and straw huts. <p>3.8. Vulnerability</p> <ul style="list-style-type: none"> - Farmers move into ASM because of reductions in agricultural income caused by slums in sales or by bad harvest due to drought. - Children living in mining villages usually do not attend school.
<p><u>4. Parameters identified as indicators against which change could be measured</u></p> <ul style="list-style-type: none"> - Few. Most data is qualitative and anecdotal.
<p><u>5. Limitations identified by original researchers related to data collection and analysis, and scope and extent of coverage</u></p> <ul style="list-style-type: none"> - None
<p><u>6. Recommendations made by original researchers for further evaluation, data collection and/or data analysis</u></p> <ul style="list-style-type: none"> - None explicitly mentioned. The report does note that there are no national statistics on diamond production or on child labor, that statistics on the mining sector are of poor quality due to large-spread illegality
<p><u>7. New, unique or significant attributes of artisanal mining activity identified</u></p> <ul style="list-style-type: none"> - None

ANNEX II.9.2.: Mali 2002

Key aspects of baseline survey	Eradication de la pauvreté et de développement des moyens d'existence durable dans les communautés minières artisanales du Mali. Centre d'Analyse et de Formulation de Politiques de Développement & United Nations Development Programme. RAF/99/023 November 2002
<p><u>1. Objective of study</u></p> <ul style="list-style-type: none"> - Document different dimensions of poverty in ASM communities - Inform policy towards poverty eradication and development of sustainable livelihoods in ASM communities in Mali. <p>Such policy should:</p> <ul style="list-style-type: none"> (a) Identify complementary and alternative sustainable livelihood activities for miners (b) Transform ASM into an economically more viable activity that does not jeopardize other income generating activities. 	
<p><u>2. Methodologies and survey techniques employed for data collection and analysis</u></p> <ul style="list-style-type: none"> - Field research was conducted in five villages in two gold mining regions (Kangaba and Yanfolila), between 24-31 August 2003 <p>A sustainable livelihoods approach (AMED) was used for data collection and analysis of: (a) the context of vulnerability, (b) access to physical, human, social, natural, and financial capital, (c) political institutions and processes that shape livelihoods, (d) strategies employed to reach life goals, and (e) the results obtained or desired using these strategies. Based on AMED, field researchers used the following methods:</p> <ul style="list-style-type: none"> - Surveys with individuals and work teams - Focus groups - Documentation of political and community institutional characteristics - Analysis of secondary data for the region - Semi-structured interviews - Use of Venn-diagrams to reveal links between variables and present the data more systematically. - Classification methods - Quantification techniques to determine rank orders, tendencies, and proportions 	
<p><u>3. Key parameters or characteristics documented and evaluated</u></p> <p>3.1. Legal</p> <ul style="list-style-type: none"> - Traditional community institutions remain respected and regulate life in ASM sites <p>3.2. Technical</p> <ul style="list-style-type: none"> - Two types of traditional production were observed: (a) Family-based, mostly alluvial and alluvium mining with pits to 10-15 m, and (b) team-based exploitation with pits to 30 m deep and 4 by 5 m. - Women wash gold using calabashes, which recovers only an estimated 30-40% of gold. <p>3.3. Economic</p> <ul style="list-style-type: none"> - The village economy is based on agriculture, animal husbandry, fishing, commerce, artisan production, and artisanal gold mining. - Annual ASM production equals close to 3 Tonnes of gold; 10% of national gold production - Different systems are in place to part the ore between the mine owner and pit workers, washers, and other professional groups, depending on what material is parted. - Community members lack the finances to invest in improved efficiency in ASM or alternative livelihood strategies. - The communities lack access to credit or microfinance schemes. - Mining allows people to invest in a family (marriage), equipment, housing, and cattle <p>3.4. Environmental</p> <ul style="list-style-type: none"> - Deforestation, destruction of vegetative coverage, erosion and disturbance of soil composition - Pollution of natural resources and water due to use and spillage of chemicals - Rains flush out and concentrate pollutants that end up in groundwater. - Open pits form breeding grounds for malaria mosquitos - In several communities environmental degradation is severe. <p>3.5. Gender and children participation</p> <ul style="list-style-type: none"> - Men primarily work in the pit; women are responsible for taking the mineral from the mines, transport, and washing ore - For women mining is hard work with little revenue because (a) there is no water in the pits to wash the 	

<p>ore there, (b) one needs to buy a wheelbarrow to transport the ore elsewhere, and (c) gold buyers are dishonest</p> <ul style="list-style-type: none"> - Child labor occurs frequently <p>3.6. Health and safety</p> <ul style="list-style-type: none"> - There is a large difference between sites in the share of people reporting accidents: 5% in Yanfolila and 50% in Kangaba - Malaria (100% vs. 55%), respiratory diseases (75% vs. 23%), and chest pains (56% vs 23%) are more frequent in Kangaba than in Yanfolila, respectively. - 6 % of survey respondents in Kangaba and 14% in Yanfolila has suffered from diarrhoea. <p>3.7. Community</p> <ul style="list-style-type: none"> - Over 200,000 people are involved in artisanal gold mining - Access to electricity varies between communities, between 0% to 8% of households with access - Access to drinking water varies between communities, between 0% to over 50% of households. - Educational attainment varies between community, with between 40-75% of households having no members who have completed elementary school <p>3.8. Vulnerability</p> <ul style="list-style-type: none"> - Miners are both full-time professionals and people who work in the mines to augment their income from other jobs, notably agriculture. - Women say they work in ASM because there are no income-earning alternatives. They are looking for aid to employ alternative activities such as agriculture, horticulture, and commerce, but they do not have contacts with associations that could provide assistance - Despite the importance of artisanal gold mining for the research communities, the activity seems to have aggravated rather than alleviated poverty - People's lack of money to buy tools and inputs (herbicides, pesticides) is a barrier to the development of agriculture into a more profitable sector.
<p><u>4. Parameters identified as indicators against which change could be measured</u></p> <ul style="list-style-type: none"> - Number of people working in small-scale gold mining - Percentage of people who are full-time miners versus those who combine mining with other subsistence activities, notably agriculture - Frequency of certain diseases and accidents (statistics are based on field surveys) - Amount of land owned (ha) - Amount of land dedicated to agriculture (ha) - Number of active pits and shafts in the community - Amount of gold earned per mine owner - % of households with electricity - % of households with access to clean drinking water - Number and type of schools in the area - % of households with members who have completed elementary school - Cash income per working group
<p><u>5. Limitations identified by original researchers related to data collection and analysis, and scope and extent of coverage</u></p> <ul style="list-style-type: none"> - None
<p><u>6. Recommendations made by original researchers for further evaluation, data collection and/or data analysis</u></p> <ul style="list-style-type: none"> - None
<p><u>7. New, unique or significant attributes of artisanal mining activity identified</u></p> <ul style="list-style-type: none"> - Evaluation of the effects of past projects that have promoted small-scale gold mining in the region - Presentation and comparison of (quantitative) data on a variety of indicators of sustainable livelihoods in different mining communities - Explicit and detailed discussion and justification of the methods used. - Explicit discussion of the heterogeneity within and among mining communities.

ANNEX II.10.1.: Mozambique 2000

Key aspects of baseline survey	National Directorate of Mines (Ministry of Mineral Resources and Energy); Artisanal Mining Baseline Survey; Mozambique 2000; Funded by: The World Bank.
<p><u>1. Objective of study</u></p> <ul style="list-style-type: none"> - Describe and assess the organisation and relations of production, processing and marketing in artisanal mining; - Highlight the constraints and problems affecting the sector's development; - Assess the impacts of artisanal mining on the livelihood of the local people, local economy, environment and health; - Make recommendations on how to manage, develop and regulate the sector. 	
<p><u>2. Methodologies and survey techniques employed for data collection and analysis</u></p> <ul style="list-style-type: none"> - The research methods used during the survey included questionnaire, observation, focus group discussion, in-depth personal interviews and review of health records. - The research was carried out in the Country's 4 mayor mining provinces, namely Manica, Tete, Nampula and Niassa. - The target groups were gold (gemstone) miners, community members, community leaders, mineral traders, storeowners or informal sellers 	
<p><u>3. Key parameters or characteristics documented and evaluated</u></p> <p>3.1 Legal</p> <ul style="list-style-type: none"> - Not even 4% of ASM-miners have mining titles <p>3.2 Technical</p> <ul style="list-style-type: none"> - Techniques used are panning, sluice boxes and amalgamation - The report provides detailed percentages of mining and processing methods applied for every province, as well as reasons why these methods are used. <p>3.3 Economic</p> <ul style="list-style-type: none"> - The report provides detailes figures on marketing structures and selling prices for gold and gemstones, the average income-situation for miners as well as an overview on how these income is distributed within the mining comunity. <p>3.4 Environmental</p> <ul style="list-style-type: none"> - See 3.7. Communities <p>3.5 Gender and children participation</p> <ul style="list-style-type: none"> - The study gives figures on women & child-labour in the sector, as well as an overview on gender-specific roles within ASM-activities and communities <p>3.6 Health and safety</p> <ul style="list-style-type: none"> - The study tries to get figures on direct (e.g. mercury) as well as indirect impacts of ASM-activities on health issues within mining communities. <p>3.7 Community</p> <ul style="list-style-type: none"> - The study looks into and tries to get figures on <ul style="list-style-type: none"> ❖ Positive impacts <ul style="list-style-type: none"> - Increased Employment Opportunity " - Improved income - Enhanced local economy ❖ Negative impacts <ul style="list-style-type: none"> - Influx of people into mining sites, and related social and health problems - Loss of agricultural land, loss of natural resources (vegetation, water contamination) - Insufficient employment in artisanal mining communities areas; - Resettlement of miners/families in new areas - Migrants to mining areas (seeking jobs, business, war returnees) - Poor infrastructure - Poor basic social services such as health, education and water supply - Small local business development (stalls, informal market selling) - Loss of natural resources and effects on shortages of firewood supply, reduced forests and bushes and its effect on ethno-botany (traditional herbalists) - Loss of scenic view 	

<p><u>4. Parameters identified as indicators against which change could be measured</u></p> <ul style="list-style-type: none"> - All figures listed above are processed from questionnaires and may be suitable to measure change if future baseline studies are using the same methodology
<p><u>5. Limitations identified by original researchers related to data collection and analysis, and scope and extent of coverage</u></p> <ul style="list-style-type: none"> - The real size and population of the target-group is not known and can be only estimated.
<p><u>6. Recommendations made by original researchers for further evaluation, data collection and/or data analysis</u></p> <ul style="list-style-type: none"> - The study recommends monitoring of the sector's development through regular baseline researches
<p><u>7. New, unique or significant attributes of artisanal mining activity identified</u></p> <ul style="list-style-type: none"> - No significant news

ANNEX II.10.2.: Mozambique 2001

Key aspects of baseline survey	Mozambique. In: Drechsler, B. (Editor). Small-scale Mining and Sustainable Development within the SADC Region. MMSD, August 2001.
<u>1. Objective of study</u> <ul style="list-style-type: none"> - To determine how small-scale mining can best contribute to the regional transition to sustainable development; - To learn about the nature of the small-scale mining and identify approaches and strategies used in dealing with the sector; 	
<u>2. Methodologies and survey techniques employed for data collection and analysis</u> <ul style="list-style-type: none"> - Literature survey with limited fieldwork in the Manica area where field observations and role player interviews were conducted to gather additional information; - Interviews with official from mining authorities; 	
<u>3. Key parameters or characteristics documented and evaluated</u> 3.1. Legal <ul style="list-style-type: none"> - the baseline survey confirmed that less than 10 % of artisanal and small-scale miners hold mining titles; - although the legal framework requires that all gold producers sell their gold to Fundo de Fomento Mineiro (FFM), an estimated 80 % of ASM production of gold is sold to private buyers who offer higher prices than FFM; - the majority of private dealers do not have any licence for trading in minerals to avoid high taxes and are illegal operators; 3.2. Technical <ul style="list-style-type: none"> - Ore is extracted by pitting using picks and shovels, and buckets on ropes for hoisting; - In gold processing locally made sluice boxes, panning and mercury amalgamation are used; - Recovery rates in locally built sluice boxes vary between 20 % and 35 % as most of the fine gold is lost; - Gemstone processing is done by hand sorting based on visual characteristics; 3.3. Economic <ul style="list-style-type: none"> - The closure of larger mining and agricultural companies and long droughts have resulted in ASM becoming one of the main sources of income for local communities; - Over 60,000 people were involved in ASM in 1999 (mainly gold and gemstones); - Gold production is estimated to be 10-15 grams per month per miner (at a price of US\$ 7/gram monthly income would be in the range of US\$ 70-105/miner); 3.4. Environmental <ul style="list-style-type: none"> - The environmental impact of ASM is quite visible and includes soil erosion, destruction of river banks, water contamination, deforestation and mercury discharged into the ecosystem; 3.5. Gender and children participation <ul style="list-style-type: none"> - Women and children make up 1/3 of small-scale miners; - Women are predominantly involved in transporting, washing and panning, as well as food and drink selling; - Children between ages of 6 to 10 are involved in activities similar to those of the women; 3.6. Health and safety <ul style="list-style-type: none"> - Miners are at risk of exposure to mercury and related food contamination; - Many mining community members do not have access to potable water and sanitation in mining camps is poor; 3.7. Institutional and Organizational <ul style="list-style-type: none"> - Mining authorities at the provincial level provide technical assistance to introduce more appropriate and less environmentally harmful mining methods, but do not have enough funds to guarantee regular inspections of the mining sites; - in the major ASM areas, more than 50 % of the miners are self-employed and most of the rest is organized in working groups; 3.8. Community <ul style="list-style-type: none"> - Traditional chiefs exercise some authority in mining communities, e.g. declaring rest and workdays and settling social disputes at camps; 	
<u>4. Parameters identified as indicators against which change could be measured</u> <ul style="list-style-type: none"> - none specifically mentioned; indicators such as income, productivity, recovery and number of people involved, for which data are presented above, could be used; 	
<u>5. Limitations identified by original researchers related to data collection and analysis, and scope and extent of coverage</u> <ul style="list-style-type: none"> - none specifically mentioned; 	

6. Recommendations made by original researchers for further evaluation, data collection and/or data analysis

- the study recommends to do an inventory of the real situation of the ASM sector (number of miners, environmental degradation, market structure, licensing);

7. New, unique or significant attributes of artisanal mining activity identified

- in one ASM area (Munhene, Manica) mechanical equipment offered by a large company was refused, alleging that the spirits did not want any noise caused by machinery;
- cultural barriers hinder women's involvement in ASM, e.g. Niassa women are not allowed to work at the mine site because they attract bad spirits.

ANNEX II.11.: Niger 1999

<p>Key aspects of baseline survey</p>	<p>Alfa, Soumaïla. Child labour in small-scale mines in Niger In: Jennings, N.S. (Ed.). Child labour in small-scale mining: Examples from Niger, Peru & Philippines. International Labour Office. 1999.</p>
<p><u>1. Objective of study</u> General objective: Provide baseline information to aid programs aimed at eliminating child labour in mining. Children working in small-scale mining are not only exposed to immediate risk but they are also jeopardizing their long-term development -- both physical and socio-economic. Specific objectives:</p> <ul style="list-style-type: none"> - reveal the importance of small-scale and artisanal mining in the national economy in general and in the informal sector in particular; - identify the risks of this activity in general and for children in particular; - estimate the number of child workers and their age distribution; - identify the causes and consequences of such children working; and - draw conclusions and make general suggestions in an attempt to resolve the problems identified. 	
<p><u>2. Methodologies and survey techniques employed for data collection and analysis</u></p> <ul style="list-style-type: none"> - Methods are not described. Field visits were paid to four target locations; - Site selection: child labour is documented in small-scale mines in four locations: Boboye (trona); Gaya (salt); Madaoua (gypsum); the department of Tillabéri (gold). Trona and salt have been selected because they are mined or quarried in most of Niger and therefore involve many workers, including women and children. Gypsum has been chosen because it is used for the country's only cement works. Gold has been selected because of its importance in the Liptako subregion (covering Niger, Mali and Burkina Faso) but also, mainly, because of the significant risks that gold panning entails. 	
<p><u>3. Key parameters or characteristics documented and evaluated</u></p> <p>3.1. Legal</p> <ul style="list-style-type: none"> - Gypsum mining differs from the mining of trona, salt, and gold, in that small-scale artisanal operations operate in a formal and legal manner. <p>3.2. Technical</p> <ul style="list-style-type: none"> - Miners use relatively simple tools; scrapers and hoes; picks; mine bars; buckets; shovels; axes and machetes; and millet stalks and wood for heating. - Transport of ore and other materials occurs by donkey or human labour. - To extract gold, open-pit mining is carried out either by surface excavation (<20 m), by vertical or inclined shafts (up to 50m), or by trenching (figure 3). Underground mining is used when the ore is more than 20 metres deep. <p>3.3. Economic</p> <ul style="list-style-type: none"> - After agriculture and animal husbandry, mining is the mainstay of Niger's economy - Estimated average family income from trona mining is 100,000 CFA (~1000 FF) per year - Estimated average income from trona mining is 160,000 CFA Francs per family per year. The income from salt mining is better than that from trona mining but families in Foga (salt) are three times as large as in Boboye (trona). - Revenues from gypsum mining are low (no numbers mentioned). - Monthly incomes from gold mining can vary from zero to 1 million CFA Francs - Trona and gypsum mining occur year-round and are the main subsistence activity for those involved. Gold and salt mining are seasonal activities that generate extra income to those making a living of agriculture and animal husbandry . - Children (and adults) risk not being paid for work that is paid on credit, such as water fetching (2,000 CFA/trip), food selling, and prostitution among girls. - The département of Tillabéri, where gold panning is carried out, is regarded as the country's poorest, with a poverty incidence of 80%. <p>3.4. Environmental</p> <ul style="list-style-type: none"> - not discussed. <p>3.5. Health and safety</p> <ul style="list-style-type: none"> - Health problems in the four types of mining: back pains; injuries from work-tools; asthenia (general fatigue); illnesses related to malnutrition that exacerbate less serious infections; severe pneumonia and ear, nose and throat infections; dry and cracked skin, especially during the cold period. - There are no specific legal provisions or regulations protecting workers against occupational risks. Mines 	

<p>inspectors have not visited some mine sites for many years, and others never.</p> <ul style="list-style-type: none"> - Worker's safety is poor. Workers have no group or individual protective equipment. <p>Trona mining:</p> <ul style="list-style-type: none"> - According to a sample of 100 miners (70 children and 30 adults), the number of mining-related accidents to children in 1995-97 was 21 (10% a year) and 15 to adults (16% a year). - Among mining-related illnesses, there were 6,867 consultations for children under 15, and 4,009 for those in the ages 15-18. <p>Gold mining</p> <ul style="list-style-type: none"> - Gold panning is one of the most arduous, dangerous and uncertain of all activities. - Frequent work accidents due to blocks of ore being dropped, tunnels collapsing and workers falling from ladders. A collapsing trench killed 27 people in 1998; underground drift mining led to the deaths of 23 gold panners, including children. - The crushing and grinding are extremely noisy operations and can cause ear damage and washing the ore in polluted rivers causes bilharziosis. - Drugs are taken by both boys and girls. - Some mining communities are more than 200 km removed from health care facilities with poor road conditions. <p>3.6. Women and children</p> <ul style="list-style-type: none"> - An estimated 47% of workers in ASM are children (<18 years of age) - ASM employ almost 70,000 children across the nation, and if small-scale quarries are included, 250,000 children. - Children participate in most of the production cycle, often in hazardous and physically strenuous activities. - Children work at least eight hours a day, their activities depending on sex and age - An estimated 10,000 children worked in trona mining in Birni Ngaouré district; about 1,620 children worked the salt deposits in Tounouga; An estimated 60% of the total number of Gypsum mine workers (N=360) at the study site were children; 5,100 children pan for gold in Niger (17% of work force) - Extracting the trona and salt is performed almost exclusively by children and women. - Processing trona is done by women and by girls aged 14-17, notably the heating, which presents a danger of scalding from the hot water and risk of fire. - Although among the adults, more women than men are involved in gypsum mining, among the children, more boys are involved than girls. <p>Gold mining:</p> <ul style="list-style-type: none"> - Miners working the shaft or removing the extracted material from the bottom are usually children of 14 to 17 years of age, who form a chain on a rope ladder with wooden rungs. - The majority of child workers are boys aged from 14 to 17: 25% of them are used as ore carriers and 10% as water carriers and sellers. Girls sell food (6% of children); 8% of children engage in prostitution, or probably more than 50% of girls. <p>3.7. Community</p> <ul style="list-style-type: none"> - In Birni Ngaouré district (trona mining) the proportion of the population with access to a health facility is 39% and the school attendance rate is 15%. - In Madoua district (Gypsum mining), the proportion of the population with access to a health facility is 63%, and the school attendance rate is 21%. - In the department of Tillabéri, the proportion of the population with access to a health facility is 30% and the school attendance rate is 28%. - Gold mining seasonally employs tens of thousands of workers, of whom more than 10% come from other regions of Niger and neighbouring countries, particularly Burkina Faso and Mali. <p>3.8. Vulnerability</p> <ul style="list-style-type: none"> - Poor families are in a vicious circle comprising poverty, child labour, constraints on school attendance and therefore on development and freedom, abject poverty, and children required to work to ensure enough to live on. - Low school attendance (27%); children who do not attend or who have left school looking for work or used in various informal activities, including the most dangerous, working in small-scale mines.
<p><u>4. Parameters identified as indicators against which change could be measured</u></p> <ul style="list-style-type: none"> - see 3
<p><u>5. Limitations identified by original researchers related to data collection and analysis, and scope and extent of coverage</u></p> <ul style="list-style-type: none"> - not mentioned
<p><u>6. Recommendations made by original researchers for further evaluation, data collection and/or data analysis</u></p> <ul style="list-style-type: none"> - Given that gold mining involves the most intolerable forms of child labor and working conditions, the report recommends undertaking an in-depth study to better outline the problems and propose more effective solutions for

this sector

7. New, unique or significant attributes of artisanal mining activity identified

- Study provides a detailed qualitative description as well as quantitative data on child labour in mines, including the number of accidents, mining-related illness, family earnings, and so forth.

ANNEX II.12: South Africa 2001

Key aspects of baseline survey	South Africa. In: Drechsler, B. (Editor). <i>Small-scale Mining and Sustainable Development within the SADC Region</i> . MMSD, August 2001.
<u>1. Objective of study</u>	
- To characterize the nature and extent of small-scale mining activities in terms of economic, social and environmental impacts and their role within rural sustainable livelihood strategies;	
<u>2. Methodologies and survey techniques employed for data collection and analysis</u>	
- not specifically mentioned; apparently a desk study and literature survey with limited field work;	
<u>3. Key parameters or characteristics documented and evaluated</u>	
3.1. Legal	
- the study reviews legislative arrangements and the regulatory environment and states that a lack of any clear policy or guidelines for the small-scale mining sector is notable;	
- all small-scale mining operations applying for prospecting or mining permits are forced to pay a deposit for rehabilitation; many find this burdensome which leads to non-registration or illegal mining;	
3.2. Technical	
- most small-scale mining operations in South Africa are artisanal relying on little more than pick-and-shovel methods;	
- in diamond panning small-scale miners in the Northern Cape were recovering little over 50-60 % of the potential carats per ton;	
3.3. Economic	
- small mines category (defined as any mine with < 50 employees) contributes 1.1 % to total industry employment and 2.5 % to total industry revenue;	
- small-scale mining is also seen as a means of alleviating rural poverty, which is a particular government focus;	
3.4. Organizational	
- a number of small-scale mining associations exist in South Africa, and there is also a move to coordinate associations at the national level;	
3.5. Gender and children participation	
- The study does not provide data on this aspect but describes the case of a brick-making operation in Kwa Zulu Natal which has sustained the village of Ozizweni for the past 20 years, and in which the mining is mainly done by women and children in an informal way;	
3.6. Environmental	
- the study does not provide data on this aspect but mentions that small-scale miners find it almost impossible to adhere to environmental impact assessment requirements;	
- the study also refers to the brick-making operation in Ozizweni, stating that the whole area is an environmental and health and safety disaster;	
3.7. Health and safety	
- See 3.6. above;	
3.8. Institutional	
- the National Steering Committee of Service Providers to the Small-scale Mining Sector (NSC) was started to provide technical, managerial and financial support for small-scale mining projects;	
<u>4. Parameters identified as indicators against which change could be measured</u>	
- none;	
<u>5. Limitations identified by original researchers related to data collection and analysis, and scope and extent of coverage</u>	
- none;	
<u>6. Recommendations made by original researchers for further evaluation, data collection and/or data analysis</u>	
- none;	
<u>7. New, unique or significant attributes of artisanal mining activity identified</u>	
- in some cases artisanal miners are used as fronts for money-laundering and other criminal activity;	
- the study illustrates cases in which large mining companies (Samancor, De Beers) have entered into agreements with small-scale mining groups, whereby the latter are allowed to mine on the properties of the former in exchange for an ore supply agreement.	

ANNEX II.13.1.: Tanzania 1993

Key aspects of baseline survey	J. Hollaway and Associates. Small Scale Mining in Tanzania. A Technical Assessment. UNDP Project URT/90/020. April 1993.
<u>1. Objective of study</u> - identification of equipment and methods useful in improving the performance of the small scale mines, together with policy recommendations directed at assisting the evolution of this sector into a formal indigenous mining industry.	
<u>2. Methodologies and survey techniques employed for data collection and analysis</u> - combination of interviews and field survey; - visits to 24 mines and discussions with over 60 government officials, claim holders, subcontractors and miners.	
<u>3. Key parameters or characteristics documented and evaluated</u> 3.1. Legal - There was much evidence of smuggling in the marketing of gemstones; - Essentially all the diamonds found are being purchased by illegal buyers who often finance the miners against future discoveries. 3.2. Technical - Small scale gold miners are in a technical and financial trap that prevents them from exploiting their discovery fully; - The most common problems encountered in small scale underground gold mining are water, ventilation and ore hoisting which contribute to making the mines rather transient; - With current processing methods most of the fine gold below 50 microns is lost. 3.3. Economic - Small scale miners account for about 90 % of current mineral exports worth approx. US\$ 50 million; - Between 50.000 and 100.000 people are working in small scale gold mining; - The income of small scale gold miners is very good for rural areas and they are normally unwilling to go back to farming; - In gold mining an average claim earns about US\$ 40,000/year of which the claim holder collects 30 % or US\$ 12,000 annually (official registering the claim are earning about 1/20 of this); 3.4. Gender and children participation - women are active in all peripheral work as well as in heavy work such as rock breaking and grinding; 3.5. Environmental - In gold mining, mercury is a serious concern; - About 3 tons of mercury are being dispersed into the environment every year; - Probably the most serious problem is the large number of unprotected pits in the mining regions presenting a grave hazard; 3.6. Health and safety - Males in gold rush areas have considerable disposable income and consequently prostitution is a significant enterprise; - Gold rush villages have little in the way of formal sanitary requirements and lack of potable water is a concern; - Airborne dust from drilling and crushing without water is a prime source of silicosis. 3.7. Institutional - Regional and district offices lack transport facilities to regularly visit mines which is one of the reasons why claim registration is slow and many accidents go unreported and are not investigated;	
<u>4. Parameters identified as indicators against which change could be measured</u> - The study does not identify specific indicators.	
<u>5. Limitations identified by original researchers related to data collection and analysis, and scope and extent of coverage</u> - The study does not identify specific limitations.	
<u>6. Recommendations made by original researchers for further evaluation, data collection and/or data analysis</u> - The study does not make specific recommendations for further evaluation.	
<u>7. New, unique or significant attributes of artisanal mining activity identified</u> - the great virtue of small scale gold miners is not their mining activity as such, it is their unrivalled ability to find potential mines; - the scale of the discoveries of the miners far exceeds their ability to exploit them.	

ANNEX II.13.2.: Tanzania 1996

Key aspects of baseline survey	TAN DISCOVERY. Baseline Survey and Preparation of Development Strategy for small Scale and Artisanal Mining Program. The World Bank. November 1996.
<u>1. Objective of study</u> - To provide reliable quantitative information on the current position and performance of the artisanal and small scale mining activities	
<u>2. Methodologies and survey techniques employed for data collection and analysis</u> - Combination of literature review and extensive field survey of ASM sites - Field surveys of 108 mines sites, including gold, gemstone and industrial minerals operations - Interviews with policy makers, implementing agencies and individual miners using questionnaires and census sheets - Laboratory analyses	
<u>3. Key parameters or characteristics documented and evaluated</u> <u>3.1. Legal</u> - Less than 1 % of the mining groups operate under a formal enterprise system, about 2 % are in a loose form of co-operative; - 60 % of the recovered gemstones and 70 – 85 % of the gold produced is currently being smuggled out of the country. <u>3.2. Technical</u> - Mining methods applied are not appropriate; - Due to inadequate processing techniques gold recovery is only about 50 % in artisanal operations; - Average gold contents in tailings range from 10 to 47 g/t - Productivity is very low; average productivity in gold ore mining is 90 kg/person-day; in gemstone ore mining it is 27 kg/person-day. <u>3.3. Economic</u> - the number of artisanal miners has increased from 150,000 in 1987 to 550,000 in 1996 - an average gold claim holder expects to earn between US\$ 200 – 1,000 per month, a gemstone mine worker can earn more than US\$ 800 / month in good alluvial ground; - villages near mining areas benefit from selling food stuff which were originally not common cash crops; - most artisanal and small scale miners do not qualify for lending from financial institutions. <u>3.4. Gender and children participation</u> - about ¼ of the artisanal/small scale miners are female - in gold mining of alluvial deposits women earn US\$ 20-400/month - children are engaged in alluvial mining and in processing of tailings - where children are involved in underground mining, they are not assigned heavy duties. <u>3.5. Environmental</u> - An estimated 16,000 ha were destroyed by formal and informal artisanal miners. <u>3.6. Health and safety</u> - Poor air quality with high levels of particulates were observed in underground mining - The survey showed that frequently occurring diseases included diarrhoe, malaria, eye diseases and upper respiratory infections; - Two thirds of amalgamating gold miners had mercury levels below maximum tolerable limit. <u>3.7. Institutional</u> - Zonal mine offices have insufficient budgets to maintain vehicles and cover travelling expenses;	
<u>4. Parameters identified as indicators against which change could be measured</u>	
3. The study does not present specific indicators.	
<u>5. Limitations identified by original researchers related to data collection and analysis, and scope and extent of coverage</u>	
4. lack of statistical data on the economic linkages of artisanal mining with the rural economy.	
<u>6. Recommendations made by original researchers for further evaluation, data collection and/or data analysis</u>	
5. there is a need for a detailed study to assess the effects of children participation in mining; - additional research on the health hazard of mercury contamination in artisanal gold mining.	

7. New, unique or significant attributes of artisanal mining activity identified

- miners generally have higher incomes than villagers;
- due to their high incomes, miners are inclined to promiscuity.

ANNEX II.13.3.: Tanzania 1997

Key aspects of baseline survey	Mutagwaba, W.K., R. Mwaipopo-Ako and A.L. Mlaki. The Impact of Technology on Poverty Alleviation: A Study of Artisanal Mining in Tanzania. State Mining Corporation. July 1997.
<p><u>1. Objective of study</u></p> <ul style="list-style-type: none"> - Identification of technological problems facing artisanal mining, including techniques and equipment used in mining and beneficiation, geological information, appropriate mining and processing tools, existing capacity for fabrication of working tools, strategies for improving miners' knowledge and skills - Exploration of socio-economic aspects related to artisanal mining and their inter-relationship with technological issues identified with the above mentioned issues. 	
<p><u>2. Methodologies and survey techniques employed for data collection and analysis</u></p> <ul style="list-style-type: none"> - Literature review on poverty, technology and artisanal mining - Field survey of 2 gold mining and 3 gemstone mining areas, including focus group discussions and interviews with a variety of actors involved in artisanal mining, participant observation and discussions with strategic informants (local authorities, government officials and institutions) 	
<p><u>3. Key parameters or characteristics documented and evaluated</u></p> <p>3.1. Legal</p> <ul style="list-style-type: none"> - Small-scale mining is defined in the Small-scale Mining Policy of September 1983 - artisanal mining areas are limited to indigenous Tanzanians only - mineral rights for artisanal miners are issued for a period of one year only, which is a limiting factor in obtaining loans - major conflicts arise from the traditional vs. modern interpretation of land rights and the fact that mining rights are overriding other land ownership rights - price for gold offered by banks is only about 60 % of world market price, leading to informal marketing of artisanal gold; <p>3.2. Technical</p> <ul style="list-style-type: none"> - Problems noted at every level of artisanal mining are associated with a lack of technical know-how, of appropriate working tools and technology and a chronic shortage of capital; - Working methods in all visited areas are labor-intensive and use inferior tools most of which are fabricated on site; - hard rock gold ore mining is carried out using hammers, chisels and picks in vertical pits up to 150 m; - lack of adequate ventilation; occasionally manually driven fans are used for ventilation of pits; dewatering of pits with buckets and ropes is inadequate; for ore hoisting buckets on ropes and manual winches are employed; - gold ore crushing and grinding is done manually using mortars and grinding stones; crushed ore is concentrated by panning ore sluicing; gold is recovered by mercury amalgamation; - mining productivity ranges from 8 to 106 kg/man-day, processing productivity from 8 to 11 kg/man-day; - in gemstone mining ore is extracted by drilling and blasting with some of the pits using drilling machines and compressors; <p>3.3. Organizational</p> <ul style="list-style-type: none"> - the typical organizational structure encompasses three levels of actors, i.e. claim holders who lease their claims to pit owners, who assemble a team of mine workers to carry out the mining; claim holders usually get 30%-40% of earnings, leaving 60%-70% to pit owners and mine workers; - Regional Miners Associations (REMAS) have been formed in every region with active mining, to unite and advise miners and serve their interests; reportedly REMAS have hardly served their objectives due to low financial capacity and weak leadership; <p>3.4. Economic</p> <ul style="list-style-type: none"> - In gold mining income is reported to be in the range of US\$ 500-1,660 per miner per season; - In artisanal diamond mining normal income ranged from US\$800-1,600 per person per 6-months period; - Artisanal mining provided a significant source of employment to women, youths and the rural unemployed population; <p>3.5. Gender and children participation</p> <ul style="list-style-type: none"> - Women are involved in artisanal mining both as service providers, i.e. selling food and water to mine workers, operating guest houses and bars and providing social amenities, as well as in mining and 	

<p>processing operations;</p> <ul style="list-style-type: none"> - In alluvial mining, usually family groups are involved, including children and old people; - The reprocessing of tailings at old mines or existing formal mines is dominated by women and children;
<p><u>3.6. Environmental</u></p> <ul style="list-style-type: none"> - Major environmental effects observed and reported include land degradation resulting from pits and dumps, loss of agricultural land due to blanketing of the top soil with waste rock, the high demand for wood leading to deforestation, and mercury amalgamation polluting the environment; - the report does not provide quantitative data on environmental effects; <p><u>3.7. Health and safety</u></p> <ul style="list-style-type: none"> - Although data are not presented, the report indicates that the rate of mining accidents in pits is low compared to the health hazards and illnesses occurring in the settlements; - Most settlements are overcrowded and lack adequate sanitation facilities; - Dust from crushing and grinding carried out in living quarters is a visible health hazard; - Gold miners were observed having direct contact with mercury; <p><u>3.8. Institutional</u></p> <ul style="list-style-type: none"> - Mining authorities have failed to cope with the rapidly expanding artisanal mining activities in terms of technical, regulatory and financial assistance; - Although 8 Zonal and 14 District Mining Offices are located in the mining regions, lack of working resources has constrained their ability to monitor and inspect mine workings and provide technical support;
<p><u>4. Parameters identified as indicators against which change could be measured</u></p> <ul style="list-style-type: none"> - The study recommends that environmental indicators should be put in place so that regulations can be enforced through monitoring and inspection; - indicators like income and productivity for which some data have been reported, can be used;
<p><u>5. Limitations identified by original researchers related to data collection and analysis, and scope and extent of coverage</u></p> <ul style="list-style-type: none"> - lack of reliable data on health and safety;
<p><u>6. Recommendations made by original researchers for further evaluation, data collection and/or data analysis</u></p> <ul style="list-style-type: none"> - a detailed study on the role and status of women in gold and gemstone mining - research to explore the causes of child labor and ways of tackling this problem in artisanal mining;
<p><u>7. New, unique or significant attributes of artisanal mining activity identified</u></p> <ul style="list-style-type: none"> - most of the miners are local people and an estimated ¼ come from other regions in Tanzania; - the surrounding villages have benefited economically from artisanal/small-scale mining; - experience has shown that some of the mining camps develop into permanent settlements or villages when people invest in personal property like housing, transport and other businesses, and public services (health and education) follow; - artisanal mining can be seen as an avenue for raising living standards through offering opportunities for gainful employment in the rural areas.

ANNEX II.14.1.: Zambia 2001

Key aspects of baseline survey	Zambia. In: Drechsler, B. (Editor). Small-scale Mining and Sustainable Development within the SADC Region. MMSD, August 2001.
<u>1. Objective of study</u>	
- To characterize the nature and extent of small-scale mining activities in terms of economic, social and environmental impacts and their role within rural sustainable livelihood strategies;	
<u>2. Methodologies and survey techniques employed for data collection and analysis</u>	
- not specifically mentioned; apparently a desk study based on a literature survey;	
<u>3. Key parameters or characteristics documented and evaluated</u>	
3.1. Legal	
- Small-scale mining licences are issued for areas not exceeding 400 hectares and for a term of 10 years renewable;	
- Artisan Mining Rights give local people the right to mine an area not exceeding 5 hectares for a period of 2 years, non-renewable;	
- illegal miners scavenge on already developed mines by secretly transporting material suspected to be containing emeralds in sacks to places where washing and recovery can be done at night;	
3.2. Technical	
- Techniques used in artisanal mining are inefficient and relatively unproductive (study does not contain data on productivity);	
- Artisanal operations tend to be labour-intensive using simple tools, mainly steel picks, hammers, shovels and wheelbarrows;	
- Mining is based on surface chance finds resulting from random pitting and trenching and comprise irregular diggings using steel pick, hammer and chisel;	
3.3. Economic	
- the sector is dominated by mining of gemstones, namely emeralds, amethysts, aquamarines, beryls and garnets;	
- gemstone mining contributes about 25 % of total mineral production (the report does not state how much of the gemstones come from ASM operations);	
3.4. Gender and children participation	
- Data on the number of women engaged in small-scale mining are not available;	
- By its nature gemstone mining does not encourage child labour;	
3.5. Environmental	
- environmental destruction is the single most visible aspect of small-scale mining;	
- effects include soil erosion, siltation of rivers and degradation of land due to waste dumps;	
3.6. Health and safety	
- Unprotected excavations in terms of unfenced shafts, trenches and pits were a concern to the safety of humans and animals (the study does not provide specific data);	
3.7. Institutional	
- Implementation of legislation suffers from inadequate manpower to realize the objectives of the various departments;	
<u>4. Parameters identified as indicators against which change could be measured</u>	
- None specified;	
<u>5. Limitations identified by original researchers related to data collection and analysis, and scope and extent of coverage</u>	
- Lack of data on women participation in mining;	
<u>6. Recommendations made by original researchers for further evaluation, data collection and/or data analysis</u>	
- None;	
<u>7. New, unique or significant attributes of artisanal mining activity identified</u>	
- small-scale mining has developed its own economic and political enclave, decoupled from the rest of the economy by its specific requirements and nature;	
- activity in the sector is clandestine and the miners, buyers, government and other stakeholders do not trust each other.	

ANNEX II.14.2.: Zambia 2002

Key aspects of baseline survey	Tyler Associates. Review of Zambia Gemstone Sector and Development Strategy. Prepared for The World Bank, July 2002.										
<p><u>1. Objective of study</u></p> <ul style="list-style-type: none"> - To provide an overview of the potential of Zambia's gemstone sector. - To demonstrate the potential to increase value-added production in the gemstone sector and determine the sector's feasibility in generating export earnings and employment. - Based on analyses and review of existing donor initiatives (EU & USAID), recommend what steps need to be taken by the Zambian government and/or the private sector to realise the potential of the sector. 											
<p><u>2. Methodologies and survey techniques employed for data collection and analysis</u></p> <ul style="list-style-type: none"> - Interviewing stakeholders like <ul style="list-style-type: none"> - "local players" - foreign firms which have failed to develop opportunities in Zambia - foreign producers - Desk study <ul style="list-style-type: none"> - researching the market demand for gemstones and added value products - reviewing other 'new-entrant' countries - researching the existing background, environment and performance of the Zambian gemstone sector - reviewing existing EU and USAID initiatives - researching taxation policies which may be inhibiting trade from being more formal. - Participation in the "Export Diversification Workshop" and further analyzing its results. 											
<p><u>3. Key parameters or characteristics documented and evaluated</u></p> <p>3.1. Legal</p> <ul style="list-style-type: none"> - Weaknesses in the legislation and administration of the sector have been identified, which hampers investment, increases un-professionalism and inefficiency, - Relevant regulations have not been passed seven years after the Mining Act, - Its provisions cannot be implemented due to lack of resources and commitment - 98% of licenses are considered dormant, - Government policy does not treat the gemstone sector either as traditional or non traditional export sector and it suffers the worst features of both. - "The professional are hassled while the un-professional roam free....." <p>3.2. Technical</p> <ul style="list-style-type: none"> - Lack of affordable appropriate equipment is seen as the biggest problem by the miners themselves, - Inappropriate mining methods (e.g. bad blasting techniques) are destroying value. (three quarters of emeralds are reduced by up to 50% in value), - Open pit mining is practised, even if underground mining would be much more appropriate, <p>3.3. Economic</p> <ul style="list-style-type: none"> - High mining costs, limited infrastructure and limited access to finance are seen as the main problems for the ASM sector to grow. <ul style="list-style-type: none"> - interest rates are up to 60% - mining costs for emeralds are 40% more than in Columbia - The four biggest mines are on a average remote from <table border="0" style="margin-left: 20px;"> <tr> <td>a metalled road</td> <td>62km</td> </tr> <tr> <td>electricity</td> <td>33km</td> </tr> <tr> <td>water</td> <td>10km</td> </tr> <tr> <td>clinic</td> <td>42km</td> </tr> <tr> <td>school</td> <td>13km</td> </tr> </table> <p>3.4. Environmental</p> <ul style="list-style-type: none"> - Not covered by the study <p>3.5. Gender and children participation</p> <ul style="list-style-type: none"> - Not covered by the study <p>3.6. Health and safety</p>		a metalled road	62km	electricity	33km	water	10km	clinic	42km	school	13km
a metalled road	62km										
electricity	33km										
water	10km										
clinic	42km										
school	13km										

<ul style="list-style-type: none"> - Not covered by the study
<p>3.7. Community</p> <ul style="list-style-type: none"> - Not covered by the study
<p>3.8. Vulnerability</p> <ul style="list-style-type: none"> - Not covered by the study
<p><u>4. Parameters identified as indicators against which change could be measured</u></p> <ul style="list-style-type: none"> - The study uses export figures , according to value, in-country value adding, and destination (high-value (e.g. USA, Germany) and low-value destinations (e.g. India, China) - percentage of dormant licenses
<p><u>5. Limitations identified by original researchers related to data collection and analysis, and scope and extent of coverage</u></p> <ul style="list-style-type: none"> - Due to the mainly informal character of mining and marketing of gemstones, the official export figures do not reflect the real situation
<p><u>6. Recommendations made by original researchers for further evaluation, data collection and/or data analysis</u></p> <ul style="list-style-type: none"> - The study does not present specific recommendations.
<p><u>7. New, unique or significant attributes of artisanal mining activity identified</u></p> <ul style="list-style-type: none"> - Government policy does not at all encourage the ASM sector to become more formal (No carrot, not even stick).

ANNEX II.15.: Zimbabwe 2001

Key aspects of baseline survey	Zimbabwe. In: Drechsler, B. (Editor). <i>Small-scale Mining and Sustainable Development within the SADC Region. MMSD, August 2001.</i>
<u>1. Objective of study</u>	
<ul style="list-style-type: none"> - To characterize the nature and extent of small-scale mining activities in terms of economic, social and environmental impacts and their role within rural sustainable livelihood strategies; 	
<u>2. Methodologies and survey techniques employed for data collection and analysis</u>	
<ul style="list-style-type: none"> - not specified, but apparently a desk study and literature survey; 	
<u>3. Key parameters or characteristics documented and evaluated</u>	
3.1. Legal	
<ul style="list-style-type: none"> - Gold production has to be declared to the Ministry of Mines and sold to the Reserve Bank; - The Gold Trade Act only allows legally registered mine owners to sell gold to the Reserve Bank; for logistical reasons only minimum quantities of 50 g are accepted; these requirements in practice leave artisanal informal miners no option but to sell through illegal channels; - Under the Mining (Alluvial Gold) (Public Stream) Regulations, 1991, the Rural District Councils are empowered to issue permits to local permanent residents and to monitor and control gold panning in designated areas; 	
3.2. Technical	
<ul style="list-style-type: none"> - in artisanal gold mining the mineral is recovered by hand panning; occasionally mercury is added to the pan to enhance recovery; - gold reef deposits are mined by small companies, co-operatives or individuals; nearly all operations employ low levels of mining technology resulting in low productivity of 0.2 tons of ore per man-shift; - the Shamva Mining Centre established to provide custom milling on a commercial basis was successful for many years because it addressed a real need of small-scale miners through improvement of access to processing technology; 	
3.3. Economic	
<ul style="list-style-type: none"> - the formal small-scale subsector comprises 20,000 registered mining claims of which 10 % are active, employing 40,000 to 60,000 people; - there are about 300,000 informal small-scale and artisanal operators, who are primarily unregistered gold panners and diggers scattered along 5,000 km of Zimbabwe's main rivers; - SSM contributes about 40 % of the chromite and 15 % of the gold output; - The sector has strong forward and backward linkages into both the agricultural and manufacturing sectors; 	
3.4. Gender and children participation	
<ul style="list-style-type: none"> - In formal small-scale mining about 10 % (i.e. about 3,000) are women; - In artisanal gold mining at least 50 % or more than 150,000 are believed to be women and children; women are involved in gravity concentration of gold bearing material and in the supply of water; 	
3.5. Environmental	
<ul style="list-style-type: none"> - small-scale and artisanal miners only occupy about 0.005 % of the total land in use, but they move about 10 million tons of rock material per year, leading to land degradation as unprotected pits and trenches are left behind; - gold panners move 8 million tons of material per year, destroying river banks and resulting in siltation; - it is estimated that small-scale gold miners use about 6 tons of mercury per year, 50 % of which is lost; 	
3.6. Health and safety	
<ul style="list-style-type: none"> - 20-30 people are reportedly killed in small-scale mining every year due to rockfalls and cave-ins; due to the illegal nature of the operations they are not recognized as mine fatalities; - In a sample of miners examined for mercury poisoning, 40 % had high levels of mercury in the hair, while 30 % had high levels in the blood; 	
3.7. Institutional	
<ul style="list-style-type: none"> - the existing institutional framework is inadequate to deal with the small-scale mining sector due to a lack of capacity and resources; - The National Miners' Association (with a membership of about 5,000) represents the views and aspirations of small-scale miners; Zimbabwe Women's Trust represents small-scale women miners; 	
<u>4. Parameters identified as indicators against which change could be measured</u>	
<ul style="list-style-type: none"> - None specifically identified, but number of claims, quantity of gold sold through official channels, and productivity could be used; 	

<p>5. <u>Limitations identified by original researchers related to data collection and analysis, and scope and extent of coverage</u></p> <ul style="list-style-type: none"> - quantifying the commercial contribution of the activity to national economy as long as the sector remains informal;
<p>6. <u>Recommendations made by original researchers for further evaluation, data collection and/or data analysis</u></p> <ul style="list-style-type: none"> - gathering data on female participation in mining and a comparison of their roles;
<p>7. <u>New, unique or significant attributes of artisanal mining activity identified</u></p> <ul style="list-style-type: none"> - informal small-scale gold miners are highly nomadic and have no permanent infrastructure, such as houses; - the strong growth of artisanal gold mining is a result of distress situations in the 1990s, notably the economic structural adjustment programme implemented by the government and regional droughts affecting agricultural yields; - it is commonly accepted that small-scale and artisanal mining has enormous potential for absorbing greater numbers of people in productive employment.

ANNEX III: Common Terms of Reference for MMSD Regional Study

Common Terms of Reference for Regional/Country Studies on Artisanal and Small-Scale Mining for the MMSD Project Prepared by J. Davidson

This outline is based on Latin American and Southern African plans for work on SSM, the SSM global report objectives and recent discussions between researchers in London following the CASM meeting

The Research Challenge

In this exercise, it will be important to try to capture as best as possible an understanding of the variety of realities and faces of artisanal and small-scale mining, as practiced in the various countries and regions being studied. We also want to provide examples of how artisanal/small-scale mining can adapt and progress with the times.

Research foci were identified during regional and international discussions, which occurred between December 2000 and March 2001. They will hopefully provide a common basis for the reporting of information and evaluation of trends between regions in the MMSD global report. The common terms of research do not prevent a regional initiative from collecting additional information or analyzing additional topics or themes. The list of tasks on first glance may appear to be extensive, but some of the indicated work should be fairly straightforward, especially those tasks which involve the identification and referencing of documents (I and V), or the identification and documentation of specific events, projects or persons (IV, VI, VII and VIII). Task II, an attempt to define the characteristics of the sub-sector quantitatively, will involve a review of published and possibly unpublished statistics, the extrapolation of data where little may exist, and the identification and interpretation of trends. This will probably be the most difficult of the list to complete. Task III, a description of the technical and environmental characteristics, is optional, but information on these themes should be picked up in the bibliographic compilation (Task V).

In any case, this will be a limited “research” exercise, based principally on the identification and review of secondary sources. Direct familiarity on the part of the researchers, with the characteristics of small-scale mining as it occurs in the countries being studied, should facilitate the work. If information is non-existent or very difficult to obtain, this should be explicitly noted. The research effort will assist in identifying critical information gaps. Researchers should keep in mind that their work will probably not be nor will it need to be definitive. It should be as complete as time and circumstances permit. Nevertheless, the results obtained may only be of an indicative or suggestive nature, requiring additional work beyond the scope of this effort, to lend real clarity to the issues. This is in fact what is expected - that the work will establish the points of departure for more in-depth studies and evaluations, or new initiatives, beyond the life of MMSD.

Research Tasks

I. Characterize the current legal status of artisanal and small-scale mining in the region

Legal definitions may or may not take the differences in types of small scale mining into account [see end note]. Most legal definitions, when they exist, distinguish between types of small-scale mining based on the technology applied to the exploitation (manual tools, machines), the depth of exploitation, or their projected daily or annual output. In a few cases, a special type has been defined (e.g. Venezuela), the “mancomunidad”, a collective or group of people united in a common activity, in this case small-scale mining. In some countries, the government may distinguish between small-scale mining of metals (including precious minerals), industrial minerals, and energy minerals (like coal and uranium), with different rules and regulations applying in each case.

- a) Document **official definitions** of artisanal and/or small-scale mining, if any, used by government for administrative or policy purposes as described in mining codes, special decrees or mineral policy statements (include references)
- b) inventory all **legal codes and regulations** (mining, environment, tax, marketing), or specific chapters or clauses therein, which pertain to artisanal and/or small scale mining practice and its regulation
- c) identify and reference any **official policy statements** or sections of policy statements that relate to artisanal and small-scale mining
- d) describe any **changes** to the legal or policy framework that have occurred during the past 10 years (e.g. promulgation of a new code specific to smallscale mining or new regulations)

Have the changes identified had any discernible impact on rationalizing or regulating existing and promoting new activity within the sub-sector ? Identify any promising new policy directions.

II. Characterize the actual status, role and importance of artisanal and small-scale mining in the region

- a) collect any **official statistics** on registered or **formal miners**, artisanal and small-scale, on mill, processing or fabricating operations that serve the needs of the small miners, on licensed buying and marketing agents; try to break these out on the basis of mineral or mineral group (industrial minerals, energy minerals, precious minerals (gold, silver, platinum, diamonds, colored stones), and metals)
- b) collect/compile any official and/or unofficial statistics **on mineral production or revenues** derived from artisanal and small-scale mining activities, by mineral, and according to whether production is registered or unregistered Terms of Reference for Regional/Country Studies on SSM, 5 April 2001 3
- c) compile any official or unofficial estimates of **participation in non-formal** or non-registered mining, processing and marketing activities, and break them out to whatever extent possible
- d) try to estimate the **numbers being supported** by the income generated from artisanal and small-scale mining activities
- e) try to estimate the relative importance (e.g. percentage breakdown) of the **different social-economic formations** [see end note] across the sub-sector, or for the most important mineral(s) or mineral group(s) being exploited, if possible
- f) identify and describe the various ways in which **production and processing activities** are organized and carried out (i.e. as individuals, as family groups, as informal partnerships, as formal civil associations or cooperatives, as informal or formal small companies (miners and mill operators as employees, or as partners), and try to determine their relative importance

across the subsector, or for the most important mineral(s) or mineral group(s) being exploited

- g) try to estimate **the net income** to the miners, generated by the different types of activities, within one or two selected minerals or mineral groups, if possible
- h) try to estimate the number and identify the **roles of women and children** involved in the various types of activities identified within the countries being studied
- i) try to estimate the indirect economic benefits or **multiplier effects** of the identified activities
- j) identify and try to quantify the **negative impacts on environment**, surrounding communities, and on **health**, that can be linked to small-scale mining activities in the country or region

Describe to the extent that you can, any trends or significant changes that have occurred over the past 10 years, with respect to the numbers of people involved, the relative importance of the socio-economic formations, the commodity focus, the involvements of women and children, the formalization of activity, the extent of local processing and its multiplier effects, the regional or country perspective on negative impacts (whether environmental, community or health related), etc.

III. Identify and describe the **range of practices in mining, processing and environmental control** currently in use across the sub-sector, and any significant changes that may have occurred during the past 10 years (optional)

IV. Inventory the following **support activities** for small-scale mining that have functioned or been initiated during the past 10 years

- a) **financing or credit schemes**
- b) **producer associations** (umbrella organizations, federations, mining chambers, regional or national associations) Terms of Reference for Regional/Country Studies on SSM, 5 April 2001 4
- c) formal **technical assistance projects**, training programs
 - government initiated or coordinated
 - ngo initiated or coordinated
 - private sector initiated or coordinated (private consulting group or mining company)
 - international development agency coordinated (e.g. UNDP, World Bank)

Describe any innovations in practice, program focus or implementing strategies or new initiatives that have occurred during the past 10 years. Try to assess the impact of these support activities on improving the practice, organization, and productive potential of the intended beneficiaries. Identify any promising new approaches.

V. Develop a preliminary **bibliography of published work** related to small-scale mining during the past 10 years, with special reference to the following theme areas

- a) legal codes and regulations, and legal reviews
- b) policy statements
- c) mining and processing practices
- d) environmental impacts, their management and control
- e) financing and marketing schemes
- f) technical assistance projects and programs

- g) organizational issues, including forms of work organization
- h) gender and child labor issues
- i) technology research
- j) environmental and community health
- k) occupational health and safety

VI. List and describe the interactions which have occurred during the past 10 years between **small-scale miners and medium and large exploration and mining companies** (state-owned, private foreign owned, or private domestic owned), both negative and positive.

Refer to such events as land expropriation and population displacement, invasion of concessions, collaborative activities, informal assistance, company policies viz. artisanal mining, etc.

VII. Record some examples (vignettes or short stories), which describe **positive change** or successful interventions in any of the various theme areas (e.g. the elimination of child labor from a small-mining operation, the successful adoption of the use of mercury retorts, the learning and application of environmental management practices, a woman owned and operated mining venture, the use of steel toed boots, a day care center at the mine, etc)

VIII. Compile a **list of resource people** and contacts with experience or current involvement in the support, evaluation, administration or control of small-scale mining activities in the countries being studied.

IX. Produce a **written summary**, which highlights the most important features of artisanal and small-scale mining in the country being studied, any significant progress made in legal reform, environmental management, and other sustainability issues, any success stories, and important weaknesses or deficiencies which remain to be addressed in order to strengthen or consolidate the sub-sector's ability to be a constructive factor in the development of sustainable rural livelihoods.

Note to Researchers:

An Excel template will be created within the next few weeks that will allow for the entry and compilation of data related to Tasks I, IV, V, VI and VIII.

End Note

Characterization of artisanal and small-scale mining activity in the regions

MMSD has chosen to try to understand the different social-economic formations of small-scale mining in terms of their livelihood functions and potential. Four types are defined:

- a) mining activity which is **full-time, year round** and is the **principal livelihood** of the household or individual
- b) mining activity which is **full-time, but seasonal**, complementing other subsistence or commercial activities, like farming, fishing, or animal husbandry, and is fully integrated into the household economic cycle

- c) mining activity which is **part-time, may be year round or occasional**, and provides a **supplement to household income** or meets a special need
- d) mining activity which tends to be **full-time, but short-term**, undertaken
 - i) in **response to economic or environmental stress** in the home area or,
 - ii) **to take advantage of a potential bonanza opportunity** (e.g. a gold rush).

Type (d) would typically end when other livelihood opportunities become available in the home area or the bonanza opportunity is played out.

These activities may be legally registered (or formal), or they may be “unauthorized”, informal. Those types which are formalized, potentially, but do not always, include Types (a), (b), and (d, ii).

Women and children may be involved in all of them, but the nature and extent of their involvement may vary dramatically, between types, and between cultures and regions.

All or some of these types may exist within a country or region. The small-scale production of a specific mineral commodity may be characterized by all of the types enumerated above, while the production of others may involve only one or some.

ANNEX IV: List of potentially relevant issues

ANNEX IV.A.: Potentially relevant issues for properly characterizing artisanal and small-scale mining activities and their developmental role(s) and impact(s) within communities and regions.

Characterizing artisanal and small-scale mining activities

- ASM definition
 - Type of ASM definition
 - Definition from international sources
 - National ASM definition
 - Case specific ASM definition
 - ASM undefined
 - Appropriateness of ASM definition
 - Definition describes reality
 - Definition distinguishes between artisanal mining and small-scale mining
 - Main focus of ASM definition
 - Technical (production, machinery, size of concession)
 - Social (organization, individuals, culture)
 - Economic (investment, production, revenues)
- Expressed visions of ASM
 - ASM as effect of poverty
 - ASM as opportunity to defeat poverty
 - ASM as livelihood strategy
 - ASM as traditional activity
 - ASM as boom-type activity
 - ASM as segment of the mining sector
 - ASM as “outlaw” activity
 - ASM as “phenomena” or problem
- Quantification of ASM
 - Production from ASM
 - Quality of data (exact or estimated)
 - Sources of data (public sector, private sector)
 - Break down of information (per segment, region, commodity²⁵)
 - Production quantity
 - Value of production
 - Number of operations/mines by category (surface, underground)
 - Degree of mechanization by adequate indicators (e.g. kW installed) in order to distinguish between
 - artisanal mines
 - semi-mechanized operations
 - mechanized operations
 - Population involved in ASM activities
 - Quality of data (exact or estimated)
 - Sources of data (public sector, private sector)
 - Break down of information (per age, gender, regions, mines)
 - Origin of population (local or migration)
 - Socio-economic-cultural stratification according to level of participation
 - ownership of mine, equipment, land, etc. (formal, informal)
 - mine worker (permanent, temporary)
 - Correlation with technical level of operation

²⁵ Attention to frequently forgotten “Generic ASM products” for local consumption like construction materials !

- artisanal mines
- semi-mechanized operations
- mechanized operations
- Organizational structure by types and numbers
 - Self-employment
 - Ad-hoc groups
 - Cooperatives
 - Collectively or community owned firms
 - Employer-employee schemes
 - Single-proprietorship firms
 - Corporations
 - Integration within Chambers or other umbrella organizations
 - Sources of data (public sector, private sector)
- Legal status
 - Number of licensed operations by type
 - Number of pending licenses
 - Estimated number of unlicensed mines/miners
 - Sources of data (public sector, private sector)

Characterizing developmental role(s) and impact(s)

- Development role(s) of ASM
 - Evaluated, recognized, or ignored
 - Income generation
 - National
 - Internal fiscal income
 - Taxes and Royalties from formal ASM
 - Indirect taxes from informal ASM²⁶
 - Foreign income generation
 - Formal exports
 - Informal exports (smuggling)
 - Proportion between national and imported products and supplies
 - Regional
 - Regional taxes and public revenues from ASM
 - Stimulation of regional economies
 - Creation of economic corridors
 - Infrastructure created or induced by ASM (physical, social)
 - Proportion of regional products consumed
 - Local (community level)
 - Local (municipal) taxes
 - Community participation in ASM
 - Royalties paid to local land-owners
 - Creation of local markets (food, supplies, services)
 - Infrastructure created or induced by ASM (physical, social, political)
 - Proportion of local products consumed
 - Individual
 - Average household income of miners
 - Employment opportunities
 - employment in the ASM sector
 - employment in service sector (transport, workshops, etc)
 - employment in commerce sector (merchants, shops, etc)
 - employment in vertically integrating activities (gem cutting, etc)
 - Personal capacity building
 - Informal training (learning by doing)
 - Educational and training facilities

²⁶ e.g. double ended VAT-chain

- Migration
 - Providing employment in rural areas
 - Promoting migration towards “boom towns”
- Governance
 - Creation of organizations representing civil society
 - Strengthening of local and regional political authorities (elective potential)
- Livelihood opportunities (see chapter 0)
- Impacts of ASM
 - Environmental impact
 - Further details see chapter 0
 - Social impact
 - Avoiding conflicts
 - Generating conflicts
 - Creating economic dependencies (“new slavery”)
 - Interfering with other activities
 - Interfering with traditional cultural values
 - Creating knowledge and abilities
 - ...

ANNEX IV.B.: Potentially relevant issues for understanding the effects on the sub-sector as well as the constraints and/or opportunities for change posed by particular macro policies and realities, such as exchange rates, fiscal and budgetary policies and regulations, land right and titling issues.

Exchange rates

- General issues
 - National exchange rate policy
 - Fixed, crawling band, flexible or hands-off exchange rate regime
 - Exchange rates pegs to other currencies
 - Access to foreign exchange
 - Existence of legal parallel FX rates
 - Existence of black market parallel FX rates
 - Possibility to legally possess foreign currency
 - Possibility to maintain bank accounts in foreign currency
- Effects, constraints and opportunities of non-market conform official exchange rates on production costs, revenues and incomes of miners
 - Production costs
 - Affecting accordingly to degree of mechanization
 - Cost of imported supplies and spare parts
 - Cost-comparison for formal and informal import (smuggling)
 - Revenue
 - Markets for products (internal, export)
 - Revenue-comparison for formal and informal export (smuggling)
 - Intermediary informal traders and trading networks
 - Income of miners
 - Effect on household income (International commodity prices converted to national currency at official FX rate)
 - Access to external markets for gemstones, gold, etc
 - Cost of imported consumer goods (radios, etc) compared to cost of food
 - Cost of indirectly (at official FX rate) subsidized imported goods (fuel, etc.) compared to possible income by sale of products via informal export

Fiscal and budgetary policies

- General issues
 - Taxes, fees and royalties
 - General tax regime
 - Specific tax regime(s) for the mining sector
 - Royalties
 - Mining promotion
 - Governmental role in mining (governmental entrepreneurship, facilitation of private investment, privatization, ...)
 - Market intervention (positive or negative) by Government
 - General investment climate
 - Incentives (e.g. depletion allowance)
 - Stability
 - Political stability
 - Legal stability
 - Fiscal stability
- Linkages between fiscal policies and ASM
 - Direct taxes, fees and royalties
 - Estimation of tax-paying ASM miners
 - Number of administrative steps required to become a tax-payer
 - Existence of simplified procedures for ASM producers
 - Income taxes
 - Requirements for bookkeeping, Practical possibilities for auditing
 - Transaction taxes
 - Controlling authorities, Transparency of transactions
 - Royalties
 - Base for calculation,
 - Sanctions in case of evasion
 - Benefits in case of voluntary compliance
 - Indirect taxes
 - Specific taxes on certain supplies (fuel, spare parts, ...)
 - Value added tax on supplies and products
 - Procedures for fiscal credit and its timeliness
 - Production designated for internal markets
 - Production for export (e.g. VAT on gold)
- ASM and budgetary issues
 - Relevance of ASM production for GDP
 - Relevance of ASM exports (formal and informal) for foreign balance
 - Relevance of ASM production for substitution of imports
- Public investment for ASM and ASM-investment promotion
 - Public investment in infrastructure
 - Governmental investment in infrastructure for improved production (electricity, ..)
 - Governmental investment in general infrastructure of ASM regions (health, communications, ...)
 - Investment promotion
 - Governmental investment in mining related information (geologic mapping, ...) and investigation related to ASM
 - Government granting access to geologic information to ASM producers
 - Creation of instruments for financing ASM projects (credit lines, ...)
 - Public funding of national technical assistance programs
 - Inclusion of ASM in poverty reduction programs

Market regulations

- Regulation of commodity prices
 - Official price regulation

- Benefiting ASM
- Benefiting Government
- Benefiting third parties
- Private price regulation
 - Trader's cartells
- Officially regulated purchasing arrangements
 - State owned buying agencies
 - Authorization requirements for trading and licensing of (intermediate) traders
 - Gold trading through banks
 - Import / Export restrictions or incentives for minerals

Land rights

- Ownership of land
 - Land not in use owned by Government
 - Private ownership of land
 - Collectively or Community owned (tribal) land
 - Coincidences and conflicts between traditional land rights (tribal territories) and modern legal framework for land rights (private property).
 - Legal procedures to acquire land rights
 - Possession and use
 - Commercial transactions
 - Expropriation regulations
 - Cost of acquisition / formalization: registrar, fees, taxes ...
- Rights of the land owner
 - Surface rights
 - Agriculture, wood, breeding, ...
 - Construction
 - Access rights (roads, ...)
 - Subsurface rights
 - Linkages between land rights and mining rights
 - Cultural contexts (sacred lands, ...)
- Water
 - Abundance or scarcity
 - Existence of specific legislation regulating use of water
 - Water rights vs. land rights
- Royalties
 - Formal or traditional right of landowners to royalties from mining operations
 - In cash or kind
 - As shares of operations

Mining rights and titling issues

- ASM legislation
 - ASM segment considered within general mining law
 - Specific legislation for ASM
 - "Spirit" of ASM regulation (restrictive, promotion, ...)
 - ASM not regulated
- Licensing requirements for ASM
 - Forms of licensing (concession, permit, agreement, ...)
 - Requirements and limitations for non-mechanized subsidence artisanal mining
 - Requirements for semi-mechanized ASM
 - Requirements for "full-scale" mechanized ASM
- Compliance with licensing requirements

- Practical barriers for compliance with requirements
- Incentives for compliance with requirements
 - zoning of reserved mining areas for artisanal mining
 - priority rights
- Government's ability to control compliance
- Political will to control compliance
- Enforcement policy for licensing
- Cost / benefit of licensing for ASM miners
- Cost / benefit of licensing for Government
- Consequences of formalization / licensing
 - For ASM
 - Complementary legislations
 - Taxation
 - Social (insurance, ...)
 - Environmental
 - For Governments
 - Administration requirements
 - Pressure from Middle- and Large-scale Mining
 - Conflicting personal interests
 - Adjacent economic sectors (traders, ...)
 - Eventual loss of economic benefits from informality of ASM

ANNEX IV.C.: Potentially relevant issues for describing the flows of resources across sectors and inter-sectoral economic linkages

Flows of resources across sectors

- Expenditures of miners on consumer goods and services
 - Consumer profile of average ASM families
 - Distribution of expenditures
 - Operating costs of the mine
 - Cost of living
 - Budget vital for basic needs (food, clothing, housing ...)
 - Budget for vital services (health, education, ...)
 - Budget for non-vital needs (electricity, communication, ...)
 - Budget for non-vital services (expenditures to acquire social prestige)
 - Origin of demanded goods and services (local, regional, national, imported, ...)
 - Economically linked stakeholders
 - Local suppliers (farmers, ...) and intermediaries (shops, ...)
 - Transport (trucks, buses, ...)
 - National industry and intermediaries
 - Importers
 - Estimation of employment leverage factor
- Expenditures of miners on capital goods
 - Investment in capital goods for mining
 - Investment in capital goods for other uses
 - Investment in adjacent sectors (trucks, ...)
 - Non-investment capital goods (for personal use)
 - Improvement of housing quality
 - Goods to increase living standard (tv, refrigerator, ...)
 - Acquisitions in order to increase social prestige
 - Origin of capital goods (national production, import, ...)
- Uses for eventual surpluses

- Saving (forms of saving)
 - Cash
 - Bank accounts
 - Investment in other economic sectors (agriculture, commerce, ...)
- Support of family members
 - Living within same community
 - Living in other communities
- Quantification of cross-sector effects
 - Importance of ASM as local consumer
 - Importance of ASM for maintaining of marginally economic activities (seasonal and part-time miners, ...)
 - Quantification of trading margins (commercialization chain from miner to export or end-user)
 - ASM contribution to foreign exchange balance
- Linkages with criminal activities
 - Drug traffic
 - Weapon traffic
 - Money laundering

Inter-sectoral economic linkages

- Upstream: with local providers of goods and services
 - Expenditures of miners for keeping the mine running (operating costs of the mine)
 - Miner's cultural concept of operating costs (cost category separated or mixed with cost of living, ...)
 - Cost of access to critical or regulated supplies (chemicals, explosives, ...)
 - Financing of operation capital (own money, lent money, credit from provider, ...)
 - Investment in capital goods for mining
 - Reinvestment in the mine
 - Culture of mine improvement
 - Investment in mechanization (compressors, mechanization, mine vehicles, ...)
 - Investment in non-material capital goods (safety, environment, geology, knowledge, information, ...)
 - Vertical integration to create aggregate value (mill, smelting, gem cutting, jewelers ...)
 -
- Downstream: with manufacturing based on domestic minerals, construction based on domestic minerals
 - Gold and gemstones
 - Traders, trading organizations, trading chains, ...
 - Determination of price (offer or demand driven market, regulated market, formal/informal market...)
 - Access for miners to laboratories or gemstone-valuation-experts
 - National industries or small-enterprises (Refining, Gem cutting, jewelry, ...) (local, regional, national)
 - Industrial minerals, construction materials
 - Access to local and regional markets
 - Vertical integration and aggregate value (brickmaking, pottery, polishing, ...)
 - Cultural value of ASM, influence on traditional architecture (available construction materials)
 - Coal, base metals, ...
 - Marketing channels, buying organizations
- Credits and other forms of financing
 - Capital requirement
 - Risk-capital requirement for prospection and exploration
 - (Risk-)capital requirements for mine development
 - Capital requirements for mechanizing
 - Sources for financing
 - Public
 - Private

ANNEX IV.D.: Potentially relevant issues for identifying additional opportunities for complementary or alternative livelihood development and for increasing the economic and commercial multiplier effects of this activity.

Analysis of livelihood assets and vulnerability

- Inventory of livelihood assets
 - Natural/Biological Capital: mineral, land, water, common-property resources, flora, fauna
 - Social Capital: community, family, social organizations, organizational networks
 - Economic/Financial Capital: employment, savings, credit, investments
 - Human Capital: education, labor, health, nutrition
 - Physical Capital: roads, markets, clinics, schools, bridges
- Analysis of vulnerabilities
 - Vulnerability of natural capital
 - Ownership resources (formality/informality, ...)
 - Environmental issues
 - Vulnerability of social capital
 - Family context of ASM
 - ASM-sectorial organization
 - Vulnerability of economic capital
 - Ownership of production facilities (equipment owner, ...)
 - Dependencies from private creditors and money lenders,
 - Arbitrariness of prices for products
 - Vulnerability of human capital
 - Occupational health risks
 - General health conditions in ASM communities
 - Health and educational situation for miner's children
 - Vulnerability of physical capital
 - Continuity of services, vulnerability due to seasonal changes (transport during rainy season, water supply during dry season...)
 - Proximity and access to basic services (health, schools, ...)
- Definition of Poverty Reduction Strategy as Livelihood Strategy
 - Increase of assets
 - Decrease of vulnerabilities
 - Sustainable benefits from assets

Complementary and/or alternative livelihood development

- Opportunities for livelihood strategies towards increasing assets
 - Increasing mining related assets
 - Natural Capital
 - Information on inventory of minerals, exploration status
 - inventory of possible by-products
 -
 - Social Capital
 - Co-operatives and associations
 - Culture of equipment sharing
 - Technical support on mineral extraction
 -
 - Economic Capital
 - Attract investment in ASM
 - Marketing information systems
 - Technical support on value-adding
 - Extension of credit facilities to ASM sector

-
- Human Capital
 - Information on mining technologies
 - Skills for producing by- products
 - Creation of business skills and business culture
 - Promotion of value added chains anchored around mining products
 - Leadership skills for management of co-operatives and associations
 -
- Physical Capital
 - Promotion of mechanization
 - Processing & laboratory infrastructure
 - Multi-purpose water supply
 -
- Increasing assets not related to mining
 - Seasonality of ASM activities
 - Existing and traditional complementary economic activities
 - Of men
 - Of women
 - Possibilities for complementary economic activities (self employment and thereby poverty reduction in the informal sector through establishment of skills development initiatives in rural areas)
 - Agriculture
 - Livestock
 - Wildlife, fishery
 - Tourism
 - Manufacture
 - Rural travel and transport
 - Electricity generation
 - Communications
 - Potential for non-traditional activities
 - Identification, recognition and appreciation of “subconscious” indigenous skills and competences
 - Possibilities for creation of clusters (vertical integration)
 - For non-material assets (education, health, ...) see chapter “cross-cutting themes” (health, education, environment, ...)
- Opportunities for livelihood strategies towards reducing vulnerabilities
 - Regarding vulnerabilities see chapter “livelihood opportunities”
 - Priorization of vulnerabilities (probability of shocks affecting different assets)
 - Existing livelihood strategies to recover from shocks
 - Manageable shocks (organizational issues, community conflicts, conflicts with related shareholders, ...)
 - Non-intentional shocks (things that usually just happen)
 - Intentional shocks (shocks induced intentionally by someone to gain advantages)
 - Non manageable shocks (Civil wars, natural disasters, ...)
 - Participatory quality of livelihood strategies to overcome shocks
 - Shocks managed by leaders (strengthening / weakening leadership)
 - Shocks induce organization (common interests to overcome situation)
 - Role of external stakeholders
 - Role of partnerships
 - Definition of key players
 - Paternalistic approach: external stakeholders
 - Participatory approach: role of miners/families
 - Need for advocacy
 - multi stakeholder processes
 - sustainable livelihood approach linking different levels
 - Focus on empowerment
 - solution of “the” conflict

- creation of responsive strategies to resolve conflicts
- sustainability of solution
- Holistic vision
 - Possible negative side-effects of solutions
 - Transmission of holistic vision to local stakeholders (seeing their problem in a wider context)
 - Opportunities for strategic alliances with other groups with similar vulnerabilities

Economic and commercial multiplier effects

- Economic linkages with other sectors (see Annex III.C)
- Economic linkages within sector (see Annex III.C)

ANNEX IV.E.: Potentially relevant issues for understanding the interplay of important cross-cutting themes like HIV/AIDS infection and transmission, environmental degradation and health, gender, child labor, resource conservation across generations, use rights and governance

HIV/AIDS infection and transmission

- General risk factors for AIDS transmission (predominant for country / region)
 - Cultural factors (monogamy, non-monogamy lifestyles, ...)
 - Incidence of infidelity
 - Social status of prostitution
 - Non-sexual transmission
- Incidence of HIV/AIDS in ASM regions compared to urban and rural countrywide average
 - ASM-sector specific issues increasing or decreasing risk of transmission
 - Type of ASM community/ies
 - Range between
 - Traditional community, gaining complementary income from ASM; to
 - Recent boom-town community induced by ASM
 - Predominant social structures in ASM communities
 - Family based
 - Temporary stable relations
 - Singles and migratory populatio
 - Cultural issues, believings
 - Educational level, availability of AIDS-information and reach of information campaigns in ASM regions
- Public health care, medical attention, diagnostics
 - Health care facilities, and their role in information and prevention
 - Statistical information available
 - Average age of infection
 - Gender distribution of infections
 - Life expectancy of infected
 - Orphanage due to infection of parents
 - Infected minors
 - Health education for infected and non-infected population
 - Access to HIV/AIDS information, counseling and testing services
- Role of mass-media (tv, radio, newspapers, ...) in education and prevention
 - Coverage of media in ASM regions
 - Profile of media able to reach ASM population
- Effects of HIV/AIDS infection
 - Possibilities for infected to obtain formal employment in other sectors

- ASM as “last resource” or “shelter”
- Linkages between AIDS-orphans and child labor

Environmental degradation

- Quantification of environmental impact on national level
 - Area in use by ASM (licensed or informal)
 - Area affected by ASM
 - Types of effects
 - Intensity of effects
 - Area rehabilitated
- Environmental requirements for ASM
 - Environmental requirements for mining in general (EIA, ...)
 - Differences between general regulations and regulations for ASM
 - Environmental regulations for ASM understandable for miners
 - Environmental regulations for ASM in concordance with scale of operations
 - Environmental requirements for ASM affordable for miners
 - “Spirit” of regulation
 - “theoretic” .. oriented towards producing data, documents and permits
 - “pragmatic” .. oriented towards achieving positive environmental impacts
- Environmental compliance and enforcement
 - Importance of environmental issues for miners
 - Availability of information about environmental issues to miners
 - Consciousness of miners about environmental issues
 - Priority of environmental issues within the scale of values of miners
 - Governmental compliance policy
 - Incentives for voluntary compliance (win-win options)
 - Civil society involved in enforcement (NGO’s, ...)
 - Public environmental enforcement (mine inspectors, ...)
 - Credibility of enforcing agency
 - Institutional strength of enforcing agency
 - Field-presence of enforcing agency
- Environmental impact on community or mines level
 - Priorization of environmental impacts
 - Environmental impacts affecting alternative livelihood development
 - Land degradation
 - Deforestation
 - Siltation
 - Environmental impacts affecting health of population
 - Emissions of chemical agents
 - Mercury
 - Cyanide
 - Heavy metals
 - Noise and dust
 - Malaria breeding in flooded open pits
- Environmental management plans
 - Public programs for abandoned environmental passives
 - Technical support/assistance for implementation of environmental measures
 - Availability of adequate environmental techniques for ASM
 - Practice oriented technical education for mining professionals
 - Mining schools for ASM
 - ASM in mining schools
 - Degree of externalization of environmental costs

Resource conservation across generations

- Present value of resources to be conserved
 - Unrealized future profits
 - Lost opportunities to increase livelihood assets
- Value of eventually lost un-conserved resources
 - Unrealizable future profits
 - Lost assets and lost opportunities
- Cost of resource conservation
 - Degree of externalization of conservation costs by interested stakeholders
 - Sustainability of resources vs. sustainability of livelihood assets
 - Inter-generational timeliness of conversion natural assets into human-, social,- economic- and physical assets

Health

- General health issues
 - Public health care in ASM regions
 - Doctors, hospitals, laboratories
 - Quality, quantity (Existence of basic laboratory and medical equipment)
 - Cost for patients
 - Involvement of families
 - Orientation of public health care
 - Curative
 - Preventive
 - Ability to deal with specific ASM challenges (link with occupational health)
 - Private health care in ASM regions
 - Doctors, pharmacies
 - Openness for preventive health care (economic aspects)
 - Traditional health care
 - Role
 - Importance
 - Prevention and control of malnutrition
 - Infant and young children feeding
 - Food and Nutrition programs for lactating and pregnant mothers
 - drinking water and sanitation situation
- Occupational health
 - Health hazards
 - Prevention programs, training facilities
 - Training of miners in mine safety
 - Training of miners in first aid
- Environmental health
 - Short term and long term health hazards (mercury, ...)
 - Analytical capacity to diagnose effects of contamination
 - Cost of environmental health diagnosis

Gender

- Traditional gender roles
 - Traditional roles of women
 - Households and children (Nutrition, Health, Education, ...)
 - Agriculture, livestock
 - ...
 - Financial autonomy of women
 - Marketing of agricultural products

- Commerce
- Women-specific conditions
 - Situation during pregnancy, lactancy, ...
 - Discrimination and inequity of opportunities
 - Sexual harassment and adolescent pregnancy
- Artisanal mining specific gender roles
 - Employment opportunities in ASM (formal, informal)
 - Roles within mining activities
 - Mineral extraction
 - Mineral processing
 - Employment opportunities in linked activities
 - Downstream and upstream activities
 - Providing supply to miners
 - Trading minerals and/or adding aggregate value (cutting)
 - Prostitution in mining camps
 - Financial autonomy of women in ASM mining regions
 - Increased dependence
 - Decreased dependence
- Education
 - Gender awareness teaching materials for equitable participation of both boys and girls
 - equitable participation of men and women in adult literacy classes

Child labor

- Predominance of child labor patterns
 - “Forced” child labor
 - contracting children as cheap workforce
 - giving away children due to economic limitations
 - Child labor within family context
 - ASM as family occupation (everybody takes part)
 - Perception of child labor as “educational skill training”
 - “Self-employed” child labor
 - Situation of orphans (esp. AIDS/HIV orphans)
 - “Out to survive” Maltreatment, malnutrition, ...
- Child labor as constraint for children’s personal development
 - Physiological issues, Health hazards of child labor
 - Educational issues
 - Loss of educational opportunities
 - Restrictions on literacy, numeracy and life skills
 - “Poverty trap”
- Legal situation of child labor
 - Governmental protection of children and adolescents
 - Public programs against child labor
 - Complementary nutrition programs
 - Advocacy for children’s rights
 - On paper, in practice
 - Stakeholders
- Related issue: Education
 - Quality and relevance of primary education
 - Appreciations by parents (Skills necessary for life, opportunity for escaping poverty, Waste of time, ...)
 - Cost of attending primary education
 - Availability of special education for out of school youth
 - Quality and relevance of secondary education
 - Appreciation by adolescents (Investment of time of adolescents against alternative: earn money, ...)

- Cost of secondary education (proximity/distance from ASM communities, extra expenses in district town, ...)
- Possibilities for adult secondary education
- Equity of chances by gender (re-admission of girls after pregnancy)

Governance

- **Institutional capacity for local governance based on democratic rights and responsibilities**
 - Political leadership
 - Local autonomy of budget, accounting and financial management system at regional level
 - Participative public expenditure planning and budget preparation
 - Predictability of public funding
- **Accountability of civil servants for results**
 - Prevention of corruption and fraud
 - Procurement procedures
 - Code of conduct for public officials
- **Depoliticisation of security and justice organisations**
 - Capacity and political will to deliver effective and efficient justice particularly for the poor
 - Civic education of the community
 - Ensuring appreciation and respect of law
 - Regarding rights and access to legal services
 - Regarding independence and neutrality of security and justice organizations
 - Empowerment and ability of the police and justice organisations to arrest and deal with "untouchables"
- **Crime incidence and crime control in ASM communities**
 - Police presence, particularly in rural and border areas
 - Police's response to calls for assistance
 - Proliferation and control of firearms
 - Rights of victims of crime, suspects and prisoners

ANNEX V: Benchmark indicators – Technical notes

Natural capital indicators

Arable land: includes land under temporary crops, temporary meadows for mowing or for pasture, land under market and kitchen gardens, and land temporary fallow.

Permanent cropland: is land cultivated crops that occupy the land for long periods and need not be replanted after each harvest, including land under flowering shrubs, fruit trees, nut trees, and vines, excluding land under trees grown for wood and timber.

Freshwater resources: refer to total renewable resources, including internal flows of rivers, and groundwater from rainfall in the country and river flows from other countries.

Forest area: is land under natural or planted stands of trees, whether productive or not.

Average annual deforestation: refers to the permanent conversion of natural forest area to other uses. Negative numbers indicate an increase forest area.

Higher plants: refer to native vascular plant species (only flowering plants).

Mammals: exclude whales and porpoises.

Birds: are listed for countries included within their breeding or wintering ranges.

Household: includes ASM and non-ASM households.

ASM household: refers to households which derive more than 50 % of their cash income from mining.

Human capital indicators

Physicians: are defined as graduates of any faculty or school of medicine who are working in the country in any medical field (practice, teaching, research).

Life expectancy at birth: is the number of years a newborn infant would live if patterns of mortality prevailing at the time of its birth were to stay the same throughout its life.

Under-five mortality rate: is the probability that a new-born baby will die before reaching age five, if subject to current age-specific mortality rates.

Prevalence of child malnutrition: is the percentage of children under five whose weight for age and height for age are less than minus 2 standard deviations from the median for the international reference population ages 0-59 months. The reference population is based on children from the United States, who are assumed to be well nourished.

Prevalence of HIV: refers to the number of people who are infected with HIV among the adult population.

Adult illiteracy rate: is the percentage of the people ages 15 and over who cannot, with understanding, read and write a short, simple statement about their everyday life.

Primary completion rate: is the total number of students successfully completing the last year of primary school in a given year divided by the total number of children of official graduation age in the population.

Average years of schooling: are the years of formal schooling received, on average, by adults age 15 and over.

Total population: includes all residents, regardless of legal status or citizenship, except for refugees not permanently settled in their country of asylum, who are generally considered part of the population of their country of origin.

Target area: is the geographical area under investigation to be defined by the researchers conducting the survey.

ASM population in target area: ASM includes all persons engaged in artisanal and small-scale mining and related peripheral production activities as defined by the researchers conducting the survey.

Share of migrants in ASM population: is the percentage of people active in ASM who are not indigenous and do not intend to permanently settle in the target community.

Females as percentage of labor force: show the extent to which women are active in the labor force.

Children 10-14 in labor force: refer to the share of that age group active in the labor force.

Children below 10 in labor force: refer to the share of that age group active in the labor force.

Financial capital indicators

Rural poverty rate: is the percentage of the rural population living below the national rural poverty line.

Urban poverty rate: is the percentage of the urban population living below the national urban poverty line.

Population on 1\$ a day and population on 2\$ a day: is the percentage of the population living on less than \$1.08 a day and \$2.15 a day at 1993 international prices. Poverty rates are comparable across countries.

Gross national income (GNI) per capita: GNI is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output plus net receipt of primary income (compensation of employees and property income) from abroad. GNI per capita is GNI divided by midyear population.

PPP gross national income per capita: is GNI converted to international dollars using purchasing power parity rates divided by midyear population.

Deposit interest rate: is the rate paid by commercial or similar banks for demand, time, or savings deposits.

Lending interest rate: is the rate charged by banks on loans to prime customers.

Average household cash income from paid work: refers to cash income earned by all members of the household from paid labor or from the sale of own production and services.

Average household non-cash income from food production: refers to the cash equivalent of agricultural products produced by household members for own consumption.

Total average income per person: is the total average household cash plus non-cash income divided by the number of persons per household.

Average household cash expenditures for food: includes money spent on the purchase of food and beverages.

Average household cash expenditures for non-food: includes money on the purchase of non-food products and services.

Total average household cash expenditures: includes household expenditures on food and non-food purchases.

Share of cash food budget in household income: is the percentage of household cash expenditures on food related to total household cash income.

Share of households owning savings in cash assets: is the percentage of households with savings in cash, bank deposits or securities.

Household savings rate: refers to the percentage of household income not spent on consumption and saved.

Social capital indicators

Public expenditures on pensions: includes all government expenditures on cash transfers to the elderly, the disabled, and survivors, and the administrative costs of these programs.

Average pension: is estimated by dividing total pension expenditure by the number of pensioners.

Public expenditure on health: consists of recurrent and capital spending from government (central and local) budgets and social (or compulsory) health insurance funds.

Violent offenses: refers to the number of violent crimes (murder, attempted murder, robbery, forcible rape, and aggravated assault) as defined in national legislation recorded by law enforcement authorities.

Property offenses: refers to the number of property-related crimes (burglary, larceny, motor vehicle theft, arson) as defined in national legislation recorded by law enforcement authorities.

Physical capital indicators

Hospital beds: includes inpatient beds available in public, private, general and specialized hospitals and rehabilitation centers.

Access to an improved water source: refers to the percentage of the population with reasonable access to an adequate amount of water from an improved source (household connection, public standpipe, borehole, protected well or spring, and rainwater collection). Reasonable access is defined as the availability of at least 20 liters a person a day from a source within one km of dwelling.

Access to improved sanitation facilities: refers to the percentage of population with at least adequate excreta disposal facilities (private or shared, but not public) that can effectively prevent human, animal, and insect contact with excreta. Improved facilities range from simple but protected pit latrines to flush toilets with sewerage connection.

Households with access to services: are the percentage of households in formal settlements with access potable water (drinking water within 200 meters of the dwelling) and connections to sewerage, electricity, and telephone.

Passenger cars: refer to road motor vehicles other than two-wheelers, intended for carriage of passengers and designed to seat not more than 9 people, including driver.

Two-wheelers: refers to mopeds and motor cycles.

Radios: refer to radio receivers in use for broadcasts to the general public.

Television sets: refer to those in use.

ASM operation level indicators

Mineral production: refers to the annual production of marketable mineral products by ASM operations measured in units of weight.

Production unit: refers to any formal or informal operation in which minerals are extracted and processed by one person or a related group of people typical for the target area.

Share of production units organized as: is the percentage of the number of mining operations organized in the form of ad-hoc groups, single proprietorship firms, co-operatives or registered partnerships.

Average duration of licensing process: is the time passed from submitting the application to the mining authority until the issuance of the licence.

Licensing costs: is the US\$ equivalent payable for a mining licence and related documentation.

Number of pending licence applications: is the total number of licence applications submitted to the mining authority for processing not settled.

Mine site inspections: refers to the number of visits by officials from the competent authority (mines inspectorate) responsible for the ASM district per year and production unit.

Number of conflicts: refers to the number of conflicts between ASM and large-scale mining companies and ASM and communities reported to law enforcement authorities per year.

Lost workdays/days due to illness: Lost workdays/days due to illness refers to the total number of days in the reference period in which a person is unable to perform his/her duties due to illness.

Protective equipment: refers to any equipment or device used by mine workers to protect them from injury and occupational diseases (safety hat, safety boots, goggles, protective gloves, protective respiratory device, hearing protection, first aid kit).

Lethal accident: all accidents at mine sites causing loss of life within a period of 30 days or as specified in national regulations.

Lost workdays due to mine accidents: include days away from work and days of restricted work activity resulting from occupational injuries to mine workers which occur at a mining operation and cause an inability to perform all work duties on any day after the injury.

Labor productivity: is the ratio of the average output of the marketable end product of ASM per person per day worked (e.g. grams of gold/day).

Mineral recovery: is the ratio of marketable end product recovered and available for sale to the quantity of mineral containing ore extracted and processed.

Share of miners with membership in ASM association: refers to the percentage miners who are members in a registered mining association.

Share of miners with membership in labor union: is the percentage of miners who are members in a registered labor union.

Share of production units with mining licence: is the percentage of ASM production units holding a valid prospecting or mining licence, or working on a property for which a mining licence has been granted to a title holder.

Share of production units with proven mineral reserves: is the percentage of ASM production units exploiting a mineral deposit for which reserves in terms of tonnage and grade have been established through detailed geological investigations.

Area affected by ASM: is the total land area in which artisanal and small-scale mining is currently active plus the land area of abandoned ASM mine sites not rehabilitated.

Annual land degradation: refers to the area of previously undisturbed land affected by ASM per year.

Annual land rehabilitation: includes the area of land affected by ASM restored in accordance with the reclamation requirements specified by the mining/environmental authorities.

Use of mercury in ASM: refers to mercury consumed in the amalgamation of gold ores.

Mine assets owned per production unit: refers to the estimated book value (initial investment less depreciation) of the purchased equipment in use.

Average income from mining: refers to the estimated amount of money earned in the mining activity less related expenses (for equipment, consumables and royalties).

Share of production units with bank loan: refers to the percentage of mining operations with a loan from a commercial bank or a registered financial institution.

ANNEX VI: Compilation of profiling tasks, checklist issues and benchmark indicators

A. Natural capital

- a) Review and describe the endowment of the study country and the target area with natural resources, using indicators from statistical yearbooks available at the national level, supplemented by comparable data collected at the community level, including
 - Land area and land use (arable land, permanent cropland)
 - Freshwater resources
 - Forests and Flora
 - Forest area
 - Average annual deforestation
 - Number of higher plant species
 - Fauna (number of species of mammals and birds)
- b) Collect information on ownership of land in ASM study area and neighbouring communities
 - Share of households owning land
 - Average size and type of land owned
- c) To characterize the role of the ASM sub-sector in the use of natural resources in the study area compile data and information on
 - past, current and projected future mineral production (based on official statistics or estimates verified by field observations)
 - an inventory of mineral resources and types of deposits extracted (including estimates of extension, tonnage and grade)
 - total number of production units (formal or informal operations in which minerals are extracted and processed by one person or a related group of people) active in study area
 - share of production units with proved mineral reserves
 - average number of workers per production unit
- d) Investigate and record structures and processes that affect access to natural assets for ASM, including
 - Definition of and special provisions for ASM in mining code, if any, as well as recent changes in legislation and policies aimed at regularizing the sub-sector
 - Requirements for legal access to mineral resources (mining title, land rights, water rights, indigenous rights, environmental impact assessment) and extent of regularization
 - Share of production units with mining licence
 - Number of pending licence applications
 - Estimated number of unlicensed miners
 - Authorities controlling and assisting the mining sector (mines inspectorates, geological survey, environmental authorities) and assessment of institutional performance
 - Average duration of licensing process (weeks)
 - Licensing costs (US\$/licence)
 - Number of mine site inspections in ASM study area per year
 - Key-stakeholders of the private sector related to mining (Mining companies, Chamber of Mines, NGOs)

- Conflicts on resource usage in ASM study area (with medium- and large-scale mines, with local communities)
 - Cultural rules, norms and practices determining the acceptance of ASM activities by local communities and consensual access to the deposits
- e) Describe and assess the environmental impact of the ASM activities in the study area
- Total area affected by ASM in study area (hectares)
 - Types of effects (deforestation, destruction of cropland, unprotected pits and trenches, waste piles, siltation of rivers, etc.)
 - Annual land degradation by ASM (hectares per year)
 - Annual land reclamation by ASM (hectares per year)
 - Use of mercury in ASM study area (kg per year)

B. Human capital

- a) Compile statistical information on the population and labor force of the study country and at the community level in the target area, including
- Total population of country (by gender and age)
 - Total population of target area (by gender and age)
 - Ethnical and religious groups with significant cultural differences in target area
 - ASM population of target area (by origin, gender, age and skills)
 - Share of migrants in ASM population
 - Gender and children participation in labor force in study country and in ASM
 - Females as percentage of labor force (%)
 - Children 10-14 in labor force (%)
 - Children below 10 in labor force (%)
- b) Collect data and information on the health of the population at the national and community level, including key health indicators
- Health care facilities in ASM or nearby communities (number, size, accessibility)
 - Number of physicians per 1,000 people
 - Life expectancy at birth (years)
 - Under-five mortality rate (per 1,000)
 - Prevalence of child malnutrition (% of children under 5)
 - Prevalence of HIV (% of adult males and females)
- c) Provide additional information on the specific health situation in ASM operations
- Specific occupational health risks in ASM operations
 - Lost workdays of miners due to illness (days per miner per year)
 - Lost days of other ASM household members due to own or child illness (days per person per year)
- d) Assess mine safety at ASM sites by compiling data on the following indicators
- Number of lethal accidents (per year per ASM district)
 - Number of lost workdays due to mine accidents (days per person per year)
 - Availability of first aid outfit and protective equipment (US\$ book value per production unit)
- e) Determine operational efficiency at ASM operations using the following indicators
- Average labor productivity (units product per person per day worked)
 - Average mineral recovery (%)

- f) Review education facilities and outcomes at the national and community level, based on the following indicators
- Schools and vocational training facilities in ASM or nearby communities (number, type)
 - Adult illiteracy rate (% ages 15 and over, male and female)
 - Primary completion rate (% of all children who complete primary school, male and female)
 - Average years of schooling (male and female)

C. Financial capital

- a) Provide statistical data and information to characterize the extent of poverty, economic performance and the macroeconomic framework at the national level, including
- Rural and urban poverty rate (%)
 - Population below 1\$ and 2\$ a day (%)
 - Gross national income per capita and PPP gross national income per capita (US\$)
 - Taxation policies (% highest marginal tax rate, individual and corporate)
 - Exchange rate policies (official exchange rate vs. estimated “parallel” exchange rate in local currency units to US\$)
 - Interest rates (% p.a., deposit rate and lending rate)
- b) Make an assessment of the contribution of ASM to financial assets at the country and community level
- Estimated contribution of ASM sub-sector to GDP and foreign exchange earnings
 - Effects of upstream linkages of ASM activities: income and employment effects at first and second level suppliers created by ASM demand for mining machinery and equipment, as well as consumables used in mining operations and ASM households
 - Effects of downstream linkages: income and employment created in consuming industries of minerals extracted by ASM (e.g. producers of mineral-based materials, construction, durable goods manufacturers, jewellers, etc.)
- c) Try to determine or estimate income, expenditures and financial assets at the community level, including
- Household income
 - Average household cash income from paid work (US\$/month or year)
 - Average household non-cash income from food production (US\$/month or year)
 - Number of persons per household and total average income per person
 - Average ratio of cash-income female/male
 - Household expenditures
 - Average household cash expenditures (for food and non-food, US\$ per month or year)
 - Total average household cash expenditures (US\$/month or year)
 - Share of cash food budget in household income (%)
 - Household savings
 - Share of households owning savings in cash assets (%)
 - Household savings rate (% of income)
- d) Try to determine or estimate financial assets at the ASM operation level, including
- Average income of persons in ASM from mining (US\$/month or year at different levels, i.e. mine worker, gang leader/shift boss, licence holder, property owner)
 - Access to official or informal credit

- Availability of official credit lines for ASM operations and share of production units with bank loans
- Share of production units with informal credit lines through mineral buyers or local money lenders
- Any other relevant observations on factors affecting financial assets in ASM, e.g.
 - Specific fiscal policies and market regulations affecting the mining industry
 - Formal and informal marketing arrangements, causes for illegal marketing (underpricing by official buying agencies, distorted exchange rates, tax evasion, operating capital financing by illegal traders)
 - Other linkages with criminal activities (drug trafficking, money laundering)
 - Use of savings (consumption, re-investment in exploration or mine assets)

D. Social capital

- a) Provide statistical data and descriptive information on social assets at the country level, including
 - Overview of political context, governance, security, justice, human and democratic rights, description of institutional landscape and climate of relationship between public and private sector
 - Description of existing social security system, including the following indicators
 - Public expenditures on pensions (% of GDP)
 - Average pension (% of per capita income)
 - Public expenditures on health (% of GDP)
- b) collect additional information to assess the social structures and capital at the country and community level, including indicators of public safety
 - Description of traditional hierarchical structures at regional and community level (role of traditional leaders and village councils)
 - Participation in formal social safety net
 - People with health insurance (%)
 - People entitled to unemployment benefits (%)
 - People entitled to receive pensions (%)
 - Average pension (% of per capita income)
 - Participation in social networks: share of people with links to
 - occupation-based associations (%)
 - community-based social assistance groups (%)
 - informal savings and credit groups (%)
 - informal safety nets based on “social contracts” within cultural norms
 - Public safety
 - Violent offenses (number per year per 100,000 population)
 - Property-related offenses (number per year per 100,000 population)
- c) Review social capital at the ASM operation level and collect specific indicators
 - Existing formal and informal ASM umbrella organizations/associations
 - Number and type of associations
 - Share of miners with membership in ASM association (%)
 - Effectiveness of ASM association
 - Share of miners with membership in labor union (%)
 - Organizational structures of ASM at operation level (share)
 - Ad-hoc groups (%)

- Single-proprietorship firms (%)
- Co-operatives (%)
- Partnerships (%)
- Public opinion about ASM
- Migration issues (positive and negative effects)
- Incidence of conflicts (number and type of conflicts with large-scale mines, communities, other ASM)
- Role of legislation, and private and public institutions in promoting ASM

E. Physical capital

a) Provide a general description of the public infrastructure (roads, railroads, clinics, schools) supported by specific indicators on physical assets at the country level, including

- Population access to services
 - Hospital beds (per 1,000 people)
 - Access to improved water source (% of population)
 - Access to improved sanitation facilities (% of population)
- Households with access to services
 - Access to potable water (%)
 - Sewerage connection (%)
 - Electricity (%)
 - Telephone (%)
- Transport and information assets (per 1,000 people)
 - Passenger cars
 - Two-wheelers
 - Radios
 - Television

b) Collect and present additional information on public infrastructure and on the ownership of physical capital at the ASM community level, including

- Availability of public infrastructure (roads, schools, clinics, telecommunication, drinking water, waste management) in the community
 - Quality of and distance to infrastructure
 - Authorities in charge of basic infrastructure (national, district, local level)
 - Culture of self-construction and maintenance of local public infrastructure by local population
- Share of households owning home (%)
 - Average size of home (m²)
 - With piped water in house (%)
 - With sewerage connection (%)
 - With electricity (%)
 - With telephone (%)
- Share of households owning
 - Passenger cars (%)
 - Two-wheelers (%)
 - Motor boat (%)
- Share of households owning
 - Radio (%)

- Television (%)
 - Refrigerator (%)
- c) Carry out detailed review of current mining and processing methods and physical assets employed at the ASM operation level
- Describe mining methods, practices and equipment used
 - Describe processing methods, practices and equipment used
 - Describe peripheral and support activities and equipment used
 - Identify principal problems, constraints and limitations encountered in ASM operations, particularly with regard to labor productivity and mineral recovery, including continuity/discontinuity of operations (seasonality)
 - Estimate mine assets owned per production unit and minimum investment requirements for a typical production unit to improve productivity and mineral recovery
 - Mining equipment (US\$ per production unit)
 - Processing equipment (US\$ per production unit)
 - Transport equipment (USD\$ per production unit)
 - Attitudes toward and benefits of technological changes and innovations (effects and benefits for different groups)
 - Existence of investment promotion programs (instruments for financing ASM equipment needs)

ANNEX VII. : Sample Questionnaire (VILLAGE SURVEY)

Name village:

Village ID:

Name of surveyor :

Date/time:

Name of interviewee(s):

Observations:

The column 'Method' lists suggested methods to obtain the data, using the following codes: V = Village tour, K = Key informant, I = Data from an institution, F = Focus group, H = Household survey, M = Measurement or observation by the researcher . Two letters not separated by a comma indicate a combination of methods, two letters separated by a comma are suggested alternatives.

A. General

		Nr.	Qualification/Description	Method
1	Inhabitants			VK
2	Small-scale miners			VK
3	Structures – all (including shops etc)			VK
4	Houses – inhabited			VK

B. Natural Capital

		Nr.	Qualification/Description	Method
1	Share of households owning land			VK, K, H
2	Average size of land holdings (ha/household)			F, H
3	Share of households owning livestock			VK, K, H
4	Average number of livestock by type			F, H
5	Distance of village to nearest mining area			K
6	Mineral resources exploited by ASM			K
7	Types of deposits exploited by ASM			K
8	Proportion of households with at least one member working in mining			H, F
9	Resource uses other than mining			K
10	Access to clean drinking water (Y/N)			K
11	Resource conflicts over the past year, including location and cause			K
12	Resource conflicts over the past five years, including location and cause.			K
13	Sacred lands (# ha and distance)			KM
14	Number of individuals in the community owning mines			K

Brief description of rules for resource allocation (mining titles, land rights, etc.):

C. Social Capital:

		Nr.	Qualification/Description	Method
1	Community organizations, incl. churches			VK, M, K
2	Membership of community organizations (% of population)			I, K, F
3	Membership of occupation-based mutual help groups (% of population)			I, K, F
4	Membership of miners' cooperatives or organizations (% of miners)			I, K, F
5	Percentage of households receiving assistance from formal safety nets (child benefits, pensions, unemployment benefits)			I, K, F
6	Percentage of households having health insurance			I, K, F
7	Percentage of ASM households having health insurance			I, K, F
8	Percentage of households enrolled in informal savings and credit groups			I, K, F
9	Percentage of ASM households enrolled in informal savings and credit groups			I, K, F
10	Type of government (elected, hereditary)			K
11	Government representatives			K
12	Native/indigenous authorities			K
13	Decision making culture (consensus, democratic, authoritative)			K
14	Number and percentage of women in ASM (% of labor force and % of population of women)			K, M, F
15	Number and percentage of children under the age of 10 in ASM labor force (% of age group)			K, M, F
16	Number and percentage of children of ages 10-15 in ASM labor force (% of age group)			K, M, F

Brief description of social organization:

D. Financial Capital

		Nr.	Qualification/Description	Method
1	Typical and range of incomes for different types of laborers in ASM (crushers, diggers)			F, K
2	Typical and range of incomes for bosses/equipment owners In ASM			F, K
3	Average net income of miner from mining (US\$/month)			H, K, F
4	Average net income from mining per household (US\$/month)			H, K, F
5	Estimated average household cash income from non-mining (US\$/month)			H, K, F
6	Estimated total average household cash income (US\$/month)			H, K, F
7	Estimated per household value of home food production (US\$/month)			H, K, F
8	Average number of persons per household			H, I
9	Total average income/person (US\$/month)			H, K, F
10	Average household cash expenditures for food			H, K, F
11	Average household cash expenditures for non-food			H, K, F
12	Average household expenditures for education (parent fees, books, school uniforms)			H, K, F
13	Total average household cash expenditures			H, K, F
14	Share of ASM households with a bank account			K, F, H
15	Share of ASM households with savings in cash, jewelry, livestock, or other relevant assets (number by type)			K, F, H
16 7	Percentage of households directly and indirectly earning income from ASM			H, K, F
17 8	Number of mining-related businesses (shops, gasoline vending stations)			K

Brief description of commercial activities surrounding ASM; who buys and sells, local prices, access to pricing information:

E. Human Capital

		Nr .	Qualification/Description	Method
1	Distance to nearest school (km)			K, M
2	Travel time to nearest school (hours:minutes)			K, M
3	Access to (vocational) training			K
4	School children			I
5	School teachers			I, K
6	Net primary enrolment ratio			I
7	Percentage of cohort reaching grade 5 (M/F)			I
8	Adult literacy (M/F)			H, K, I
9	Travel time to nearest clinic (hours:minutes)			K, M
10	Distance to nearest clinic (km)			K, M
11	Health care providers (physicians/nurses)			I
12	Native healers			K
13	Native/indigenous religious shrine			K
14	People having died of AIDS over the past five years			I
15	People being infected with HIV			I
16	Average per person number of lost working days due to ASM-related illnesses and injuries			I
17	Child mortality (number of deceased children under 5 years of age per 1000)			I
18	Share of households eating at least two meals a day.			H, K, F

Brief description of population (ethnic affiliation, typical features):

F. Physical Capital

		Nr .	Qualification/Description	Method
1	Share of households owning home			H, VK, F
2	Share of ASM households owning home			H, VK, F
3	Average size of home in m ² (ASM/non-ASM)			M
4	Share of houses built of modern construction material (e.g. tin roof instead of leaves; stone walls instead of mud/dung)			M
5	Share of households owning a relevant mode of transport (e.g. bicycle, motorbike)			H, VK, K
6	Share of households owning consumer durables (choose 2-3 most salient ones)			H, VK, K
7	Road access for motorized vehicles (Y/N)			K, M
8	Bar/Restaurant (number)			K, M
9	Stores (number)			K, M
10	Share of households with access to public electricity net (%)			K, F
11	Days of electricity/month			K
12	Community access to telephone network (Y/N)			K
13	Percentage of households with telephone			K
14	Community access to postal services			K
15	Type of waste management/sewage system			K
16	Number of individuals in the community owning mining equipment (by type)			K
17	Expenses of mechanized mining equipment –minimal and typical			K
18	Expenses of manual mining equipment –minimal and typical			K

Brief description of access to, and quality of, public services and infrastructure:

G. Prices

Confirm all prices with at least three people/stores in the community

1. Staple food source (e.g. corn meal, ~~+~~ cassava, plantain)
2. Tinned fish or meat (1 6-oz. tin)
3. Soft drink (1 can or small bottle; ~~20~~50 ml)
4. Bar of laundry soap (1 bar)
5. Gasoline (1 barrel)
6. Typical adult male daily wage in artisanal and small-scale mining (e.g. day laborer in the shaft)
7. Adult male daily wage within the community (e.g. for cutting an agricultural field)
9. Typical adult female daily wage in artisanal and small-scale mining (e.g. washing gold)
10. Adult female daily wage within the community (e.g. planting)

ANNEX VIII.: GLOSSARY

Concept	Definition/description
Data validity:	Validity refers to the accurateness and trustworthiness of the data
Data reliability:	Reliability refers to whether one gets the same answer by using an instrument to measure something more than once.
Indicator:	A relatively simple (often but not necessarily quantitative) measure to characterize a more complex concept or situation, which allows for comparison across time and space. For example, indicators of poor child health can be low weight or a swollen belly.
Key informant:	A person selected for his or her special knowledge about the topic of interest to the researcher.
Livelihood:	A livelihood comprises the capabilities -including both material and social resources- and activities required for a means of living.
Participatory methods:	An approach of collecting information that involves the community in developing questions and evaluating questions.
Secondary data:	Information and statistics that has been collected and recorded by others, usually in a summarizing fashion.
Stakeholder:	Stakeholders are people who are directly or indirectly affected by, or have the power to affect, an event or situation.
Sustainable livelihoods:	A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base.
Variable:	Something that can take more than one value; values can be <i>words</i> or <i>numbers</i> . Variables can be nominal (e.g. religion), ordinal (e.g. socioeconomic class; low, medium, or high), interval (e.g. temperature), or ratio variables (e.g. age)