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## DISCUSSION PAPERS

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The Potential of Small Industries in Sudan.
Case Study of Nyala

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## 1. Introduction

This is a report on a 12 month research project carried out in cooperation with the Ministry of Labour, Khartoum, from October 1987 - October 1988. This report presents some of the results of the field work for discussion, by far not all - a comprehensive analysis of the data has yet to be done.

The second part discusses briefly the theoretical background of the project. The third part describes the methods employed and discusses methodological problems. The fourth part describes the small industries in Sudan: their definitions, size and role, the impact of government policies on small industries, and available channels of finance. The fifth and largest part presents results of the survey on the small industries in Nyala. The annex contains some statistics on small industries in Sudan and in Nyala.

## 2.Theoretical Background

Since the end of the 1970s the Sudan faces a deep economic crisis. Traditional methods of stabilization policy have been employed since 1978 but unfortunately they failed to reverse the downward trends (for further discussion see Wohlmuth/Hansohm 1984, 1987). This appears to indicate the need for more fundamental structural adjustment measures. Since some time a consensus seems to have emerged between policy makers as well as researchers that the promotion of small scale industries is one of the necessary structural measures.This is also mentioned in the most recent Government programme concerning economic development (Republic of Sudan,1988, p.63).

Generally speaking, the sector of small industries and crafts seems to have a number of advantages in regard to economic and social development:

a) It caters for local, especially low-income markets and is suited to the need of the indigenous population.
b) Its activities are more labour-intensive and thus create more wide-spread income than large-scale industry.
c) It does not only need little capital, but also the kind of capital used is not of the scarce type. Much is produced by the small industrialists themselves (including the "human capital") or second hand equipment.
d) It diffuses skills. The indirect effects of diffusing and upgrading technical skills, e.g. metalworking, may be even more important than the direct benefits.
e) Its activities are more geographically dispersed than large industrial enterprises.
f) They are more accessible to indigenous entrepreneurs.
g) The sector is able to innovate and to exploit discarded materials.
h) It uses largely local inputs.
i) It can be a source of indigenous capital goods.
j) It can be a basis for a shift towards a more labour-using form of industrialization.
k) It can help to smooth down the rural exodus.
l) It has strong linkages to the agricultural sector (supply of agricultural inputs and consumer goods for the agricultural population, processing of agricultural products).

All these points are highly relevant for a strategy of structural adjustment which aims to attain a viable balance of payments position and growth.

However, in Sudan the data which are necessary to confirm these characteristics as well as to identify the sector`s potentials, their constraints, and appropriate measures of promotion, are largely missing. Most of the enterprises are not recorded in the statistics and macro-studies and the existing micro-studies on the sector do not provide sufficient data to answer the relevant questions.

In order to know about the sector`s potentials and to decide about appropriate measures of promotion, the decisive questions are: To which extent do the alleged developmental advantages exist in the reality of the different subsectors? What is the nature of the constraints to an evolutionary growth of the small industry subsectors? A discussion of the relevant literature on the small industry sector (see Hansohm/Wohlmuth 1987) shows that according to the answer to the above question there are very different approaches.

"Evolutionary growth" characterizes an absorption of a larger labour force at higher income levels in contrast to an involutionary growth which implies that a larger labour force is absorbed at a stagnant or declining level of real income. Opposite views are held on the questions whether internal or external constraints are crucial and whether these constraints can be overcome or will lead to a decline of the sector.

An internal constraint is "lack of entrepreneurship".Its roots are believed to be traditional sociocultural factors. The second kind of internal constraints is "lack of managerial capabilities". Here three kinds of abilities can be distinguished: a) motivation, drive, adaptability, b)organisational skills and c)technical skills.As many small industry enterprises are assumed to be family businesses, the economic relation between family and business has to be understood.

The studies emphasizing the external constraints can be divided into two groups: Those who hold that small producers are exploited by the large firms and those who maintain that their growth is prevented by difficulties in access to raw materials, product markets, technology and credit; these difficulties are seen to be reinforced by government policies.

The first approach maintains that the informal sector subsidizes the

formal sector by providing goods and services at very low prices and in this way depresses the wage level and renders possible the latter's high profits. A more direct relation between small producers and large firms is the subcontracting system. There is a controversial discussion between a dualist approach which regards this relation as benign and a petty commodity approach regarding it as exploitative.

The second chain of arguments emphasizes that the expansion of small enterprises is blocked by the pre-existence of very advanced technologies and by insufficient access to raw materials, product markets and credit. This line of reasoning is exemplified by the "marginalization" approach. Critics of this approach argue that the decline of traditional crafts and industries is not due to technological factors, but rather to government policy representing specific class interests.

A related issue is technical efficiency. Its actual role in displacing small producers is questioned by those who argue that the transfer of tastes and desires is a more important element. Concerning the product markets, important issues are the income levels of the different groups of population, the income elasticities of demand and the question, how strong the linkages of the small industry sector to agriculture (forward and backward production linkages, consumption linkages) are. The last set of factors is conditioned by the government policy concerning agriculture. Other potential markets are government and export demand.

Related to the credit issue are the rates of profit and the savings and reinvestment propensities of the sector.

All of the possible external constraints involve some impact of government policy. To evaluate their impact, not only the direct measures of small industry promotion, but also other fields as agricultural, industrial, monetary, wage, foreign exchange, fiscal and tariff policies have to be analysed. These policies themselves can only be understood as a reflection of certain interests of social groups on the domestic and international level.

3. Methodology

The relevant questions of research were identified by a review of literature on "small-scale industry", "rural small-scale industry", the "informal sector", and "rural non-farm activities" in developing countries (summarized in Chapter 2, discussed in more detail in Hansohm/Wohlmuth 1987).The conclusion was, that in order to understand the potentials and constraints of small industries not only different aspects of the internal economy of small industries (an analysis on the micro level) have to be understood, but also their economic framework (supply and demand markets) as well as government policies affecting the sector directly (legislation, institutions and measures of promotion) and indirectly (different fields of economic and non-economic policy) have to be put into perspective.

The basis for the analysis of economic policy in general and industrial policy in particular are recent World Bank reports and own reports. Their informations were updated by interviews with representatives of the relevant institutions.

A picture of small industries on the national level is obtained from the 1986 Technical Report on the Industrial Survey 1981/82 and the Handicraft Industries Survey 1970/71. The institutions which represent small industries (Sudanese Craftsmen and Small Enterprises Union, Sudanese Industry Association), which promote small industries (Industrial Bank of Sudan, Management Development Centre, Sudan Rural Development Corporation), which are relevant in legislation and planning (ministries of finance, industry and labour), as well as those which are involved in research were visited, All were provided with a recent paper on the subject (Hansohm forthcoming), which served as a basis for the discussions.

The core of the research is the micro-level analysis of small industry and craft industries. Because of the deficiency of research on secondary activities in Sudan`s peripheral areas and the special need of exactly these areas to develop secondary employment it was decided to select Darfur Region as the area of research. Before the work started, in discussions with the regional government it had been decided to concentrate the work on Nyala. This was to be complemented by a study on Buram town and some small markets in Buram Rural Council.

Neither the industry statistics, nor the lists of licenses issued in

Nyala, El Fasher and Khartoum give a representative view of the sizes and distributions of the different industries in Nyala. Firstly, the so-called informal activities are not covered. Secondly, a big part of licensed enterprises do not, or not yet, operate. Because of the absence of any previous study or statistics of number and distribution of industries in the area it was necessary to establish a sampling frame before enterprises/individuals could be selected for intensive study.

In order to establish the sampling frame in Nyala, the two industrial areas and the major markets were visited. Besides the two industrial areas (Heavy Industrial Area, Light Industrial Area), on 8 markets people practicing secondary activities were discovered: Suq al Kabir, Suq Umm Dafaso, Suq al Shabi, Suq al Mawashi, Suq Congo, Suq Texas, Suq al Geneina, and Suq Corea. All working enterprises and individuals were counted and the following information was collected: sex of entrepreneur, kind of activities, kind of workshop, nature of accomodation, number of workers (skilled /unskilled, male/female), number of family-related workers, possession of license, type of ownership/management, age of enterprise, possession of electric machines. Furthermore, on these markets the trade establishments were counted (classified by kind of accomodation) in order to get an idea about the importance of productive vs. trade activities.

This survey doesn't, however, cover 100 % of the crafts and industries. Firstly, some of the activities are carried out partly (e.g. carpentry) or completely (e.g. bricks) out of the market areas or at home (e.g. pottery, palm leaves products). In these cases, some enterprises/individuals were selected by random and visited; The total number of production units has to be estimated. Secondly, most of the activities are not carried out continuously, mostly either for lack of raw materials or because people work exclusively on order for lack of capital. For this reason, at any point of time, a survey will miss some producers. However, with a combination of different methods, reasonable estimates of the total number of producers can be made.

The basic information collected on all of the small industry enterprises/individuals provides the sampling frame for a selection of a number of enterprises/individuals representing different industries and, within the industries, representing their different sub-groups according to the characteristics mentioned above.

For the detailed analysis a questionnaire was drafted, translated, tested and reformulated (see App.2). Also, a short form of the questionnaire was developed to be applied in situations where the application of the long questionnaire proved to be difficult (especially on open places in the markets). However, these questionnaires were not applied as a strict questionnaire in the statistical sense. The supposition that primarily quantitative methods are not appropriate to discover and explain the reality of small industries in Darfur was confirmed during the research. Several reasons are responsible for this.

First, while not only theoretical, but also some practical work in the field (Hansohm 1986) had allowed to develop a concrete idea about the subject, nevertheless during all the phases of research new knowledge resulted in new perceptions and new questions. More and more misunderstandings were discovered and corrected. The reasons for these were not only linguistic or cultural, but also rooted in certain perceptions of and expectations concerning the researcher as well as the government (being represented by him) both from the side of the interviewees as well as the interviewers. This meant that a high degree of permanent awareness, openness and flexibility was essential; furthermore, the processes of testing, reformulating and proper interviewing could not be properly separated. On the contrary, they were parts of one process. In this situation to stick to standard methods of statistics would mean not only to forego information, but to arrive at wrong conclusions (an analysis of previous studies on small industries gives evidence for this).

Second, generally speaking the notion of "scientific research" is not well known. This is true not only for the industrialists, but also for the government service. For those who had any experience with being interviewed, it had mostly been a negative experience. They felt exploited by people who did not care for their interest. For this reason it was necessary not only to introduce the idea thoroughly, but also to convince the interviewees of one's genuine interest and to be open to the present individual situation of the interviewee - which is hardly possible with a standard questionnaire.

Representativeness was not achieved by random selection of interviewees but these were selected because of certain characteristics representing certain sub-groups.

Some informations given were considered as doubtful and were

confirmed or refuted by repeated visits and/or by interviews with others. For other informations several visits, in different seasons, were necessary, because they were subject to wide fluctuations (e.g. informations on working time, amount of production, prices, income). In short, the selected enterprises and individuals were taken as case studies.

During the rainy season the total survey of Nyala was repeated in order to confirm the informations on the seasonality of different kinds of work.

Originally, it was planned to compare Nyala with the smaller town of Buram and some villages in Buram Rural Council. In March Buram and two small markets in Buram Rural Council were visited for two weeks. It had been planned to revisit the area during the rainy season but this proved to be impossible for lack of transport. Later it was decided to discontinue the study on Buram area, the reason being the difficulties arising from the necessity of a case study approach (implying repeated visits) and the problem of transport.

## 4. Small Industries in Sudan

This chapter summarizes the evidence on the size and role of small industries in Sudan (4.1.) and discusses the role of past government policies on the sector (4.2.).

### 4.1. Size and Role of Small Industries

The statistical records concerning small industries in Sudan are very deficient. The statistics include only a fraction of these enterprises, especially of those in rural areas - let alone part-time non-farm activities. This is partly due to the fact that informal enterprises, which constitute a large part of small industries, are not registered by definition. Since the formal small industries are concentrated in the Three Towns, the statistics are biased towards that region.

The limited coverage of rural industries by the statistics can be recognized by a look at the regional distribution of the enterprises in the Industrial Survey 1981/82. It registers 1922 units (enterprises with less than 25 employees, excluding those engaged in bakery and grain milling). 45.7% of them are in Khartoum, 27.5% in the Central Region, 7.9% in Kordofan, 3.3% in Darfur. 9.6% in the Eastern, 5.7% in the Northern and 0.2% in the Southern Region (Sen 1985, 31). The neglect of small industries is most articulated in the Southern Region, but it is also true for other regions.

As far as small industries are registered, they play a major and positive role in the secondary sector. They account for 94.9% of all industrial establishments, 27.2% of employment, 34.2% of gross output and 49.4% of value added (see Statistical Appendix, Table 1). Compared to large industries, small industries produce 10 times more per unit of investment, need half of the investment to create a job, and their value added per worker is about 3 times more (Sen 1985, 28). Large industries appear to be heavily capital-oriented and grossly unproductive.

Small industries are heavily concentrated on food, beverages and tobacco production with 79.9%, followed by fabrication of metal and metal products with 12.8%, wood, wood products and furniture with 2.7%, textile, apparel and leather with 1.2%, paper, printing and publishing with 1.2%, chemical, petrol and coal products with 1.1%, non-metal minerals with 1.1% and basic metal with 0.1% (for detailed information see Statistical Appendix, Table 2).

The concentration of units on the food sector is mostly due to the high number of bakeries and grain mills. If these are excluded, the unit share of the food sector drops to 35.0% which contribute 66.4% of gross output and 31.9% of employment (for detailed information see Statistical Appendix, Table 3).

In spite of being outdated and confined to the Northern regions, the Handicraft Industries Survey 1970/71 of the Dept. of Statistics is a valuable source of data on a part of the small industries. The survey defines a handicraft unit as a unit engaged in the production of goods and services without using modern equipments. It identified 19022 handicraft units and covered a sample of 3966 out of these (for their regional distribution see Statistical Appendix, Table 4). Comparing the number of enterprises with the figures of the industrial survey, one can see that the handicraft survey gives more regard to the rural industries: 85.7% of the enterprises are outside of Khartoum province. The share of Khartoum increases, however, when we look at the number of workers and the value of production. Here, the share of the rural areas decrease to 75.07% and 58.55% resp. Assessing these figures, it has to be considered that the survey seems to be confined to full-time activities. Part-time craft and industry activities are more common in rural areas. For that reason, we have to assume that also the handicraft survey is biased towards the major urban area. Moreover, it can be assumed that the survey was confined to major centres in the rural areas. For that reason, the activities which are more common in small villages are not represented adequately. The handicraft survey divides the crafts into 10 different categories (see Statistical Appendix, Table 5). Concerning the numbers of enterprises and workers, "clothes" is the most important category, both for Khartoum and the rural areas. Second are the food production categories ("food production" and "drinks"). Concerning the value of production, they rank first. Other important branches are "ornaments and blacksmith products", "furniture" and "leather, plastic and tannery products".

So far no survey has been done to elucidate the full range of small industries and crafts as well as their distribution by region and by size of settlement (activities of nomads are not included).

## 4.2. The Impact of Government Policies on Small Industries

Two kinds of possible government assistance to small industries or, more general, influence on small industries, can be distinguished:

direct and indirect measures. The direct measures include industry legislation, creation of institutions for finance, training, marketing etc. The indirect measures are those which influence the environment in which small industries operate.

There is a discussion about which of these kinds of measures is more important. There is a lot of evidence that small industries and entrepreneurs are dynamic, motivated, adaptable, and that they have organisational, technical and managerial skills. It is now assumed by many, that the growth potential of small industries can be exploited best in an environment which is characterized by neutral incentives, i.e. a reduction of price and other economic distortions and policies which promote agricultural growth; small industries have strong linkages to agriculture. Various economic distortions (capital market distortions, high and sectorally uneven structure of protection, inappropriate exchange rates, biased investment laws etc.) are affecting negatively the growth prospects of small industries.

On the other hand, direct assistance to small industries faces many difficulties, because small industries are widely dispersed, very heterogeneous in their structure and hardly organized (for a more detailed discussion of direct vs. indirect measures see Hansohm/Wohlmuth 1988).

Like other African states, Sudan gave a priority to the promotion of small scale industries, especially in rural areas, in its different plans (Five-Year-Plan 1970/71-74/75, Six-Year-Plan 1976/77-82/83) in order to widen the productive employment opportunities, to reduce the rural exodus, to achieve social justice and balanced growth.

Unfortunately, these statements contrasted with an actual neglect in terms of policy meaures and allocations. Furthermore, there was no clear responsibility for the promotion of small industries within the administration. More important than the insufficient direct measures of promotion were the indirect impacts of government policy in several fields. Similar to other African counties, there are certain policy biases and market distortions curtailing the development of small industries:

- In the field of industrial policy, the government has a massive influence on the sector through its own strong involvement in industry and through a comprehensive set of regulations and incentives for private investment. Large, capital-intensive and highly import-dependent industries, concentrated in the central

region, were promoted. These industries remained sectorally fragmented and have weak intrasectoral linkages (i.e. linkages between different industries) as well as weak linkages to other sectors, especially agriculture. The industrial policy was neither sectorally integrated nor coordinated with the agricultural policy. This contributed to the weak character of linkages and resulted in paradoxes like raw material shortages for agro-processing factories. During the industrialization process the emphasis was shifted from processing raw materials to a production based on import substitution, especially in the private sector. During this process the overall capital intensity of production increased because of a rise in capital input in existing production processes as well as the establishment of new industries in luxury goods and semi-finished products which are characterized by higher capital intensity. The process of capital intensification and weak employment growth was accompanied by and interdependent with a process of deteriorating income distribution.

- The capital intensity was favoured by a steady and increasing overvaluation of the currency and by the provision of subsidized credits. These had, due to high inflation rates, often negative interest rates. Small industries, however, have hardly any access to these credits. Most of the evidence shows that they have to rely on self-finance or to deal with traditional money-lenders which implies extremely high interest rates.

- In order to facilitate the emergence of a domestic industry the tariff rates for capital goods and raw materials were held low while the domestic production, mostly of luxury goods, was highly protected. This policy constitutes a disincentive for an overall reduction of import dependence. If it is assumed that rural small industries are less dependent on imported capital goods and raw materials, this policy grants an artificial advantage to urban, large-scale industry.

- The second instrument to promote industrial growth is the allocation of the scarce foreign exchange. This allocation system discriminates heavily against small producers who hardly get access. Moreover, most of the government procedures are so complicated, that the formal procedure alone constitutes a barrier for small producers.

- Another discrimination is the license system for imports, which promotes concentration among producers and deteriorates the already

skewed income distribution.

- Many other subsidies to encourage industrial investment discriminate directly against small producers who do not enjoy them or for whom they are irrelevant.

- All these policies are part of a development model which is directed at foreign markets and, in the second instance, at domestic higher income markets. This restricts the market for small industry products which is believed to be concentrated on the low-income population.

- Furthermore, the development of rural small industries was restricted by the urban bias of development policies which impoverished the rural areas.

- The agricultural policy is characterized by a similar pattern as the industrial policy. It concentrates heavily on the modern sectors of irrigation, mechanized farming and cattle-ranching and neglects the traditional agriculture, which still gives a living to more than 2/3 of Sudan`s population. This concentrates a demand constraint for small industries, which find their markets more in traditional than in modern agriculture, concerning production inputs as well as consumption goods. Modern agriculture is highly dependent on imports - for both kinds of goods.

- At the same time, there are also - unintentional - factors furthering the development of some small industries. The industrial crisis in particular and the economic crisis in general resulted in flourishing informal industrial activities. On the one hand, rising unemployment forced people to join the informal sector, on the other hand, products and services rendered by the informal sector substitute for those of the formal sector, because they are cheaper and because of the eroding supply capacity of the formal sector. (For a more detailed discussion see Hansohm/Wohlmuth 1988.)

### 4.3.Finance for Small Industries

The access of small industries to institutional credit is very limited. The commercial banks concentrate their actiities on short-term lending (consistently more than 70 per cent) and the finance of import/export trade (almost half of this). Less than one third of the short-term loans goes to industry. The stagnant share of loans directed to industry is primarily determined by the unfavourable environment for industrial investments which contrasts with potentially high profits in the tertiary sector. This is even more

pronounced for small and rural industries.
Since 1980, however, the Faisal Islamic Bank (Sudan) has begun to take interest in medium-term financing of industries in the small business and artisans sectors. A special branch for this was opened in Omdurman and is operating successfully. However, it does not cover rural areas and it did not alter the pattern of the Faisal Islamic Bank`s activities significantly, which are still concentrated on trade.
It is not to be expected that legislative measures to force commercial banks to direct more of their finance to industry in general, and small industry in particular, will be successful, unless the economic environment in which industries operate, is more promising. And if this favourable environment is created, no administrative measures are necessary to make commerial banks supply credits to industry.
Besides commercial banks, the other sources for credit are government institutions. In 1961 the government established the Industrial Bank of Sudan (IBS) in order to relieve the capital constraint for industrial development. The IBS started operations with a capital of LS 3 mill., in 1984 the capital amounted to LS 7.5 mill. During the period 1962-84 259 loans and 84 supplementary loans were approved. The total IBS contributions came to LS 22.6 mill. which amounted to 47.9 per cnt of the project`s total investment. Ranked by total investment, the most important categories are food processing and ice factory, oil mills, textile knitwear and ready-made cloths, building materials and flour mills. Up to now, traditional industries and very small industries are not covered. Furthermore, the Bank`s activities are highly concentrated on the urban area.
A second source of credit is the Sudan Rural Development Corporation (SRDC), founded in 1982. Its operational area is the whole country except for Khartoum province. The task is to promote and develop small to medium-sized agricultural and industrial projects. The industrial credits are, as in the case of the IBS, directed to modern categories/activities; also they are comparatively large projects - the smallest loan approved was LS 31,000.

5. Small Industries in Nyala

Nyala, capital of South Darfur province, developed from a mere nomadic camp in the early 1920s to the largest urban centre in Darfur and the most dynamic town in the entire Western Sudan. Its population grew from 13986 in 1955/56 (First Census) to 111779 in 1983 (Dept.of Statistics 1988). Presently the estimations on its population vary between 100,000 and 400,000. A reasonable estimate may be 200,000.

The survey on industries identified 36 different industries, including building industry (see Statistical Appendix, Table 6). These industries are very different in many respects: Some of them are traditional and have a very long history, others are of recent origin. Some utilize simple tools, others fairly modern machines. Some are totally self-sufficient, others are highly import-dependent, concerning their tools as well as raw materials. Some are minor sources of income for the workers, others are their sole occupation. For these reasons, it is not useful to discuss their characteristics, potentials and constraints together as small industries, but they have to be analysed separately. In a final step, a comparative analysis of small industries can be done.

Despite their differences, small industries in Nyala can easily be delimitated vis-a-vis large industries. Only one enterprise emerges clearly as a large industry: the textile factory with 195 workers, a public sector project. Among the other industries, the biggest ones are the modern oil presses with 45 employees on an average and the decortication plants with 30 employees on an average. These two branches differ clearly from the other industries by the fact that they are without exception investments by local traders, mostly those engaged in agricultural trade in those products they process (groundnuts, sesame).

The interest concentrated on non-food industries. Among these carpentry and metal work are the most important branches. Metal work, however, consists of several sub-branches which are almost totally separate from each other: the modern workshops including car-repair workshops, blacksmiths, tinsmiths, goldsmiths, foundries and different repair activities.

5.1.Carpentry

This is one of the most rapidly expanding industries in Nyala. The reasons are the high rate of urban growth and the change of life style accompanying the process of urbanization. Traditionally, in the villages, people have very few items made of wood: beds (angareb), stools (bambar), mortars and pestles (funduq). These are made locally and from local materials (wood, leather, fibre).

Apparently there is hardly any modern furniture used in the villages. Also in Nyala most people cannot afford them, because they are very expensive compared to their income. However, despite of the general pauperization, the number of people who can afford modern furniture is increasing.

The industrial survey identified 37 workshops in the Industrial Area (19), on Suq Umm Dafaso (11) and on other markets. Most of the workshops are, however, in the residential areas. Their number had to be estimated. The estimate of the carpenter union is 130 workshops with 390 workers.

For the intensive study 26 workshops were selected, representing the different kinds of workshops identified: 5 in the Industrial Area, 3 on Suq Umm Dafaso, 5 on the other markets and 13 in the residential areas.Main results of the survey are:

- Only 1 producer of traditional wood items (angareb, bambar) was found, although angarebs are still used in the majority of households in Nyala. These products are almost exclusively made in the villages.
- Apart from this, 2 main groups can be discriminated: those working with electric machines and those only working with hand tools. Most of the former group are situated in the Industrial Area.
- The market share of the former group is expanding to the debit of the small workshops in the residential areas. Many of these also depend on the electric workshops, using their turning-lathes. On the other hand, there are some workshops, mainly at Suq Umm Dafaso, who produce very simple and cheap items, partly from second-hand material (small tables, cupboards, boxes for cigarette sale, sieves), directed at a different clientele: low income groups.
- The other workshops produce different kinds of mobiliar: beds, side-boards, cupboards, small and big tables, etc. Formerly, they also made doors and windows. This is hardly done now. Wooden doors and windows are being replaced by metal ware. These are regarded as

more durable and safer.

- Almost all of the workshops are owned by craftsmen who work and/or manage themselves. Of those in the Industrial Area and on the markets only 3 workshops are owned by people not working in the shops, i.e. by traders. It can be assumed that among the workshops in the other areas none is owned by traders. This means that carpentry does not attract investments from outside. Among the workshops in the Industrial Area and on the markets there are 7 joint ownerships. 3 were included in the intensive study.

- Only 2 of the surveyed workshops practiced some kind of book-keeping and only one of them had proper book-keeping. However, no relation was found between book-keeping and business success. The necessary calculations are simple and the craftsmen have a clear consciousness about their costs and profits.

- Only 11.5% of the entrepreneurs have an institutional technical training, the rest were trained on the job. But few regarded this as a constraint. The institutional training (VTC, Technical School) is widely regarded as "impractical" (too theoretical, too sophisticated machines). Furthermore, the graduates of these institutions generally have aspirations which are not fulfilled by working in workshops in Nyala. The standard of training the workshops can offer is best adapted to their needs. There is no considerable potential of improving technical skills without introducing a new generation of technology, i.e. technical skills are not a main constraint.

- The workshop owners are very innovative. Interestingly, they try - successfully - to copy furniture models they see in prospectuses sent or brought by friends from Western countries. Because of this, modern carpentry, which has no relation to the traditional carpentry, as a whole can be regarded as an example of "taste transfer" of Western culture to the South.

- Only 19% of the workers belonged to the family of the workshop owners i.e. the main source of labour is non-family.

- At the same time, the number of family members supported by the income of the workshop owners is high: 6 on an average. This seems to indicate that the degree of integration into the cash economy is still low.

- However, more than half of the entrepreneurs (58%) did not have any agricultural income (farm or animals). Concerning the relation of family and business, it seems that the business is rather subsidizing the family than the other way round. Moral obligations

to support those family members who have less play a big role.

- Hardly any workshop stops working during the rainy season completely. But for the small workshops the main reason for this is that they do not practice agriculture (main reason: low yield expectation), rather than much work. But for the bigger workshops there is not much less demand in the rainy season nowadays, which indicates that Nyala developed into a big centre of non-agricultural income earners.

- 60% had no other source of income, one was also engaged in trade, one in the government service.

- There is a high fluctuation of labour. 57% of the labour force were stated to be "permanent" at the first interview, but this turned out to be a relative term.

- The only cooperation between workshops is the use of turning-lathes, which implies a loss of income for the non-electric workshops, but it is neither a major source of income for the electric workshops nor is the fee unduly high. There is no subcontracting. If a workshop gets an order which exceeds his labour power, he engages additional labour.

- The labour market is rather flexible and works informal. Unskilled labour is abundant, but skilled labour is more difficult to find (claimed by almost half of the entrepreneurs). The reason for this is that the wages are rather low compared to the profits. As a result there is a high incentive to open an own workshop, which is quite possible because the investment for at least a non-electrical workshop is not high. Also the fact is important that the propensity to work as such is comparatively low. This is possible because for most people their family can provide the basic needs at least for a while, there is no ideology implying a work morale. This is the reason for the high fluctuation of labour.

- In contrast to traditional wood work, modern carpentry is rather import-dependent, concerning tools and machinery as well as raw materials. The most common electric machines are saws, turning lathes and drilling machines. Some of the first two kinds are assembled in Nyala workshops, but otherwise they are imported. As hand tools hammers, saws, screw-drivers, plainers, vices, files, piercers, tongs etc. are used. Of these, only hammers are made locally, however most workshops use imported hammers. Very few and only small electric tools are available in Nyala market. They or the necessary parts (electric motors) have normally to be brought from

Khartoum or abroad (Libya). Also the hand tools are not regularly available in Nyala. Furthermore, there is a high scarcity rent appropriated by the traders. The market is oligopolistic. Supply could be made more steady and prices could be brought down by a collective purchasing by the producers.

- The most commonly used kinds of wood are Gimbil, Sandal Radom, Himmeid (from South Darfur) and White Wood (from Central Africa or USSR). Other kinds of wood as Mahagony, Teak (from South Sudan), Haglid and Serrou (from South Darfur) are seldom available in the market. For the local wood (Gimbil, Sandal Radom) the supply declined over the years, which is reflected in rising prices. They are not constantly available in the market. This is different for Himmeid, which is cheaper but of worse quality. It is mostly used by the small workshops in Suq Umm Dafaso which supply the low income market.

- Most of the other raw materials are imported. The only exceptions are varieties of glass and mirrors, colours, nails, metal pipes and wood polish. For everything except wood polish (presently) there is the choice between domestic and imported brands. Generally the imported brands are preferred because of better quality, sometimes at comparable prices.

- The prices of the imported raw materials increased very much during the last years due mostly to deteriorating terms of trade. However, these increases have been aggravated by scarcity rents due to transport difficulties and the oligopolistic organisation of the market. At the same time the carpenters face cash shortages so that very few are in a position to buy big amounts of raw materials in advance.

- For this reason, all of the carpenters work on order: 23% for the minor part, 46% for the bigger part and 31% completely.

- There are different modes of payment for the raw materials. Less than half pay immediately in cash (sometimes), in most cases the clients pay a part of the price in advance, 12% use trader credits, in all but two workshops the clients provide the raw materials (sometimes). This pattern reflects the lack of capital.

- Almost none of the workshops work continuously, but they have an excess capacity. This is due to: 1.the combined effect of lack of demand and lack of raw materials (i.e.lack of capital) and 2.occasional electricity cuts (this is a minor problem nowadays).However, it was found that the economic concept of "excess

capacity" is not transferable to the Sudanese economy (society) in its strict sense. The concept implies the aim to work continuously, i.e. to make a maximum use of one`s own and the workers capacity to work. The economic rationality of the craftsmen is, however, different. Both the expected revenue and the necessary effort have their value and a balance between them is struck.

- Because of a lack of previous statistics and studies no exact information can be given on the past development of carpentry. But it is obvious that a continuous expansion has taken place, and it will continue in the future. In the early 1950s there were only 3 workshops in Nyala - now there are far more than 100. This has, however to be qualified by the fact that 32% of the interviewed workshops reported a production increase compared to the last years, while 44% complained about a decline and 12% reported constancy (12% were too young to answer this question).

The overall expansion of carpentry production is a function of increasing demand as a result of the change of life-style accompanying urbanisation and the increasing incomes of an emerging middle-class. Despite the deepening economic crisis in Sudan and South Darfur`s ecologic-economic crisis resulting in increasing raw material prices and declining general purchasing power the demand for modern carpentry products will further expand. This demand will continue to be satisfied by Nyala workshops (which also have their markets in other places, mostly in Darfur). No competition from Greater Khartoum or abroad will threaten their expansion. This is a positive development, however, it must be noted that modern carpentry cannot be regarded as a part of a basic needs strategy able to correct the distorted structure of Sudan`s economy. It is directed at the higher income strata and thus merely reflects and strengthens this structure (growth with inequity).

- The linkages to agriculture are weak. On the raw materials side, most are imported, and the domestic link is of a fragile and doubtful nature (deforestation; however, its contribution is small compared to that of firewood for private and bakery use). The consumption link is almost non-existing, because farmers cannot afford to buy furniture.

- In the field of carpentry there is no competition by large industry, nor by imports. In future it can be expected that the technological level and the quality of furniture will improve in line with increasing demand. However, the majority of the non-

electric workshops will either be able to electrify or be driven out of the market. This does not apply to the workshops which address low-income groups with low-quality and inexpensive products.

- Almost all of the workshops are completely self-financed, only one obtained a credit from a merchant. As far as electric machines are concerned, their finance was partly earned abroad. 36% bought partly second-hand machines. Most of the shops expanded over time, i.e. they use more machines now than at the time of establishment. Presently no one has other sources of finance. No one ever tried to get a government or bank credit. This is, however, due to the unfavourable credit conditions; more than half would be interested in a credit on reasonable terms (longer term, lower rates).

- 36% of the enterprises had a license (24% paid taxes), i.e. the rest belongs to the "informal sector". Most of the electrified workshops are licensed, but otherwise there are no significant differences between licensed and unlicensed workshops.

- 72% are organised in the SCSEU and/or carpenter`s union. This is a high degree of organisation, which is favourable for any kind of support, e.g. a programm of raw material supply or a credit programm which needs to take some form of collective responsibility because most of the workshops are too small to be credit worthy.

- In conclusion, the main constraint is raw material supply. A programme of collective supply of raw materials - and, in a later stage, tools and machines - from Greater Khartoum and direct import which should be combined with a credit programme would increase production, incomes and employment by reducing prices and thereby expanding markets to the broader population.

## 5.2.Modern Metal Workshops

The metal industries consist of several branches, which are almost totally separated from each other: modern workshops, blacksmiths, tinsmiths, goldsmiths, foundries as well as different kinds of repair shops (repair of bicycles, watches, electric machines, radio & tv, car electricity). Among these, the modern workshops are by far the most important, in terms of employment as well as production.

In December 1987/January 1988 there were 155 metal workshops with 820 workers, 89 of them only active in car repair (with 485 workers) - while car repair is a major activity of many workshops.

With the exception of only one workshop all are situated in the Light Industrial Area. 34 shops were selected as case studies, 11 of them working in car repair exclusively, and 8 working in car repair and other metal work activities. The main results are:

- Except for one workshop (Halatu) the modern workshops are totally separated from the traditional metal work. They produce different goods, work with different tools, they do hardly cooperate, they are different people. Halatu is the only one who developed from a blacksmith to a modern workshop - the only workshop making agricultural implements, in cooperation with blacksmiths.
- The workshops produce mostly consumption goods - furniture (chairs, small and big tables, beds), windows, doors, cupboards, refrigerators - and lorry boxes, water tanks, metal supports for house-building. To a small extent few shops also build production goods: groundnut decorticators, spice and snuff mills. 2 shops make carts. The production of furniture, windows and doors is predominant.
- Only two workshops were owned by people not working there, i.e. by merchants. This means that also this sector does not attract investments from outside. There are 20 joint ownerships, 14 of them in car repair shops.
- 6 workshops practiced a kind of book-keeping, but no significant difference was found between those with and those without book-keeping. The entrepreneurs have a clear consciousness about their costs and their profits. Book-keeping will not improve their business success. The entrepreneurs are completely aware of the economic conditions under which they work, e.g. the different market prices, although these may change rapidly.They know well how to manage with all the different constraints and how to adapt to changing conditions. This means that "organisational skills" and "adaptability" cannot be regarded as a constraint to their expansion.
- Only 7 of the entrepreneurs (case studies) obtained an institutional vocational training. But this does not seem to be a constraint. Only one of them mentioned training as one of his major problems. The informal training system of the workshops (41% of the workers are trainees)works efficiently, low cost and it is adapted to the needs of the workshops and to their machines. At the same time, many of the entrepreneurs complain about the "too theoretical character" of institutional training programmes and the fact that often students are trained on machines which are not available to them. Furthermore, the work expectations of the graduates can in

general not be fulfilled by the local workshops. An institutional training would only make sense as a part of a programme introducing new technologies to the workshops. Even then, a programme of training on the job would probably be more successful. The training cooperation between the SCSEU Nyala and the Youth Rehabilitation Project Nyala is a case in point for the success of training on the job.

- Among a total of 164 workers (case studies; excluding the owners, who normally also work) only 20, i.e. 12%, are family members. Family labour does not play an important role.

- On the other hand an average of 5.7 family members depend on the income of one entrepreneur. This means that they have no other money income. Of course some of the other household members work, e.g. household work, subsistence agriculture, but to a surprisingly low degree (see below). This can be interpreted as a low or positive relation between work and leisure (taking the family as a unit).

- 13, i.e. 38%, of the entrepreneurs and their families have farms, which produce food for own use (one also for the market). 21, i.e. 62% have no other income. Among the others, 5 (15%) stop their industrial work in the rainy season to work on their farms. One has a share in another workshop and one is engaged in trade. But for all of those with additional sources of income their workshop is the major source.

- The repetition of the total survey during the rainy season showed that the number of workshops declined to 140, i.e. by 9.7%, and the number of workers to 671, i.e. by 18.2% (see Table 6). This was a surprising result. It had been expected that the seasonal variation would be much stronger, i.e. that much less people would work during the rainy season. These results mean that the industrial labour force in this sector has become fairly independent (from family as well as agriculture).

- Unskilled workers abound, concerning skilled workers 15% claim that they are difficult to find. The labour market is very instable, i.e. many workers are very mobile. Although at the first visits it was claimed that 88% of the workers are "permanent", it turned out that quite many change their jobs rapidly, both within their branch and changing to other professions. This reflects the economic decline and instability, a high degree of social mobility and the comparatively low wage, which encourages workers to open their own workshop. The labour market is almost completely informal, i.e. the

Labour Office is hardly involved in the labour exchange in the industrial field, but labour markets work efficiently.

- There is very little subcontracting or other kinds of cooperation. Most of the work is directed at the final demand. The enterprises work independently. If a big order surpasses their labour power, they will employ additional labour.

- Among the case studies 8 (24%) do not work with electric machines; these are cart producers or car repair shops.

- The only tools locally made are hammers (however, most use the imported ones) and wedges; both are made by blacksmiths. All the other tools and machines are imported. The most commonly used electric tools are welding machines (also gas welding machines are used), drilling machines and polishing machines.

These are generally not available in Nyala, but in Khartoum. Due to inflation and other factors the prices increased steeply during the last years. There is also a high price difference between Nyala and Khartoum, due to the transport difficulties - especially during the rainy season - and the oligopolistic market. Both an improved infrastructure (e.g.tarmac road) as well as a collective supply from Khartoum by a cooperative of the producers would improve the situation, lower the product prices and enlarge the market. Except for few hand tools as hammers there seems not to be a potential for local manufacture.

- The situation concerning raw materials is similar. Iron rods, tubes, beams, sheets, locks etc., almost everything is imported. Only one kind of tubes and nails (both of minor quality) are produced in Greater Khartoum. The raw materials are mostly available, but at a high scarcity rate. The constantly changing prices reflect the changing supply situation. Although the number of merchants dealing in raw materials is quite high, there is a tendency of hoarding in order to push up the prices. This is, of course, on top of the "normal" constant price increases. Some of the owners of the bigger workshops use to travel to Greater Khartoum every few months to buy raw materials there. However, for most people this way is not open because of lack of cash.

- Because of this lack of capital several modes of payments are co-existing. 50% pay (part of) their raw materials immediately in cash, 65% demand advance payments from their clients, 41% use trader credits, 44% have the raw materials provided by their clients.

- This pattern results in a production on order, which all of the

case studies practiced: 21% for the minor part, 47% for the major part, and 32% exclusively.

- 15% stated to work continuously during the working time, while 85% stated not to do so, i.e. to have excessive capacity. However, there is no distinctive difference between the two groups, the difference in the answer is more due to the respondents personal view on the matter. As mentioned in chapter 5.1., the concept of "excess capacity" cannot be transfered strictly to the Sudanese economy. The concept implies a certain view on the use of labour power, namely the aim to make maximum use of it. This view is, however, not prevalent among the craftsmen. They rather take their decision on the appropriate amount of work to do on both criteria together: the economic benefit and the necessary effort. This means in practical terms that in order to arrive at a higher capacity utilization through a higher labour input higher benefits have to be given.

Different means were taken to get an impression about the capacity utilization: observation and various indirect questions. The conclusion is that there is a low utilization of the installed capacity (especially during the rainy season). The main reason for this is that the supply exceeds the demand. The demand is sluggish because of declining incomes of the broad population. There is a substitution effect of new metal wares by goods made of scrap, partly made by tinsmiths. Despite declining incomes in metal work, comparatively to other sectors the craftsmen are still well off; it is still worth-while to open new shops.

- While the number of workshops grew, the picture of their internal growth is mixed. 68% are using more machines now than at the beginning. 24% had more workers some time before than now. 38% increased their production compared to the last years, 6% evaluated it as equal, and 50% produce/repair less now (6% were too young to be asked).

- The most immediate constraint is the supply with raw materials. An improvement of the infrastructure - in the long run - and a collective supply through a collective organisation of the producers are ways to remove the scarcity rents and in this way to broaden the market for metal goods. The SCSEU is a functioning organisation which set up a company for the import of raw materials last year. This attempt should be supported by the government and by development agencies (import licenses, finance).

- The long-term growth potential of the sector is determined by the development of incomes in Nyala and Darfur. If the incomes of the broad population will increase, the demand for metal consumption goods as well as for the different repair services will increase. If the demand increases, the entrepreneurs of Nyala are well equipped to respond by increased production: a sufficient pool of labour force is available as well as the necessary knowledge. No competition from products made in the Three Towns or from outside will threaten their position.
- All of the entrepreneurs relied on their own and/or their families finance when they established their workshops; only one took a bank credit (as a secondary source besides his own capital). Except for 3 all finance their present operations exclusively by their workshop profits. 44% however would be interested in a credit if more favourable conditions were available.
- 47% of the enterprises were licensed, as a rule the bigger workshops. But licensed and unlicensed workshops cannot be segregated as two clearly different groups.
- 82% of the workshops were organised in the SCSEU, which is thus in a good position as an instrument of support for the craftsmen.

5.3.Blacksmiths

Formerly most of the blacksmiths used to work at the central market, Suq Umm Dafaso, but some years ago they were resettled by the town council to a new market at the outskirts of the town, Suq ash Shabi. Other blacksmiths are scattered at other markets, the industrial area and in the residential areas. In winter 1987/88 the number of blacksmith units in Nyala was estimated at 67 with 180 workers, during the rainy season the numbers dropped to 58 and 131 resp. (see Stat.App.,Table 6). 13 blacksmiths were selected as case studies. Main results of the study are:

- The blacksmith trade is very different from other kinds of metal work, regarding technology, raw materials, housing, work organisation, markets and other aspects.
- They mainly produce agricultural hand tools - axes, different kinds of hacks, different kinds of sickles, sowing tools, scratchers (for gum arabic) - and other tools: small and big hammers, different kinds of wedges, small and big tongs, trowels, pestles, knives, swords, points of speers, scissors. Also they produce weights,

harnesses for horses etc. as well as dancing instruments. By far the greatest part of their production is directed towards agricultural production. In this field since about 20 years the production of animal drawn equipment (camel and donkey drawn ploughs) is spreading slowly. The plough is apparently the only innovation.
Concerning the hand tools, there is no great scope for improvement. As innovations, drills and tyre levers could be introduced.

- The pattern of tools is fairly uniform: an anvil, bellows, big and small hammers, tongs and wedges. All of the tools are self-made. The only exception are files used by some workshops. The tools are made from car scrap, the bellows from local wood and local skin.

- Two kinds of raw materials are used: car scrap and charcoal. The scrap is bought in Nyala market, from traders (about 4), metal workshops and, to a small degree, from lorry assistants. The traders are the most expensive source. All of the blacksmiths pay immediately in cash. Only 2 use sometimes advance payments by clients. 38% use sometimes trader credits, 54% have sometimes the raw materials provided by the clients. The supply of scrap is expensive and irregular, especially in the rainy season. This is reflected in price fluctuations (40-175 LS/quntar). Because of a lack in cash the blacksmiths can only buy small amounts of scrap at a time and thus have to buy frequently. Sometimes they have to stop work due to raw material shortages. There is a potential of increasing the supply by a proper organisation. Possibly scrap from the railway can be used, besides that from different government workshops in Nyala. Demand going beyond the material available in Nyala could be supplied by a collective organisation from Khartoum. However, the difficulty is that the blacksmiths are generally not organised.

- The charcoal is sold in Nyala by people bringing it from the countryside. The supply is sometimes difficult in the rainy season. The price fluctuates between 17 and 30 LS/sack.

- The blacksmiths generally work in groups of two, sometimes three, which is necessitated by the work. Some tasks, however, can be done individually, e.g. sharpening of spears. In the blacksmith trade, there are no stable units of work. Generally, the individuals are independent. They combine their resources according to the arising needs. This combination may take different forms: two blacksmiths may share their profits, one blacksmith may employ another one or even several units (he may take part in the work himself or not), in

this case he will pay them per piece (this is prevalent) or per day.

- Family work plays an important role. 74% of the blackmith units on the markets and the industrial area take all or part of their labour from the family, 47% of the labour force are family members (6 were working alone at the time of the first survey). Among the case studies, 75% of the units take all or part of their labour from the family and 86% of the labour force are family members.

- Compared to modern workshops, the number of family people supported by the income of one blacksmith(entrepreneur) is low: 3.5. Only 62% have a family farm (only for subsistence), only one stops to work as a blacksmith during the rainy season; for all of them the blacksmith work is the main income source. Almost a third (31%) have no other source of income. This high and, compared with the past, increased reliance on the blacksmith trade as income source is the result of two factors: diminishing returns from agriculture (due to ecological and agricultural price policy factors) which made people leave agriculture and an increased demand for their products which is reflected in a comparatively good income.

- The weekly incomes of blacksmiths in summer are about 300-400 LS. There are no big variations between the blacksmiths. There are great variations over time, however - according to demand. During the rainy season there is much less work, on some days there is no work at all. The average income during the rainy season is estimated to be 1/2-2/3 of the summer income.

- There are two different kinds of employed blacksmiths: skilled workers and "students". However, there is not a strict differentiation between them. They are paid on a daily basis or per piece. In any case, the payment varies in accordance with the income of the workshop - sometimes there may be no income at all. Otherwise, for the students it varies between 10 and 50 LS/day, for the skilled workers between 30 and 75 LS/day. If a blacksmith employs another one, the relation between the incomes of the former and the latter is about 2-3/1. This is why blacksmiths do not prefer to be employed, but rather to work on their own account or to share their profits.

- More than half described their income as good, only two as not sufficient.

- This result is confirmed by the blacksmiths' social mobility (job history, father's work). While in the past the blacksmith trade was practised only by few ethnic groups and has often been described as

a "despised" work, this image is increasingly breaking down. 5 ethnic groups were identified among the blacksmiths (not including the workers; however, 62% of them are Tama); the fathers of 77% were doing the same work; 23% had worked in another line before. Still people, especially those who enjoyed formal education, are looking down on manual labour in general, and this "dirty work" in particular. However, there are exceptions to this attitude - people who leave other occupations, evaluating their different options according to their economic value. This process of modernisation is reinforced by the declining incomes in "white collar" jobs.

- The level of formal education is very low: 46% had none, another 38% were educated at khalwa (Koran school), and 16% went to school for 3 years. However, concerning their work, this does not appear to be a deficit. They are not able to keep books, but for their business this is not necessary. For their work, all are trained on the job. There seems not to be any scope for improving products or efficiency by training without an introduction of new tools and technologies.

- The supply of skilled workers appears to be sufficient.

- There is not a high excess capacity here as in the modern metal workshops. Although only 2 (15%) stated to work continuously, this does not distinguish them from the others; it rather reflects a different understanding of the question. Blacksmith work is rather exhausting; frequent pauses are necessary.

The excess capacity is better reflected in the fact that few work only on demand (23%), the others work more - but not exclusively - for the market. Most would work more if there was more demand, but there are at the present level of technology limits to additional work.

An interesting recent experience of the WSDC illustrates the economic rationality of the blacksmiths: the blacksmith contracted to make 200 seeder weeder parts (with a team of 6) worked through Ramadan (at night). However, towards the end of the work, the team became more and more reluctant, despite - or better because - of the relatively high material reward. This confirms that the cause-effect relationship between the economic environment and the economic behaviour of the producer has to be seen as a reciprocal relation. The amount of work the blacksmith is ready to supply is dependent on the hardship of the work, the money to be earned and the commodities which can be bought with this money.

- There is no exact information about the past development of the blacksmith trade because of a lack of previous studies. However, it is clear that the number of blacksmiths in Nyala increased during the last years. Almost 2/3 of the case studies produce now more than in the years before. More than half reported an increased demand, 1 a constant demand and the rest a decline. Of these, most attribute the decline to the higher number of workshops.

The future of demand has to be seen in the context of the region's agricultural development: blacksmiths produce mostly agricultural tools, the other products are bought by people dependent directly or indirectly on agriculture. If agricultural incomes increase - which is dependent on ecological development, prices and general agricultural policy - the drain of rural people to the towns and cities will decrease, agricultural work will become more worthwhile and the demand for agricultural tools will increase. More important, more people will be in the position to afford a higher technological level of agricultural production, i.e. animal drawn equipment which is produced locally. This could give a push to the blacksmith trade.

- All the blacksmiths relied and rely on their own - or their families - savings to finance their tools and their current work. No one tried to get a credit. Some (31%) expressed an interest in a credit programme in order to improve the supply of raw materials. Because of a lack of formal status and collateral this credit programme could only be organised in a collective organisation. This is, however, not as yet existing.

- Less than half of the case studies have a license; concerning the other characteristics, these do not form a different group from the rest.

- Concerning the future development of the blacksmith trade, the government has a crucial role to play. Past efforts have shown that blacksmiths are able to increase the quantity and quality (standardization) of their products. At the present standard of technology they are able to produce improved agricultural tools. Because they do not have an own organisation, the government could play an active role in relieving the raw material constraint by supplying scrap from its different departments (railway, mechanical transport dept.) in Nyala and possibly Khartoum. However, the most important constraint to a future expansion of the blacksmith trade is the demand. Low incomes impede the spread of intermediate agricultural technologies among farmers. Those low incomes are due

to different factors, among them ecological and international economic factors. However, a prominent factor was government policy: in the past there were certain biases: against agriculture, against smallholders, against peripheral areas. A revision of these biases would give a boost to agricultural incomes and thus stimulate the blacksmith trade.

5.4.Tinsmiths

This is the other kind of traditional metal work found on the markets. In the first survey in winter 1987/88 21 units were identified with 55 workers, in the rainy season 21 units with 39 workers. 11 units with a total of 21 workers were selected as case studies, 7 of them work alone. Main results of the study are:

- Tinsmiths produce small and big metal boxes, cans, different containers, tables, windows, doors, ovens, filters, lamps, washing bowls, water outlets, measuring instruments, baking forms, pestles, and trowels. Furthermore, they build houses (shops). Their products are fixed by soldering, riveting and nailing. Most of their products are inexpensive substitutes for imported products or products made by the modern workshops. Examples for the first category are toilet cans, ovens and trowels, for the second category tables, windows and doors. Besides production, tinsmiths also work in repair.
- Tinsmiths work exclusively with hand tools. The standard set consists of hammers (partly of local origin, but mostly imported), wooden hammers (local), blowpipes (local), wedges (local) and tongs (local or imported). Furthermore, rails (from the railway) or metal tubes (local) are used as anvils. Other tools used by some of the craftsmen are pairs of compasses (local), scissors (local), saws (imported), tape-measures (imported) and files (imported).
- The tools of local origin are bought from the blacksmiths, the others are bought on the local market. More than half of the tinsmiths (55%) bought all of their tools new, while the other 45% bought all second-hand. As the standard set is or can be quite inexpensive, all tinsmiths paid from their own sources or from family credit.
- The most common raw materials are oil tons (new or second hand), thin metal sheets (new or second hand: food oil containers), rivets, tin flux and soldering solution. Also used are remnants of metal sheets obtained from modern workshops, tin sheets (second hand), metal strips (second hand: packaging material), zinc sheets (second

hand: remnants of shops), nails and colours.

- All the raw materials are obtained on the local market. Different modes of payment are used: immediate payment (used by all), advance payment by clients (18%), trader credit (18%), raw materials provided by clients (36%). Because of cash shortages small amounts are bought, and they are bought frequently. There are many traders and other sources for the raw materials (no specialised traders). However, the raw materials are not always available, and for that reason, tinsmiths sometimes have to stop their work. The availability of raw materials is the most often mentioned problem.

- Except for the building of houses (shops), the tinsmith work is done individually. This is why many work alone. Tinsmiths engage other workers according to the demand for their work. Work units are not stable. Workers are recruited informally. No shortage of skilled workers is reported.

- The importance of family labour is very low. Only one of the employed tinsmiths belongs to the family of an owner.

- Each tinsmith supports with his income 4.1 family people. More than half (55%) of the families have a farm, half of these only for own consumption, the other half also for the market.

- For all the tinsmiths trade was the main source of income. 45% had no other source, the others also continued this work during the rainy season.

- The tinsmith sector is not as homogeneous as the blacksmith sector. Incomes vary, corresponding with kind and quality of work, available tools and educational background. At the bottom are those who only do repair work, at the top those building shops and making high quality travel containers. The former group has a high excess capacity.

- 18% have no school education, 27% went to khalwa, while 54% went to school - between 3 and 12 years.

- 18% formerly worked with the government, while the others did not work in another line. This shows that in the tinsmith trade a good income can be made - with (comparatively) high-income goods: shops and painted containers.

- A high social mobility is also shown by the father's work: 55% were farmers, 27% with the government and each 9% workers and merchants.

- The heterogeneity of the sector is also evident in the different developments of the size of production: for 27% it increased, for

36% it remained the same, and for 36% it declined.

- The heterogeneity is also reflected in the importance of production on order: 27% do not produce on order at all, 36% for the minor part, 27% for the bigger part, and 9% exclusively.

- To finance their tools and their current operations, all relied completely on own or family finance. Only one (with the highest income) also had finance from trade (in the same products as he made). Two (at the top) expressed an interest in a credit programme.One characterised finance /credit as a main problem.

- Two tinsmiths in the upper half also grew in terms of available set of tools, while the others remained constant.

- As mentioned above, the principal problem identified by the craftsmen was the supply with raw materials. The demand as a problem was only mentioned by two, although from the production history it is clear that this is a major problem for many. Different and contradicting factors are determining the overall demand for tinsmith products. On the one hand there is a substitution effect for expensive doors, windows, tables etc. made of new metal by inexpensive products made of second hand material made by tinsmiths. On the other hand, there is a decline of demand because of the general declining standards of living, affecting especially the low-income groups. The second effect is obviously stronger. The reason for this is that the tinsmiths products are predominantly directed at the low income groups. The substitution effect favouring the tinsmiths is not very strong, because many people even cannot afford those more inexpensive products the tinsmiths offer.

- The income was characterised as good by 27%, as sufficient by 18% and as not sufficient by 54%.

- For the future 72% planned to continue their work, 9% planned to expand, and 18% wanted to change to another activity.

## 5.5.Foundries

In contrast to the blacksmith and tinsmith trades, the foundries are exclusively situated in the residential areas, strictly speaking only in one residential area: Haj al Jebel. There are approximately 9 foundries in Nyala with 39 workers, during the rainy season only 3 with 18 workers were operating. Two foundries were visited. Main results of the study are:

- This trade is exclusively practised by West Africans ("Fellata"),

who brought this knowledge from their native country. The foundries are integrated in their homes. The foundries are family businesses. All workers of a foundry (3-6) belong to one family.

- They mainly produce aluminium pots of different sizes. These are still very popular with most people despite the spreading of many kinds of imported pots. This is because for the cooking of the traditional dishes on the traditional charcoal oven they are superior to the imported pots. Of less importance is the production of scoops and spoons.

- The products are made of second hand aluminium. There are only small quantities available in Nyala. Most of the aluminium is bought in Khartoum, where a member of the working team is sent every few months. The other raw material needed is charcoal, which is brought by traders to the foundries or bought locally. There are shortages of charcoal during the rainy season.

- The necessary tools are all locally made or they could be locally made. The furnace is self-built. Tools are tongs (local), hammers (local or imported), shovels (imported), buckets (imported and self-made), scoops (imported), wooden and metal bars (local), wooden forms (self-made).

- A secondary source of income is agriculture. During the rainy season, this work has priority, but the foundries continue to work.

- The foundries sell mostly or exclusively to traders. The market is primarily Nyala town, but also its hinterland (Darfur). The foundries work partly on demand of traders, but more for the market. There are no interruptions of work because of lack of demand. The demand for pots increased, due to urbanisation and population growth. Compared with the years before, the production of the two visited foundries increased. For a long time to come, the demand for these pots will increase. It is, however, linked to the fate of the charcoal oven. The local aluminium pots are not suited to electric ovens which are, however, used by very few people.

- When the raw materials (aluminium) are finished, work is interrupted until a member of the team has returned from Khartoum with new raw materials. The necessity of this interruption is due to a lack of capital. Both of the two visited foundries are interested in a credit programme for the supply with raw materials. The supply with raw materials is the only problem the foundries have presently.

- The foundries belong to the "informal sector", i.e. they do not have licenses and do not pay taxes.

5.6.Tanneries

Like the foundries, the tanneries are situated in Haj al Jebel and run by West Africans ("Fellata"). Presently they are all at one site. At the time of the first survey 120 people were counted, working in 6 units. During the rainy season, their number had dropped to 24. Two were interviewed. Main results are:

- Cow, sheep and goat hides are tanned, seldom also snake hides. For this process water, a locally available tree fruit called "garad", salt, atrun and lime are used. All of this is of local origin. The garad is pounded at the site by women (7-8), who are paid per sack by the tanners. The other chemicals are bought in the local market (immediately paid). The skins, also from the local market, are either paid immediately or after the work. Sometimes there are shortages of skins, especially those of the best quality, because of traders who export skins to Khartoum. The quality of hides is sometimes bad (holes in the hide). The supply of good quality hides is the main problem of tanners. Other raw materials are sufficiently available.
- The skins are washed and tanned in big holes in the open. All the work is done outside. During the rainy season, most people stop to work in order to practice agriculture. However, the interviewed tanners did not work in agriculture.
- The tanneries also belong to the "informal sector". The tanners do not have licenses, do not pay taxes , and do not own their workplaces.
- All the tools - different kinds of knives and tongs - are made locally (by the blacksmiths). The supply is always sufficient.
- The tanned hides are sold to traders in the market. They are mostly processed to leather-ware in Nyala, otherwise elsewhere in Darfur. The future demand perspective of the tanneries are dependent on the development of the local leather work.

5.7.Leather work

In terms of employment, leather work is the most important among the indigenous, traditional crafts in Nyala. The survey in winter 1987/88 counted 147 enterprises with 254 workers. During the rainy season, the numbers dropped to 72 and 155 resp. (see Statistical

Annex, Table 6). Three craftsmen were taken as case studies. The main features of leather work are:

- The main products are leather shoes. Besides that water sacks, bags and other containers, bracelets, knive and sword sheathes, harnesses for horses and other riding or draught animals are made.
- Their tools are almost all locally made. Those which are imported are substitutes for local tools : shoe forms, shoehorns, wooden anvils, wooden hammers, wooden sticks, scissors, (local), hammers, knives, tongs, needles (local or imported), brushes, paint-brushes (imported). The necessary set of tools is not expensive. Tools are readily available in the local market.
- The most important raw materials are goat and cow leather, bought in the local market and for the most part tanned in Nyala. However, there are complaints about the quality of local tanned hides. The tanneries in El Geneina are known for a better quality. However, hides from El Geneina are not always available in the market, in contrast to local leather.

Seldom snake and leopard leather are processed.

Mostly the leather is paid immediately, however, also other forms are practised : trader credit (only 1/2 paid immediately), clients pay 1/2 before, clients bring the raw material. This reflects a cash shortage on the part of the leather workers.

- Traditionally the shoes were completely of local origin. These shoes are still available. However, local leather workers have adapted to a great degree to changes in tastes and there is a great variety of locally made shoes in the market, with different degrees of import content. Imported raw materials are nails, glue, synthetic materials for soles, thread. The imported materials are not always available in the market, which forces leather workers to stop work sometimes.
- The drop of leather workers in the rainy season by 39% reflects the degree of reliance on/independence of agricultural incomes. It can be assumed that most of the craftsmen working in the rainy season do not have any work and income in agriculture.
- Most of the leather workers produce partly on demand, but mostly for the market. In spite of a strong competition by domestic factory shoes made in Greater Khartoum and inexpensive gum and plastic sandals, local leatherwork has maintained its position. This is partly due to a high flexibility craftsmen have shown to adapt their products to changing demands. Qualitative improvements in local

tanning and a steady supply of raw materials at reasonable prices would further improve the position of local leather work.

5.8.Gum and Plastic Products

This sector consists of two distinct parts: one factory making plastic containers for food oil with a semi-automatic technology and craftsmen making sandals out of worn-out tyres. The second category is not important in terms of employment, but interesting as an example of an indigenous, but modern industry adapted to local resources availability. In winter 1987/88 there were 59 craftsmen in 42 units on the markets, in the rainy season 29 craftsmen in 23 units. The main features are:

- The raw materials are worn-out tyres, mostly from lorries, rivets and nails (imported). The tyres are bought directly from car assistants who bring them to the craftsmen. They are less available in the rainy season. Also the supply had been better in the years before. The rivets and nails are bought in the local market. They are also not continuously available, especially in the rainy season, and the supply was better in the years before. Sometimes the producers have to stop work because of lack of raw materials.
- The craftsmen work with a kind of anvil, knives, scissors (local: blacksmiths), hammers (local or imported), punch pliers, tongs, whetstones (imported). The tools are readily available in the market.
- The craftsmen produce partly on demand, but mostly for the market. A considerable part is bought by traders for sale outside of Nyala. The number of gum shoe producers has apparently increased in the last years, which reflects an increased demand. This is due both to population increase and wide-spread impoverishment which makes people substitute gum shoes for leather shoes.

5.9.Other industries

Among the other industries, food processing industries are the most important. For an overview of all industries see Statistical Appendix, Table 6.

Of special interest are those activities carried out by women (as in most other fields, industrial activities are strictly sexually segregated). Women are working in the textile factory, in

decortication plants, oil presses, in the soft drinks and ice factory. They are working exclusively in the fields of pottery and palm leaves products. These activities are mostly carried out at home. They are secondary activities. However, in the case of potters it was found that pottery is the sole income source during the dry season for many people. There are many female-headed families which do not get any support from their husbands who left in search of work. In general, while the women's role in the cash economy is increasing, there is a lack of appropriate income earning opportunities for women.

5.10.Conclusions

Among the preliminary conclusions are the following:

1) Some widely held beliefs concerning small industries have to be qualified:

"They cater for low-income markets." The incomes of many people are so low that they prohibit the purchase of almost any industrial goods. On the other hand, some industries, e.g. carpentry, cater for high-income markets.

"They use largely local inputs." This is only true for the traditional industries, which are of little importance compared to modern industries regarding production and employment.

"They can be a source of indigenous capital goods." Local industries are presently predominantly oriented towards the production of consumer goods.

"They have strong linkages to the agricultural sector." This is only true for traditional industries. Many industries are highly import-dependent.- The production of improved agricultural implements is not yet of much importance, although presently some encouraging trials are made. In general, linkages to agriculture are weak.

2) Also inter-sectoral linkages are weak. Most produce for the final demand.

3) A classification of the industry in "formal" and "informal" sectors is not useful because there is no distinct difference between these two sectors; rather the industrial enterprises have to be viewed along a continuum. Except the textile factory, all local industries have to be considered as small.

4) Small industries in Nyala have shown considerable growth, however, due to the general economic situation, this growth has mostly been of an involutionary character, i.e. incomes have declined.

Presently, in many branches there is much excess capacity.

5) At the same time, compared to incomes in the formal sector (mostly government), industrial incomes increased relatively. As a result, industrial work has become more attractive. Socio-cultural factors cannot be regarded as factors constraining development.

6) Almost all of the investments come from within the sector. There are only few cases of investments from outside, e.g. the trade sector or Sudanese working abroad.

7) The principal constraints are often the supply of raw materials and demand, rather than technical and managerial capabilities.

8) Modern industries (metal workshops, carpentry) are organized to a high degree in the SCSEU. This organisation should be assisted by the government and possibly other development agencies in its efforts to organise the supply with raw materials.

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Statistical Appendix

Table 1: Manufacturing Activity in the Sudan by Size, 1981/82

| Size | Number of Establishments | | Employment | | Gross Output Value | | Value Added | |
|---|---|---|---|---|---|---|---|---|
| | Number | % | Number | % | Mill.LS | % | Mill.LS | % |
| less than 25 | 6412 | 94.9 | 39335 | 27.2 | 525.1 | 34.2 | 275.6 | 49.4 |
| 25-50 | 131 | 1.9 | 4679 | 3.2 | 66.1 | 4.3 | 12.3 | 2.2 |
| 51-100 | 79 | 1.2 | 5432 | 3.8 | 82.7 | 5.4 | 20.7 | 3.7 |
| 100 and above | 137 | 2.0 | 95057 | 65.8 | 862.2 | 56.1 | 248.7 | 44.7 |
| Total | 6759 | 100.0 | 144503 | 100.0 | 1536.1 | 100.0 | 557.3 | 100.0 |

Source: UNIDO 1986, 74

Table 2: Percentage Distribution of Categories of Activities According to Size of Units in the Sudan 1981/82

| Size of Units: | less than 25 | 25-50 | 51-100 | 101 and above |
|---|---|---|---|---|
| Sectors (according to ISIC): | | | | |
| 31 Food, Beverages & Tobacco | 79.9 | 44.3 | 44.3 | 43.3 |
| 32 Textile, Apparel, Leather | 1.2 | 14.5 | 11.4 | 25.0 |
| 33 Wood, Wood Products, Furniture | 2.7 | 4.6 | 1.3 | 1.5 |
| 34 Paper, Printing & Publishing | 1.2 | 6.1 | 2.5 | 7.2 |
| 35 Chemical, Petrol.& Coal Prod. | 1.1 | 16.8 | 21.5 | 7.2 |
| 36 Non-Metal Minerals | 1.1 | 2.3 | 5.1 | 4.3 |
| 37 Basic Metal Industries | 0.1 | 3.1 | 2.5 | 1.3 |
| 38 Fabricated Metal Prod.& Machin. | 12.8 | 8.3 | 11.4 | 10.2 |

Source: UNIDO 1986, 75

Table 3: Distribution of Small Industry Enterprises on Categories of Activity 1981/82 (exclusive of bakeries and grain mills)

| Sectors (ISIC) | Number | % | Gross Output (LS 000) | % | Employment | % |
|---|---|---|---|---|---|---|
| 31 | 686 | 35.0 | 190133 | 66.4 | 6105 | 31.9 |
| 32 | 77 | 3.9 | 11864 | 4.1 | 984 | 5.1 |
| 33 | 173 | 8.9 | 8369 | 2.9 | 1467 | 7.7 |
| 34 | 77 | 3.9 | 3244 | 1.1 | 769 | 4.2 |
| 35 | 69 | 3.4 | 30376 | 10.6 | 1232 | 6.4 |
| 36 | 68 | 3.4 | 7909 | 2.8 | 2059 | 10.7 |
| 37 | 4 | 0.02 | 159 | 0.05 | 64 | 0.3 |
| 38 | 820 | 41.5 | 34223 | 12.0 | 6451 | 33.7 |
| Total | 1974 | 100 | 286277 | 100 | 19185 | 100 |

Source: Sen 1985, 30

Table 4: Regional Distribution of Handicraft Units 1970/71

| Region | No.of Units | %of Total | No.of Workers | %of Total | Value of Production | %of Total |
|---|---|---|---|---|---|---|
| Khartoum | 2736 | 14.33 | 9084 | 24.93 | 8998 | 41.45 |
| Blue Nile | 4928 | 25.90 | 8948 | 24.55 | 5290 | 24.37 |
| Kassala | 2347 | 12.34 | 4126 | 11.32 | 2204 | 10.15 |
| Kordofan | 5980 | 31.44 | 8388 | 23.02 | 2524 | 11.63 |
| Northern | 1206 | 6.35 | 2954 | 8.11 | 1703 | 7.84 |
| Darfur | 1825 | 9.64 | 2941 | 8.07 | 990 | 4.56 |
| all Northern Regions | 19022 | 100 | 36441 | 100 | 21709 | 100 |

Source: Dept. of Statistics 1974

Table 5: Distribution of Handicraft Units by Branch (1970/71)

| Branch | Total No. | % | of these: Khartoum | % | Total No. of Workers | % | Total Value of Production | % |
|---|---|---|---|---|---|---|---|---|
| Food Prod. | 1189 | 6.25 | 184 | 6.72 | 6243 | 17.13 | 8965 | 41.30 |
| Drinks | 2792 | 14.68 | 164 | 5.99 | 3737 | 10.26 | 897 | 4.13 |
| Clothes | 9308 | 48.93 | 1532 | 55.99 | 13096 | 35.94 | 4053 | 18.67 |
| Furniture | 941 | 4.95 | 88 | 3.22 | 11946 | 5.34 | 1337 | 6.16 |
| Leather, Plastic, Tannery | 1232 | 6.48 | 56 | 2.05 | 2220 | 6.09 | 915 | 4.21 |
| Ornaments & Blacksmith P. | 1733 | 9.11 | 168 | 6.14 | 3466 | 8.51 | 2457 | 11.32 |
| Palm Leaves Products | 670 | 3.52 | 8 | 0.29 | 716 | 1.96 | 53 | 0.25 |
| Pottery | 465 | 2.44 | 180 | 6.58 | 3669 | 10.07 | 626 | 2.88 |
| Tobacco | 540 | 2.73 | 320 | 11.70 | 716 | 1.96 | 431 | 1.99 |
| Unclassified | 172 | 0.91 | 36 | 1.32 | 632 | 1.74 | 1975 | 9.10 |
| Total | 19022 | 100 | 2736 | 100 | 36441 | 100 | 21709 | 100 |

Source: Dept. of Statistics 1974

Table 6: Industrial Survey Nyala 1987/88

| Industries: | Dec.1987/Jan.1988 establishments | Workers | August 1989 establishments | workers |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| 1.decortication | 11 | 302 | - | - |
| 2.oil press:traditional | 3 | 3 | - | - |
| 3. modern | 8 | 372 | 6 | 269 |
| 4.grain mill | 86 | 258 (1) | 86 (1) | 258 (1) |
| 5.bakery | 97 | 403 (1) | 97 (1) | 403 (1) |
| 6.sweets factory | 1 | 48 | - | - |
| 7.traditional sweets | | | | |
| 8.soft drinks and ice | 1 | 31 | 1 | 33 |
| 9.snuff factory | 1 | 11 | - | - |
| 10.textile | 1 | 195 | 1 | 195 |
| 11.tailors | 328 (1) | 348 (1) | 239 (1) | 242 (1) |
| 12.tannery | 6 | 120 | 24 | 24 |
| 13.leather work | 147 | 254 | 72 | 115 |
| 14.of this:shoe repair | 13 | 14 | 19 | 19 |
| 15.carpentry | 168 (1) | 546 (1) | 131 (1) | 442 (1) |
| 16.printing | 2 | 20 | 2 | 25 |
| 17.soap | 1 | 31 | - | - |
| 18.gum and plastic prod. | 43 | 79 | 24 | 45 |
| 19.tyre repair | 5 | 16 | 4 | 14 |
| 20.pottery | | | | |
| 21.bricks | | | | |
| metal work | | | | |
| 22.modern workshops | 66 | 335 | 69 | 298 |
| 23.only car repair | 89 | 485 | 71 | 373 |
| 24.blacksmiths | 69 (1) | 183 (1) | 58 (1) | 131 (1) |
| 25.tinsmiths | 21 | 55 | 21 | 39 |
| 26.goldsmiths | 9 | 43 | 9 | 43 |
| 27.foundries | 9 (1) | 39 (1) | 3 | 18 |
| 28.bicycle repair | 11 | 21 | 15 | 27 |
| 29.watch repair | 22 | 28 | 24 | 24 |
| 30.repair electric mach. | 2 | 8 | 3 | 5 |
| 31.radio and tv repair | 30 | 59 | 24 | 34 |
| 32.car electricity | 11 | 52 | 3 | 14 |
| 33.painting and dyeing | 11 | 40 | 3 | 6 |
| 34.palm leaves products | | | | |
| 35.mattress | 10 | 30 | 2 | 5 |

36.building

Table 7: Industrial Survey Nyala 1987/88, classified by areas

| | Light Industr.Area | | | | Heavy Industr.Area | | | | Suq al Kabir | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| industry | (1) | (2) | (3) | (4) | (1) | (2) | (3) | (4) | (1) | (2) | (3) | (4) |
| 1. | - | - | - | - | 11 | 302 | - | - | - | - | - | - |
| 2. | - | - | - | - | - | - | - | - | - | - | - | - |
| 3. | - | - | - | - | 8 | 372 | 6 | 269 | - | - | - | - |
| 4. | 1 | 3 | 1 | 3 | - | - | - | - | 1 | 3 | 1 | 3 |
| 5. | 2 | 23 | 2 | 23 | - | - | - | - | - | - | - | - |
| 6. | - | - | - | - | 1 | 48 | - | - | - | - | - | - |
| 7. | - | - | - | - | - | - | - | - | - | - | - | - |
| 8. | 1 | 31 | 1 | 33 | - | - | - | - | - | - | - | - |
| 9. | - | - | - | - | 1 | 11 | - | - | - | - | - | - |
| 10. | - | - | - | - | - | - | - | - | - | - | - | - |
| 11. | - | - | - | - | - | - | - | - | 33 | 48 | 23 | 26 |
| 12. | - | - | - | - | - | - | - | - | - | - | - | - |
| 13. | - | - | - | - | - | - | - | - | 1 | 3 | 1 | 1 |
| 14. | - | - | - | - | - | - | - | - | - | - | 1 | 1 |
| 15. | 19 | 112 | 12 | 95 | - | - | - | - | 1 | 3 | 1 | 3 |
| 16. | - | - | - | - | - | - | - | - | 1 | 7 | 1 | 5 |
| 17. | - | - | - | - | 1 | 31 | - | - | - | - | - | - |
| 18. | - | - | - | - | 1 | 20 | 1 | 16 | 13 | 14 | 13 | 14 |
| 19. | - | - | - | - | - | - | - | - | 3 | 9 | 3 | 9 |
| 20. | - | - | - | - | - | - | - | - | - | - | - | - |
| 21. | - | - | - | - | - | - | - | - | - | - | - | - |
| 22. | 65 | 331 | 68 | 294 | - | - | - | - | - | - | - | - |
| 23. | 88 | 483 | 71 | 373 | - | - | - | - | - | - | - | - |
| 24. | 6 | 17 | 4 | 9 | - | - | - | - | 3 | 5 | 1 | 2 |
| 25. | - | - | - | - | - | - | - | - | 1 | 1 | - | - |
| 26. | - | - | - | - | - | - | - | - | 2 | 18 | 2 | 18 |
| 27. | - | - | - | - | - | - | - | - | - | - | - | - |
| 28. | - | - | - | - | - | - | - | - | 5 | 10 | 5 | 10 |
| 29. | - | - | - | - | - | - | - | - | 7 | 11 | 9 | 9 |
| 30. | - | - | - | - | - | - | - | - | 2 | 8 | 2 | 4 |
| 31. | - | - | - | - | - | - | - | - | 7 | 16 | 1 | 2 |
| 32. | 11 | 52 | 3 | 14 | - | - | - | - | - | - | - | - |
| 33. | 8 | 34 | 1 | 2 | - | - | - | - | - | - | - | - |
| 34. | - | - | - | - | - | - | - | - | - | - | - | - |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 35. | – | – | – | – | – | – | – | – | 9 | 26 | 3 | 10 |

| | Suq Umm Dafaso | | | | Other Markets | | | | Residential Areas | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Industry | (1) | (2) | (3) | (4) | (1) | (2) | (3) | (4) | (1) | (2) | (3) | (4) |
| 1. | – | – | – | – | – | – | – | – | – | – | – | – |
| 2. | – | – | – | – | – | – | – | – | 3 | 3 | – | – |
| 3. | – | – | – | – | – | – | – | – | – | – | – | – |
| 4. | – | – | – | – | – | – | – | – | 84 | 252 (1) | 84 (1) | 252 (1) |
| 5. | – | – | – | – | – | – | – | – | 95 | 380 (1) | 95 (1) | 380 (1) |
| 6. | – | – | – | – | – | – | – | – | – | – | – | – |
| 7. | – | – | – | – | – | – | – | – | | | | |
| 8. | – | – | – | – | – | – | – | – | – | – | – | – |
| 9. | – | – | – | – | – | – | – | – | – | – | – | – |
| 10. | – | – | – | – | – | – | – | – | – | – | – | – |
| 11. | 263 | 268 | 157 | 157 | 44 | 44 | 59 | 59 | | | | |
| 12. | – | – | – | – | – | – | – | – | 6 | 120 | 24 | 24 |
| 13. | 133 | 234 | 65 | 108 | 13 | 17 | 6 | 6 | | | | |
| 14. | 9 | 10 | 12 | 12 | 4 | 4 | 6 | 6 | | | | |
| 15. | 11 | 22 | 10 | 20 | 7 | 19 | 8 | 24 | 130 (1) | 390 (1) | 100 (1) | 300 (1) |
| 16. | – | – | – | – | – | – | – | – | 1 | 13 | 1 | 20 |
| 17. | – | – | – | – | – | – | – | – | – | – | – | – |
| 18. | 28 | 42 | 10 | 15 | 1 | 3 | – | – | | | | |
| 19. | 1 | 5 | 1 | 5 | 1 | 2 | – | – | | | | |
| 20. | – | – | – | – | – | – | – | – | | | | |
| 21. | – | – | – | – | – | – | – | – | | | | |
| 22. | – | – | – | – | – | – | – | – | 1 | 4 | 1 | 4 |
| 23. | – | – | – | – | 1 | 2 | – | – | – | – | – | – |
| 24. | – | – | 7 | 14 | 45 | 130 | 43 | 86 | 15 (1) | 30 (1) | 10 (1) | 20 (1) |
| 25. | 6 | 28 | 6 | 18 | 14 | 26 | 15 | 21 | | | | |
| 26. | 7 | 25 | 7 | 25 | – | – | – | – | – | – | – | – |
| 27. | – | – | – | – | – | – | – | – | 9 (1) | 39 (1) | 3 | 6 |
| 28. | 1 | 2 | 4 | 7 | 5 | 9 | 6 | 10 | | | | |
| 29. | 14 | 17 | 15 | 15 | 1 | 1 | – | – | | | | |
| 30. | – | – | – | – | – | – | 1 | 1 | | | | |
| 31. | 20 | 39 | 18 | 27 | 3 | 4 | 5 | 5 | | | | |
| 32. | – | – | – | – | – | – | – | – | | | | |
| 33. | 2 | 4 | 2 | 4 | 1 | 2 | – | – | | | | |
| 34. | | | | | | | | | | | | |
| 35. | 1 | 4 | 1 | 3 | – | – | 1 | 1 | | | | |

Table 8.Distribution of case studies in Nyala

| industry | No.of case studies |
|---|---|
| 12.tannery | 2 |
| 13.leather work | 3 |
| 15.carpentry | 26 |
| 18.gum and plastic pr. | 2 |
| metal work | |
| 22.modern workshops | 23 |
| 23.only car repair | 11 |
| 24.blacksmiths | 13 |
| 25.tinsmiths | 11 |
| 26.goldsmiths | 3 |
| 27.foundries | 2 |
| 33.painting & dyeing | 1 |

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