# MODERN EVOLUTION OF MANUFACTURING IN LIBYA

**By**

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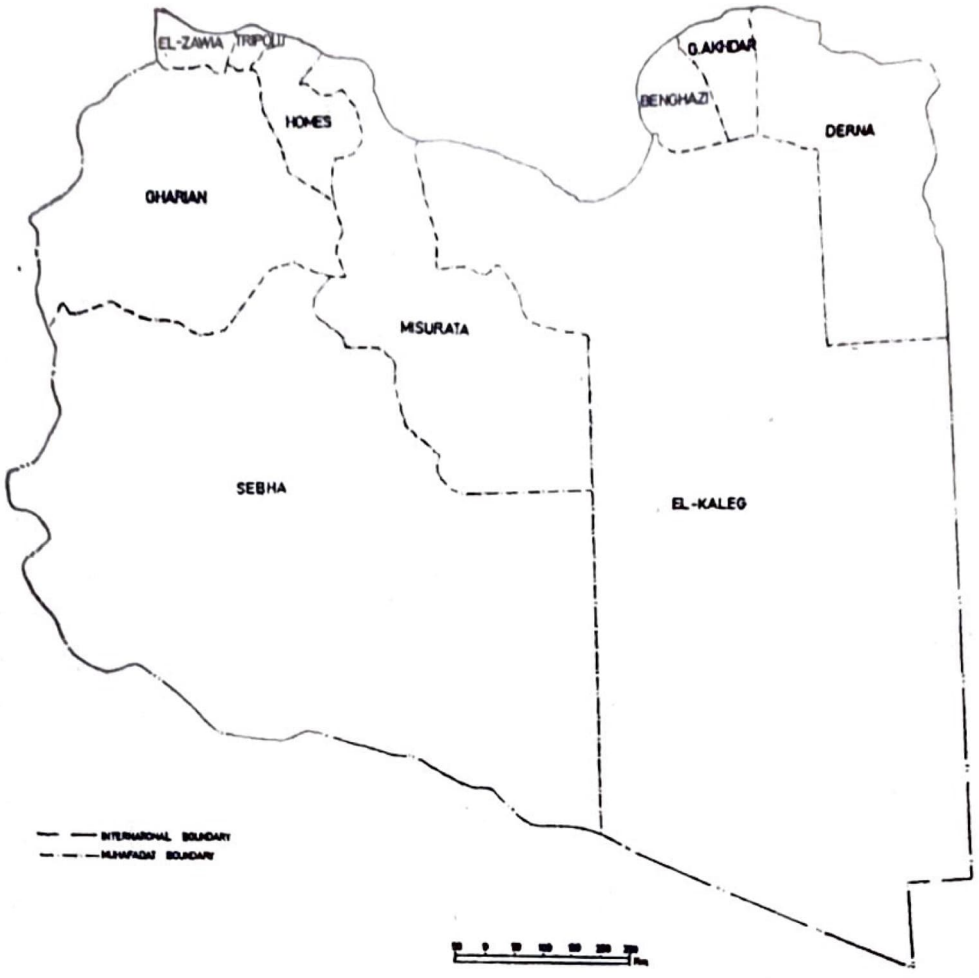
## Modern Evolution of Manufacturing in Libya

During the period 1964-1971, the years between the two most recent Libyan Census of Manufacturing Industries, various industries in Libya experienced phenomenal changes relating to location and growth. During these seven years the overall increase in total persons engaged in industry was about 7489 workers, 81.1 per cent of the 1964 number. An important growth has been made by Libyan industry in the past decade, with the application of the social and economic development plans as well as the introduction of the loan system. But, did every industrial group and industrial region expand at this rate of growth, or did some have a different rate ? If so, which regions had the fastest rate, and which had the slowest ? Which industrial groups had a rapid growth rate and which had a declining one ? Moreover, was the rate of growth and decline of these industrial groups the same or different in each of the regions ? The purpose of this paper is to answer these questions and to identify and contrast the types of change in industrial location and growth which took place in the country during this period.

Industrial change will be discussed in terms of the number of workers and establishments throughout the industrial groups and various regions.

Before discussing the changes, it is worth noting that the information given by the 1964 Census concerns the major regions (Muhafadat) not the subregions. Besides, the Muhafadat boundaries were changed in 1971 (Figure 1). Two points, therefore, should be kept in mind : 1) the comparative study of the changes will mainly

Figure .1. New Administrative Muhafadat in LIBYA 1971



concentrate on the major regions (Muhafadat), and 2) since the most southern regions are not important in terms of manufacturing industries, and since most changes in the regional boundaries were in the south, a slight modification must be made to make the study more suitable and clear. The Ubari and Sebha Muhafadat of 1964 will be considered as one Muhafada in the 1964 figures. The new El-Kaleg Muhafada will be excluded from the study, since it did not show any industrial significance, but its omission will not effect the study.

## I — Industrial Change in terms of Establishment And Workers :

### A — Change in Industrial Groups

The industry or region which grew the most between the two dates did not necessarily grow the fastest, because there is a difference between the amount of growth and the rate of growth. Amount is measured in terms of increased numbers, while rate is measured in terms of percentage. Therefore, this study will consider both aspects of growth. A comparison of changes throughout the industrial groups between 1964 and 1971 is shown in Table 1. In spite of the fact that there is a net increase of 7,489 workers during this period with about 81 per cent general growth, it is quite obvious that the change is uneven. Certain industries gained more workers, while others showed a decline. But the growth and decline are not at the same rate. The growth and decline in any industry can be attributed to the economic growth and social welfare. The rapid improvement in the standard of living of the population and social changes which occurred during this period had a major direct and indirect influence on the growth and decline of industries.

As far as the rate of growth is concerned, it can be seen from the table in both cases that four of the groups grew at a rate greater than the national average. These were the food, leather, wood and metal-work groups. Two groups (building materials and miscellaneous) in terms of number of employment, and building

***Table 1.* Change in number of industrial employees and establishment among major industrial groups, 1964-1971**

| | Industrial group | Employment | | | | Establishments | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1964 | 1971 | Net total employment shift | % of shift | 1964 | 1971 | Net total establishment shift | % of shift |
| I. | Food, soft drinks and tobacco | 3235 | 8159 | +4914 | +151.9 | 142 | 364 | +222 | +156.3 |
| II. | Textiles | 565 | 503 | — 62 | — 11.0 | 19 | 17 | — 2 | — 10.5 |
| III. | Leather, shoes and clothes | 134 | 308 | + 174 | +129.9 | 8 | 16 | + 8 | +100.0 |
| IV. | Paper and printing | 773 | 543 | — 230 | — 29.8 | 21 | 33 | + 12 | + 57.1 |
| V. | Wood and furniture | 551 | 2013 | +1462 | +265.3 | 63 | 201 | +138 | +219.0 |
| VI. | Chemicals | 1718 | 1010 | — 708 | — 41.2 | 141 | 39 | —102 | — 71.8 |
| VII. | Building materials and non-metallic | 1877 | 3198 | +1321 | + 70.4 | 92 | 153 | + 61 | + 66.3 |
| VIII. | Metal work* | 346 | 956 | + 610 | +176.3 | 26 | 73 | + 47 | +180.8 |
| IV. | Miscellaneous | 35 | 43 | + 8 | + 22.9 | 7 | 6 | — 1 | — 14.3 |
| | Total | 9234 | 16723 | +7489 | + 81.1 | 519 | 902 | +383 | + 73.8 |

* **Machinery and transportation repairs subtracted from this group because it was excluded from 1971 census.**

**Source :** (1) **Census and Statistical Department, Industrial Census of 1964,** Tripoli, 1965.
(2) **Computed by author from data in I.R.C., Industrial Establish ment Census 1971,** Tripoli, 1972.

materials and paper group, in terms of establishments, grow at a lower rate than average.

The wood and furniture group, especially the carpentry industry, was the fastest manufacturing group. It expanded at a rate of 262 per cent exceeding by more than three times the national rate of growth. This boom in the wood group has given it the third largest share in the industrial structure of the country. It represented about 6 per cent of the country's manufacturing workers in 1964, but by 1971 this proportion had increased to about 12 per cent, Table 2.

**Table 2. Industrial Structure of Libya in terms of employments in 1964-1971**

| Industries | % of the 1964 | % of the 1971 |
|---|---|---|
| Food, soft drinks and tobacco | 35.0 | 48.73 |
| Textiles | 6.1 | 4.25 |
| Leather, shoes and clothes | 1.5 | 0.60 |
| Paper and printing | 8.4 | 3.24 |
| Wood and furniture | 6.0 | 12.04 |
| Chemicals | 18.6 | 6.04 |
| Building materials and non-metallic | 20.3 | 19.06 |
| Metal work | 3.7 | 5.72 |
| Miscellaneous | .4 | 0.32 |
| | 100.00 | 100.00 |

As mentioned above, the boom of new projects for building and construction was due to the change of living standards involving new types of building, furniture, as well as the demand for modern decorations.

The public sector had a remarkable expansion in terms of building and construction in the last decade. During the 1963-1969 Development plan, about LD. 480 millions were spent for this sector including about 450 large projects, and 15,000 residential dwelling units, besides other projects constructed in developing

the cities of Beda and El-Marg. Between 1969 and 1973 the number of construction and building projects was even more remarkable, about 51,681 residential dwelling units were constructed in various regions in the country.

Figures which are available show that the private sector witnessed the same expansion. In Tripoli the total built up area was increased from 73,416m$^2$ in 1956 to about 105,182m$^2$ in 1968[1*] Most of the demand for doors, windows, decorations and furnitures for these units was from local industry. Furthermore, local production was cheaper than foreign production, due to the ease of importing materials, such as wood. Carpentry is one of the simplest industries, which does not require a high capital investment. It is also characterized by industrial workers requiring only a limited education and training. The fact that the total imports of articles produced from wood declined after 1967, (Figure 2), indicates that the remarkable growth for this group occurred after that date.

Some of the reasons mentioned previously, besides the increased demand for agricultural tools, modern housing tools, and furniture, also explain the rapid growth of the metal working.

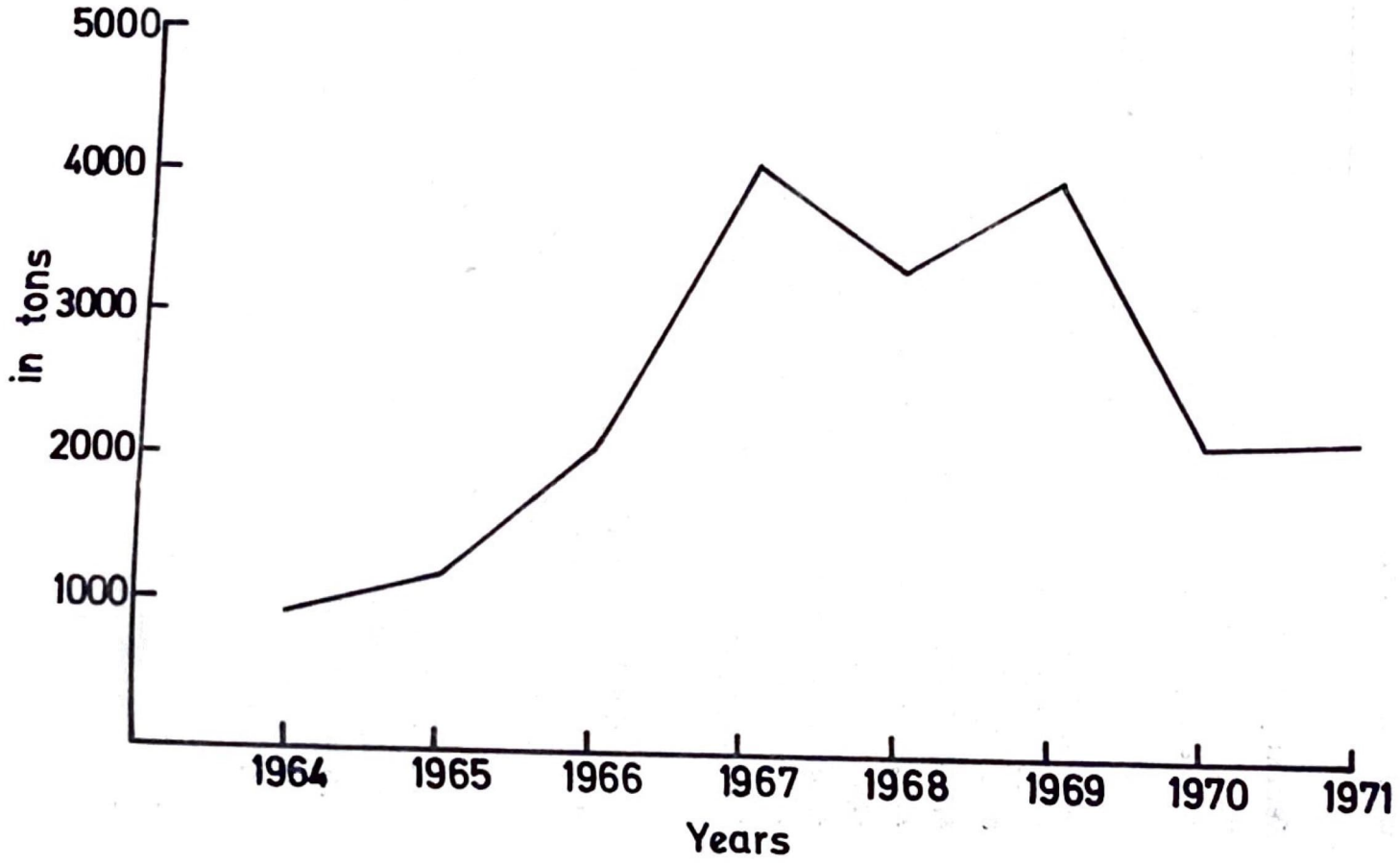
The food, soft drinks and tobacco group rank third, with 152 per cent about twice the national rate of growth. The actual increase rate for this group would have been 158 per cent, but for the closure of four establishments which produced wine, beer and alcohol. They were discontinued for religious reasons as Muslims are forbidden to drink or sell alcohol. In 1970 these four establishments employed 180 workers and produced more than six million litres of these different drinks. This industry in general is labour intensive and is not heavily dependent on highly skilled workers.

Although the leather, shoe and clothes group showed a relatively rapid growth as a whole, the leather industry was stable, and the shoe industry declined, while clothes has a high rate of growth : 208 workers, 67.5 per cent of the group's workers joined the clothes

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* This area excludes the total area which was completed without permission from the Municipality.

Figure. 2. Imported Wood Articles 1964-1971



industry after 1964. The decline in the shoe industry was mainly due to lack of protection as well as to foreign competition*. One result was the failure of the Mara Shoes Factory in Benghazi and its closure in 1965.

As far as decline is concerned, it has been shown that three industrial groups experienced a substantial decline during this period. This decline would be more dramatic if one assumed that these groups achieved the lowest growth rate, which is 22.9 per cent in Miscellaneous group. Thus if each of these groups had achieved the national industrial employments growth rate, there would have been an increase of about 457 workers in textiles, 626 workers in paper and printing, 1392 workers in chemicals. Therefore each group's comparative loss in relation to the lowest growth rate is abcut 192,407, and, 1001 worker respectively.

In terms of decline, three groups of industries witnessed a decline in numbers of workers, while only two groups declined in case of the number of establishments if we excluded miscellaneous groups.

The chemicals group, which is one of the declining industries, shows a sharper decline in the number of establishments than in the number of workers. This may be because new establishments tend to be larger and more capital intensive. Because small establishments cannot compete with the new, modern ones, and they fail to continue in operation. It is also because some establishments are affected by foreign competition. This applies especially to cheap articles from Japan, such as batteries, plastic and rubber items. Good examples, are the failures of the Nasr Battery Factory and the Plastic Shoes Factory, both in Benghazi.

Although the paper and printing group experienced nearly a one-third decrease in number of workers, the number of establishments increased by more than the half during this period. This may

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* The Industrial Census of 1971 published in 1973 estimated the average price of the leather shoes produced locally at LD. 1.400 and the imported by LD. 1.470.

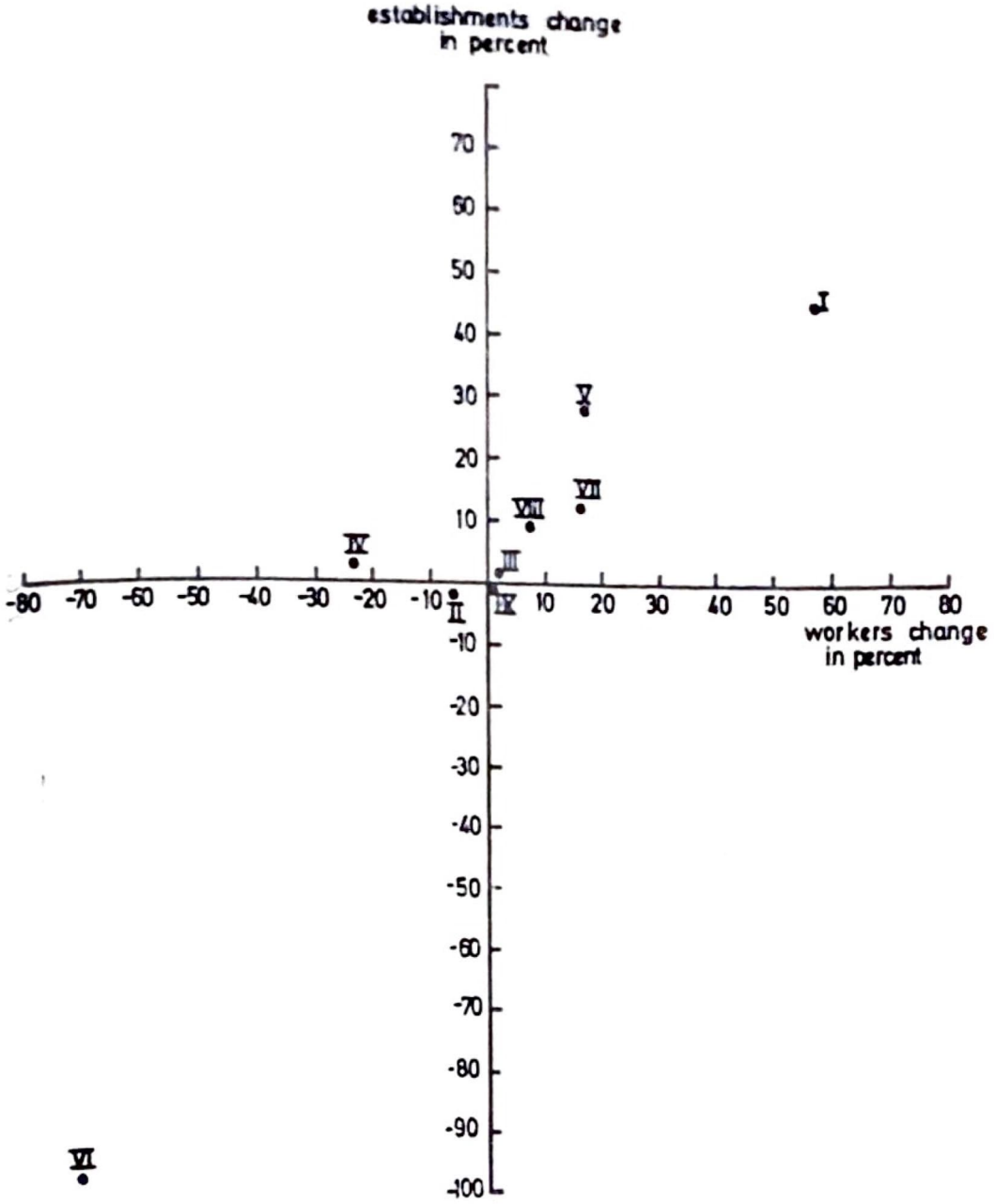



Figure. 3. Percentage of National Net Establishments and Workers Change by Industrial groups 1964-1967

be attributed to a gradual decrease in the size of each establishment, and growth of new small ones, combined with a change in operational techniques too become more capital intensive. The expansion of commercial centres may have encouraged the large establishments to set up new small branches, since the printing industry is considered market oriented.

The textile industry was one of the old and common industries in Libya, and the change from old traditional establishments to new modern capital intensive ones might be the main explanation for the decrease in the number of workers and establishments in this group of industry. Although the percentage of national net establishments and workers change by industrial groups over this period, Figure 3. It is clear that six of the nine groups are clustered within a fairly narrow range of percentage change, between — 6.2 to 17.2 per cent in the case of worker and between — 2 to 28.2 per cent in the case of establishment changes. In order to clarify the percentage changes for these industrial groups in terms of change in establishments and workers, four industrial groupings may be made :-

1 — Groups which experienced growth in both establishments and workers.

A — Food, soft drinks and tobacco (I)

B — Wood and furniture (V)

C — Building materials and non-metallic (VII)

D — Metal work (VIII)

E — Leather, shoes and clothes (III)

2 — Groups which experienced growth in workers and decline in establishments.

A — Miscellaneous (IX)

3 — Group which experienced decline in workers and growth in establishments.

A — Paper and printing (IV)

4 — Group which experienced decline in both workers and establishments.

A — Chemicals (VI)

B — Textile (II)

**B — Changes in size of establishments**

Because of the absence of figures on the proportion of workers in each category in the industrial census of 1964, the study of the changes in the size of establishments in this period will be based on the distribution pattern of establishments classified by three categories. Although it provides limited interest, it is obvious from Table 3 that there was a varied rate of proportional growth among categories. The large and small categories show higher rate of growth than the average rate, with a slightly greater proportional increase in the case of large categories. Medium sized establishments show a slow growth. However, keeping in mind the fact that 1964 census included 103 establishments dealing with machinery and transportation, while 1971 census does not include that, and most of them small in size. So if one subtract them, it can be deduced that the proportional growth of the small category is more greater.

The growth in the large category in this period may be due to the setting up of new government establishments such as Cement Factory in Homes, and Furniture Factory in Tripoli. In addition, the private sector, making available to them unlimited loans. The substantial changes which occurred may also be because some establishments began to take the advantage of economics of scale. However, the proportional number of workers for the large category in 1971 has been reckoned at 46.9 per cent and for the small category as 36.9 per cent of the total number. In addition, the 1971 Census showed that 11 of the establishments which employ more than one hundred workers were set up after 1964. Accordingly one can imagine that most of the expansion in the number of workers during this period in the large category.

**Table 3. Change of number of Industrial Establishments by size in Libya, 1964-1971**

| Size of Establishment | 1964 | 1971 | Net Total of shift | % of Total shift |
|---|---|---|---|---|
| 5 — 19 | 508 | 749 | +241 | 47.4 |
| 20 — 49 | 77 | 98 | + 21 | 27.3 |
| More than 50 | 37 | 55 | + 18 | 48.6 |
| Total | 622 | 902 | +280 | 45.0 |

**Source :** (1) Census and Statistical Dept., **Industrial Census of 1964,** Tripoli 1965.

(2) Computed by Author from data in I.R.C. **Industrial Establishments 1971,** Tripoli 1972.

It is probable that a high proportion of the new small establishments occurred in the food, drinks and tobacco and wood and furniture groups. This is because both of these increased in number of establishments yet the former shows a decline in the average number of workers in 1971 per establishment. The number declined from about 23 per establishment in 1964 to about 22 in 1971, while the latter still has the lowest average per establishment. In these groups, usually, small establishments are able to remain in operation, because many have some workers who are unpaid members of the family, or because they serve small local markets (e.g. bakers, dairies, and ice cream merchants), or operate as subcontractors.

This type of establishment may have an effect on the economy of the country, because they operate in an inefficient manner and are traditionally organized. Therefore a large number of establishments with a low industrial potential should be consolidated.

### C — Changes in ownership

Table 4, reveals that during the period under study industry's sole proprietorship recorded the higher increase accounting for about 94 per cent, while the co-operative companies decreased sharply. State-owned and joint-stock companies had a slight in-

crease. Keeping in mind that the co-operative and joint-stock companies are mainly considered as private, because of most of the partners are individual traders, it means the private sector still shows a greater increase than the public one. In addition, some of these public establishments were shifted to government control due to the departure of the Americans and the Italians, such as the Milk Factory at Auguba Pase, (Mellaha Pase). However this trend in the private sector can be explained by the industrial development policy before 1970*.

**Table 4. Changes in the ownership of industrial establishment 1964-1971**

| Ownership type | No. of establishment 1964 | 1971 | No. of establishment shift | % |
|---|---|---|---|---|
| Sole Proprietorship | 367 | 710 | 343 | 93.5 |
| Co-operative company | 188 | 123 | —65 | —34.6 |
| Joint-stock company | 49 | 52 | 3 | 6.1 |
| State-owned | 10 | 17 | 7 | 70.0 |
| Unknown | 8 | — | — 8 | 1.0 |
| Total | 622 | 902 | 280 | 45 |

**Source** : (1) Census and Statistical Dept., **Industrial Census of 1964,** Tripoli 1965.

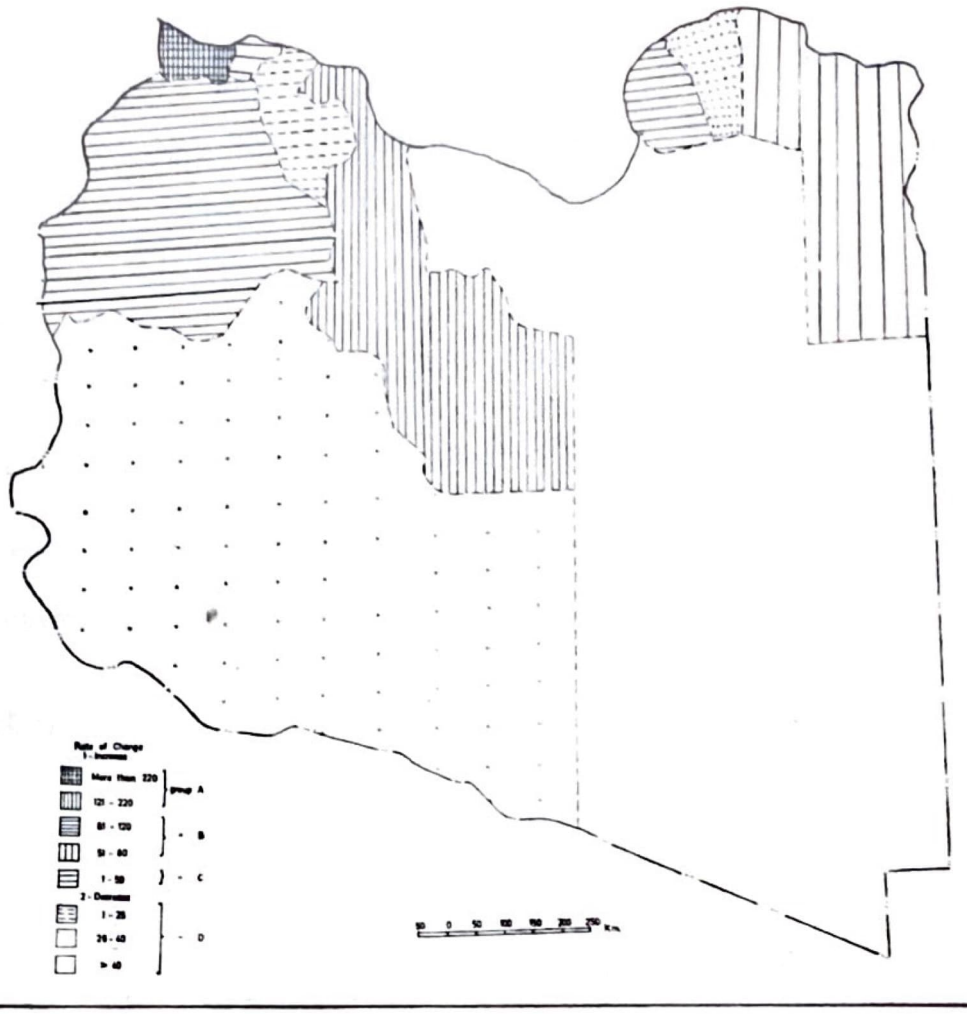
(2) Computed by the author from data in I.R.C. **Industrial Establishments census 1971**, Tripoli 1972.

**D — Changes in Regional Patterns**

As has been pointed out in the previous section, the various industrial groups in Libya had different rates of change from 1964-71. The different regions can also be expected to show varied types

* See El-Mehdawi M. Industrial Geography of Libya : Study in Location and Structure. Paper submitted to the first Geographical Conference, in Libya, March 1974.

Figure. 6. The relative growth of industrial workers among the Muhafadat 1964 - 1971



of change. In terms of absolute number of workers, Table 5 reveals that six regions show an increase, while three regions decreased in the number of workers. The industrial regions which grew the most were Tripoli, Benghazi and El-Zawia Muhafadat. These were the only regions to gain more than 950 workers. Furthermore, these regions contributed a total growth of 5187 workers, or about 92 per cent of the nation's total growth.

**Table 5. Growth of industry in Libya 1964-1971 among the regions**

| Region | 1964 | | 1971 | | |
|---|---|---|---|---|---|
| | No. of workers | Rank | No. of workers | Rank | Net shift in number |
| Tripoli | 7378 | 1 | 9985 | 1 | 2607 |
| Benghazi | 1850 | 2 | 3462 | 2 | 1612 |
| El-Zawia | 298 | 4 | 1266 | 3 | 968 |
| Misurata | 230 | 6 | 718 | 4 | 488 |
| Homes | 711 | 3 | 541 | 5 | —170 |
| Derna | 238 | 5 | 397 | 6 | 159 |
| Gl. Akhdar | 135 | 8 | 92 | 9 | — 43 |
| Gharian | 81 | 9 | 159 | 7 | 78 |
| Sebha and Ubari | 185 | 7 | 103 | 8 | — 82 |
| | 11106 | — | 16723 | — | 5617 |

**Source :** (1) Census and Statistical Dept., **Industrial Census 1964,** Tripoli, 1965.

(2) Computed by the author from data in I.R.C., **Industrial Establishment census 1971,** Tripoli, 1972.

In the case of the single regions Tripoli leads with more than one and a half times Benghazi's increase, and two and a half times El-Zawia's increase. The Homes, Gebel Akhdar and Sebha regions are the regions where losses were registered. The largest loss was in Homes where the number of industrial workers decreased by 1970, followed by Sebha 82, and Gebel Akhdar 43 workers. The

location of Homes between Tripoli and Misurata regions, the migration of young people from the south, and the change of the government headquarters in 1969 from Beda, might be the important reasons for these declines. Keeping in mind the population change according to 1973 census result, it may also be suggested that there is a direct relationship between the growth of population and the growth of industrial workers in the country. The area extending from Tajora in the east to Zuara and Nalut in the west, including Tripoli, Azizia, Ben-Gashir, El-Zawia and Sebrata is the area which had the largest increase in industrial workers, about 3675, nearly two-thirds of the nation's total growth.

Furthermore, the Table 5 shows that the end of this period (1971) the pattern of distribution of industrial workers was similar to the distribution of absolute growth, especially in the first four regions. Consequently one can conclude that regions which gained the most workers were these which had the largest number of workers. However, the various changes in the regions during this period affected the order of the regions in terms of number of workers. For example, Homes lost its third place to El-Zawia. The Misurata region moved ahead to fourth place behind El-Zawia, overtaking Homes and Derna, which ranked fifth and sixth respectively in 1971.

As far as relative growth is concerned, Figure 4 emphasises four types of groups :

(a) — those which grew at a high rate,

(b) — those which grew at a moderate rate,

(c) — those which grew at a rate less than national rate,

(d) — those which lost a number of workers.

In group (a), El-Zawia is the nation's most rapidly growing industrial region, registering about 325 per cent growth in the intercensual period. This might be explained by reasons referred to above, and it might also benefit from its proximity to Tripoli. It is followed by Misurata with 212 per cent growth. The gradual build-up of state-owned factories in Zletin and Jafra provides the reason for Misurata's growth and it might also be maintained that

Figure 5 Increase in number of workers by Muhafadat in LIBYA 1964 - 1973

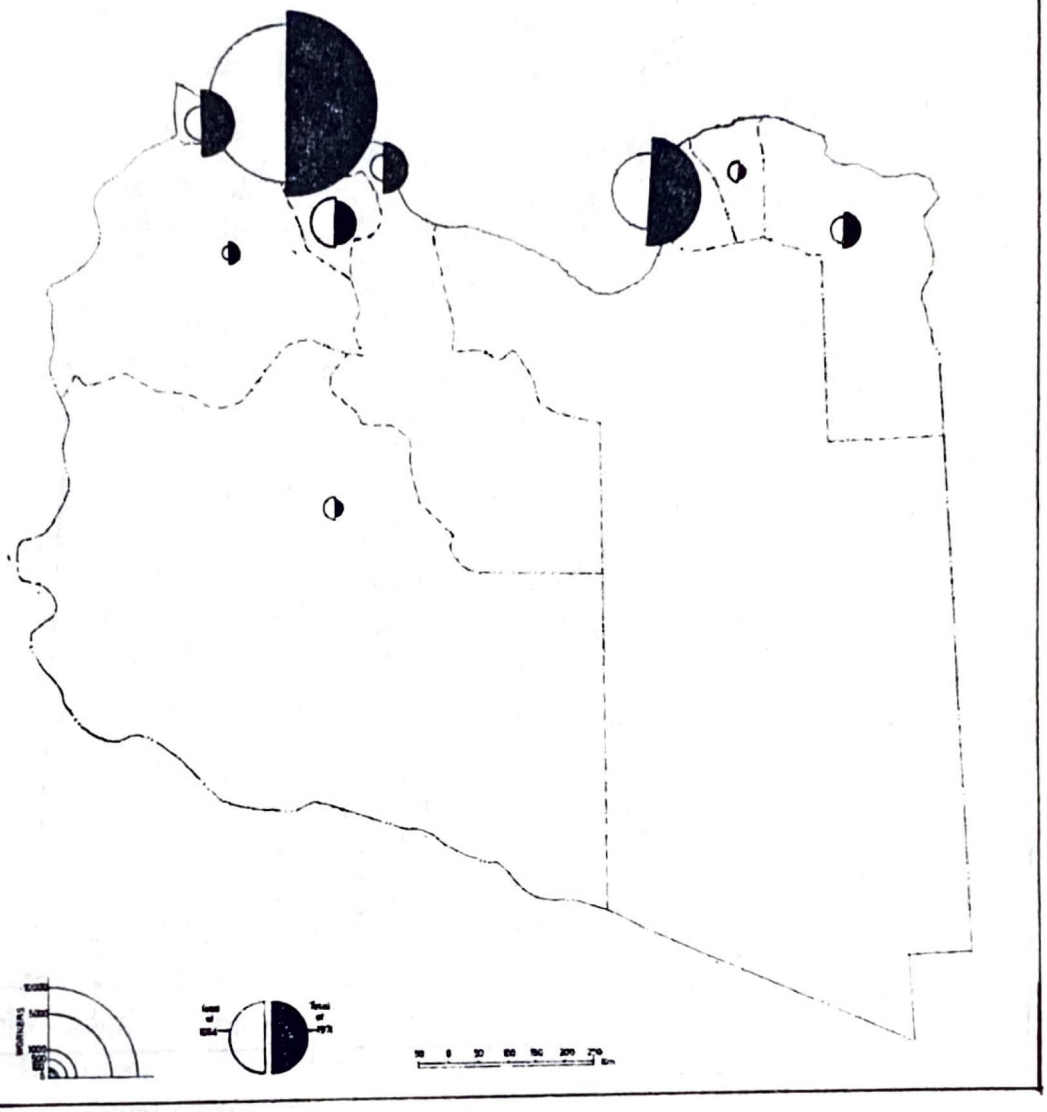
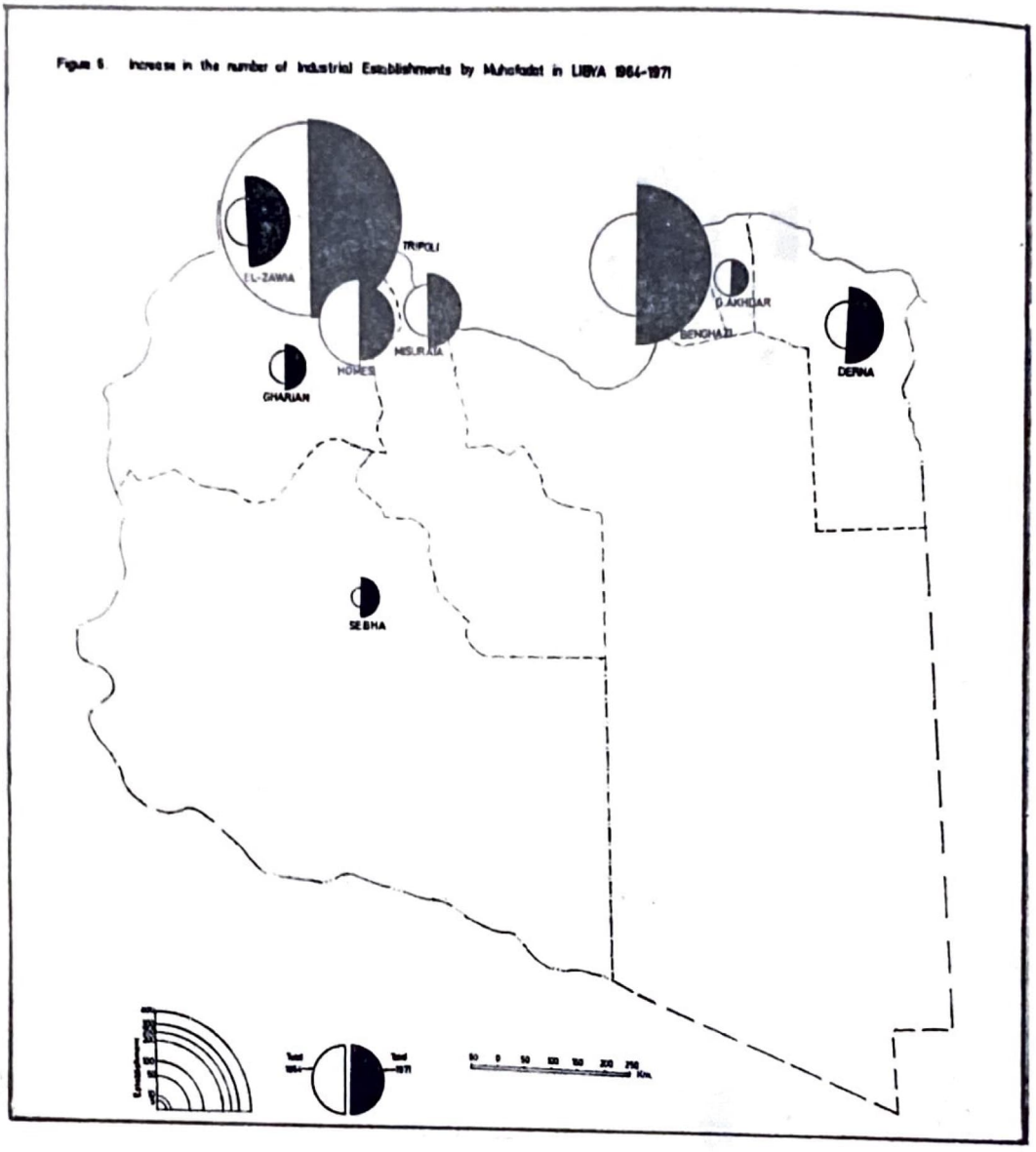


Figure 6 Increase in the number of Industrial Establishments by Muhafadat in LIBYA 1964-1971



some industrial workers were moved from Homes to Misurata. The regions which had a moderate rate of growth (b), are Benghazi, Gharian and Derna, with rates of 87,96 and 67 per cent respectively. Tripoli, with a 35 per cent of rate (c) is the only region whose growth was less than the national rate, while the last group (d), includes all the other regions. Moreover, the greatest percentage change in industrial workers during the period meant relatively small numbers of workers, as they took place in centres which had small numbers of workers in 1964. For example, the outstandingly large percentage increase in El-Zawia and Misurata represented a smaller number of workers than in Tripoli and Benghazi.

Although the industrial census of 1964 does not give the work distribution of industrial groups among the regions, and since the highest growth in numbers of workers was in the food, soft drink and tobacco group, and as Table 5 shows that the food group had a high proportion of industrial workers in 1971 in El-Zawia and Misurata, one can suppose that the rapid growth in these two regions was mainly in the food, soft drink and tobacco group.

Comparing the net change in establishment Figure 5 with net change in workers Figure 6 among the various Muhafadat, it is clear that they are not directly related, largely because of the disproportionate influence of increase large establishment in the main Muhafadat such as Tripoli and the small establishment in some regions such as Sebha. One Muhafada (Homes) recorded a decline in both terms of number of establishments and workers, and another (Gebel Akhdar) had a stable situation in terms of establishment, but a decline in terms of workers. But elsewhere, there was an increase of both terms in all Muhafadat, including Sebha and Ubari whose total workers had fallen. The figures indicate also that Tripoli Muhafada which recorded an outstandingly large increase in number of workers recorded a relatively small increase in number of establishment, while in contrast in the case of Derna Muhafada, recorded a large increase in number of establishments and a relatively small increase in number of workers. There is no doubt that the Muhafada of Tripoli was a major attraction for large establishments.

In all growth industry Tripoli, Benghazi and El-Zawia had over 92 per cent of total increase number of workers, and 80 per cent of total increase number of establishment during 1964-1971. With this in mind, the figures indicate that the government should take measures to help the development of Homes, Gebel Akhdar and Sebha regions, particularly to attract an equal share of the new employment in the growth industries, and to show the rate of growth in Tripoli and Benghazi regions. This continuous pattern of concentration of industrial growth in these two Muhafadat during the 1960's reveals that there was no action taken by the government to influence the distribution of industry before 1971.

To summarise, in Libya during the period under study, the food, soft drink and tobacco, and the wood and furniture industrial groups were the largest and the most rapid by growing industries. They boosted their share of Libyan industrial employment from about 35 per cent and 6 per cent to about 49 per cent and 12 per cent respectively. Some industries showed a rapid increase which others declined. These facts refute the projection given by Vardjan in his 1969 study of the industrial development in Libya[2], which forecast that all groups of manufacturing industries with the exception of the textile group would increase (Table 6). Even though the projections were for 1973, they still differ greatly. These incorrect projections were based on growth of demand and the standard of living and neglected other important factors such as human, social and political considerations. This reflects the difficulty in estimating industrial growth in Libya and any study dealing with this should take all these factors into consideration. Also in summary it should be emphasised that, Tripoli and Benghazi experienced the largest growth in number of workers and establishments, while El-Zawia registered the highest percentage growth. Rates of growth were more rapid in the north-western than in north-eastern parts of the country. Finally there was a higher growth in small scale industries, and most industries were in the private sector.

**Table 6. Percentage change in number of workers by industrial groups, 1964-1973, according to Vardjan's Projections.**

| Industrial group | No. of workers in 1964 | Projected No. of workers in 1973 | Net shift of workers | % of shift |
|---|---|---|---|---|
| Food, soft drinks and tobacco | 3235 | 4960 | 1725 | 53.3 |
| Textile | 565 | 1030 | 465 | 82.3 |
| Leather, shoes and clothes | 134 | 290 | 156 | 116.4 |
| Paper and printing | 733 | 1410 | 637 | 82.2 |
| Wood and furniture | 551 | 1770 | 1219 | 221.2 |
| Chemicals | 1718 | 2760 | 1042 | 60.7 |
| Building Materials and non-metallic mineral | 1877 | 4330 | 2453 | 130.6 |
| Metal work | 346 | 1260 | 914 | 264.1 |
| Miscellaneous | 35 | 50 | 15 | 42.0 |
| National Growth* | 9234 | 17860 | 8626 | 93.4 |

Source : Vardjan, U., **Manufacturing Sector : Tentative Development Programme** 1969-73, Vol. 1, Tripoli Mar. 1969, p. 33.

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* Electra Machinery and transport equipment subtracted from this group See Table 1.

## II. STRUCTURAL CHANGES

It may well be that the linking of changes in number of workers with the change in value added and with workers' wages and salaries would produce the most satisfactory indicator of all-round growth in industry, better than one depending on only one variable, such as number of workers, which may not always be useful as a barometer of growth or decline of industry. For example, an appearance of stability in any industrial group may be due to change in both number of establishments and number of workers, or an appearance of rapid change may result from growth in one establishment in an otherwise stable industrial group. Therefore, a study of change in number of workers alone does not illustrate fully the relative importance of these manufacturing groups.

This study attempts to discuss the relationship between changes in some of these variables among the various industrial groups.

Table 7, sets out the data used in this study, while Table 8 represents the relative percentage change in each of the variables under consideration. In general, despite the fact that the statistics are in current prices, some impression of the national characteristics of the industrial groups in terms of these variables can be gained from Table 8. Firstly, the manufacturing value added grew faster than any of the other variables during this period. It grew more than four times faster than the number of workers. Secondly, the wages earned increased more than the value added per worker, which means that the cost of workers increased during this period. This may be because of the degree of capital investment in some

**Table 7. Change In Value Added, Workers And Wages By Industrial Groups In Libya, 1964-1971 (in LD).**

| Industrial Groups | Value added | | No. of workers | | Value added per worker | | Wages and salaries unit | |
|---|---|---|---|---|---|---|---|---|
| | 1964 | 1971 | 1964 | 1971 | 1964 | 1971 | 1964 | 1971 |
| Food, soft drinks and tobacco | 2,571,924 | 12,718,000 | 3235 | 8,149 | 795 | 1,561 | 738,428 | 3,378,151 |
| Textiles | 266,597 | 715,266 | 565 | 503 | 472 | 1,422 | 156,655 | 356,232 |
| Leather, shoes and clothes | 35,059 | 146,997 | 134 | 308 | 262 | 477 | 27,581 | 147,084 |
| Paper and printing | 402,033 | 709,171 | 773 | 543 | 520 | 1,306 | 284,885 | 402,575 |
| Wood and furniture | 268,113 | 2,037,156 | 551 | 2,013 | 487 | 1,012 | 147,257 | 1,267,550 |
| Chemicals | 370,000 | 1,788,504 | 1,718 | 1,010 | 215 | 1,771 | 205,233 | 669,872 |
| Building materials and non-metallic | 926,744 | 3,881,184 | 1,877 | 3,198 | 494 | 1,214 | 608,926 | 2,644,451 |
| Metal work | 190,313 | 1,046,973 | 346 | 956 | 550 | 1,095 | 145,497 | 585,068 |
| Total * | 5,030,783 | 23,043,251 | 9,199 | 16,680 | 3,795 | 9,858 | 2,314,462 | 9,450,983 |
| Mean | 628,848 | 2,880,406 | 1,150 | 2,085 | 474 | 1,232 | 289,308 | 1,181,373 |

* Excludes the miscellaneous industry group.

Sources : 1. Census and Statistical Dept., **Industrial Census, 1964,** Tripoli, 1965.
2. Computed by the author from data in I.R.C. **Industrial Establishment Census 1971,** Tripoli, 1972, and **Industrial Census 1971,** Tripoli, 1975.

industries which required skilled workers with high wages, but, in addition, the workers' wages and salaries increased threefold. The basic wage increased from LD 0.500 to LD 1.500 as a result of government policy.

**Table 8. Percentage Changes In Some Variables In Libya Among The Various Industrial Groups, 1964 - 1971.**

| Industrial Group | Value added | No. of workers | % change in Value added per worker | Wages and salaires |
|---|---|---|---|---|
| Food, soft drinks and tobacco | 394.5 | 151.9 | 96.4 | 357.5 |
| Textiles | 168.3 | — 11.0 | 201.3 | 127.4 |
| Leather, shoes and clothes | 319.3 | 129.9 | 82.1 | 433.3 |
| Paper and printing | 76.4 | — 29.8 | 151.2 | 41.3 |
| Wood and furniture | 659.8 | 265.4 | 107.8 | 760.8 |
| Chemicals | 383.4 | — 41.2 | 723.7 | 226.4 |
| Building materials | 318.8 | 70.4 | 145.7 | 334.3 |
| Metal work | 450.1 | 176.3 | 98.4 | 302.1 |
| Mean | 358.0 | 81.3 | 159.9 | 308.3 |

In terms of change within the various industries, results gathered from Table 8 point to some interesting and important facts. Firstly, there is an extremely wide range of growth rates among the different industrial groups. The wood and furniture groups had the highest rate of growth of total value added, followed by metal work, and these two groups also showed the highest rate of growth in numbers of workers.

Comparing the different growth rates (by industrial groups) of workers and value added, it is obvious that in spite of reduction in the number of workers in some industries, they showed a marked increase in value added per worker; the chemical group showed a dramatic increase, more than three times that of the textile group, and ranked second. Others that showed a marked growth in

the number of workers had a growth in value added per worker less than the national rate of growth.

An analysis of value added per worker and the wage unit among the various groups indicates that the chemicals, textiles and paper and printing stand in a unique situation. These groups registered both the highest value added per worker, and the lowest growth in wages unit. Groups which had the lowest value added per worker registered the highest growth of wages unit. The change of wages unit in the wood and furniture group is more than three times that of the chemical group, and more than 18 times that of the paper and printing group. A comparison of these variables reveals several facts. Firstly, the chemicals, textiles and paper and printing groups recorded the highest productivity per worker and, secondly, since the number of workers decreased in these groups, and they achieved the lowest rate of growth in the wage unit, one can presume there was a capital-intensive trend in these groups during the period under consideration. Meanwhile, the food, soft drink and tobacco, leather, shoes and clothes, wood and furniture and metal work groups, with a high change in the number of workers, wage and salaries unit, and a low change in value added per worker, were still mainly labour-intensive, using the traditional system of operation and equipment.

In order to obtain further insight into industrial growth, and the difference between the patterns of growth in this period, it is advisable to apply some form of correlation analysis to these industrial variables. The results of these correlations are summarized in Table 9. It is clear from this table that in the case of the changes in value added and in numbers of workers, there is a positive correlation during the period. Those industries where value added increased more than average tended to achieve higher than average change in number of workers, except for the chemical group where the number of workers decreased. In contrast, industries with less than average increase in value added gained less than an average increase in number of workers.

Turning to the change in value added per worker and in number of workers, the table indicates that the correlation is ne-

gative, and this is significant (at 0.05). It means that the industries with an above-average increase in value added per worker tended to have a lower than average increase in the number of workers.

**Table 9. Matrix Correlation Of Change In Some Variables In Industry In Libya, 1964-1971.**

| Variables | Value added | Workers | Value added per worker | Wages and salaries |
|---|---|---|---|---|
| Value added | — | 0.762 | — 0.429 | 0.690 |
| Workers | 0.762 | — | — 0.738 | 0.762 |
| Value added per worker | — 0.429 | — 0.738 | — | — 0.714 |
| Wages and salaries unit | 0.690 | 0.762 | — 0.714 | — |

This result tallies with the relation between the change in value added per worker and wages unit. The correlation is statistically insignificant, but most of the industries which increased above the average in value added per worker tended to achieve the least rate of change in wages unit. It is clear that new production techniques were introduced for some industries, and it agrees with the previous results affecting industries such as chemicals, textiles and paper. But the benefits from technical progress were varied, the chemical group recording more benefit than other industries.

So during this period those industries which achieved above average increase in value added per worker experienced below average increase in workers and in wages and salaris. On the other hand, industries which achieved a small increase in value added per worker tended to show that their workers and wages increased more than the average growth.

To conclude, it can be seen that an expansion and growth of industry was evident in Tripoli and Benghazi. They were the only areas which recorded a substantial increase in industrial workers, because they are in a good position to attract new industrial con-

cerns with good growth prospects. The rapid growth of industry in these two Muhafadat may shed light on the concentration problem and the future of regional planning. The chemical industry was the most successful industry during these years, and in spite of the decrease in its number of workers, it achieved the highest growth in productivity. The wood and furniture, metal work and food, soft drinks and tobacco groups, achieved a great increase in terms of workers, but a low rate in productivity per worker. These industries are still carried on in small-scale establishments with a traditional system. Moreover, in spite of general industrial growth, Libya's industrial growth was still slow during this period as a result of poor industrial policies. Finally, it seems that large establishments have grown rapidly in recent years, and this may be expected to continue in any future period of accelerated growth.

**References**

1 — Attiga, A. **The impact of the oil on the Libyan Economy, 1956-1969**, Beirut, Lebanon, 1972, p. 177.

2 — Vardjan, V. Manufacturing Sector : Tentative Development Programme 1964-73, Vol. 1, 1969, p. 33.