INDUSTRIALISATION AND ENVIRONMENT IN ETHIOPIA

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INTRODUCTION

The establishment of modern manufacturing in Ethiopia dates back to the emergence of a strong central government and the political stability that came with it towards the end of the 19th century. The rapid increase in the number of establishments in the period before 1950 was not the result of a conscious and deliberate industrial development policy and strategy. In fact, the period before the Second World War was considered as the "dark ages" of conservation, for the concepts of economic development as well as those of conservation were not known in Ethiopia at government level.

After 1950, a deliberate strategy to encourage the expansion of the industrial sector was formulated. The period between 1957 – 1974 was the time when the government made significant efforts to modernise and to bring about rapid economic development. As regards conservation, since the period was growth oriented, it was dominated by the view that natural resources should serve the purposes and objectives of economic growth and must be exploited as much as possible. The view was that since there were plenty of natural resources, there was no need to worry about their being depleted. Thus, one can not really discuss policies, legislation and other institutions pertaining to natural resources management of this period.

Following the Stockholm conference on Environment in 1972, environmental concerns within Ethiopia seem to have received more attention. The environmental issues were in the main agriculture related: i.e. soil erosion; decline in soil futility; forest and woodland deterioration; insects and animal pests and human diseases like malaria, schistosomiasis, etc. Industrial pollution was considered to be the least, not critical in Ethiopia for industrialisation has not yet advanced to the point where air pollution or industrial wastes in water have become a problem.

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The main sources of hazardous wastes among the enterprises according to the survey of the chemical society of Ethiopia are believed to be the food, beverages, tobacco, textile, leather tanning and finishing, paper and paper products, chemicals, and sugar industries.

The acceleration of the rate of industrialisation as part of the overall development strategy of the country, i.e., agriculture development led industrialisation (ADLI) justifies that industry related pollution would become an important component of environmental problem. Unless mitigating actions are taken, the industrial pollutants could cause irreversible damage to the atmosphere, vegetation, and the quality of water.

Generally, there is lack of literature that provides a comprehensive survey of industrialisation and environment in Ethiopia. The purpose of this paper is, therefore, to fill this gap in literature; to describe industrial wastes; to examine efforts made to manage industrial wastes as well as to present alternative approaches to pollution control.

To achieve the above mentioned objectives, multiple sources of data and information are used including government documents, recent World Bank, UNIDO, UNEP, etc study reports and the 1998 Oromia Region industrial survey and report. In addition, further references to some surveys conducted by individuals are made.

SURVEY OF INDUSTRIALISATION POLICIES AND ENVIRONMENT IN ETHIOPIA

Global concerns

In Africa in general and Ethiopia in particular the thinking on environmental issues in 1970s was agriculture related: i.e., soil erosion; decline in soil fertility; forest and woodland deterioration; insects and animal pests; and human diseases like malaria, shistosomiasis, yellow fever, and gastro intestinal diseases which impair food crop production (Program for International Development 1980: 77 – 82). Industrial pollution was considered to be the least, not critical in Africa for industrialisation has not yet advanced to the point where air pollution or industrial wastes in water have become a problem.

However, recent research reports indicate that by 2020 developing countries will account for 40 percent of global commercial energy consumption (increasing to 60 percent by the middle of the next century). Although energy services are essential for industrialisation

and improving economic growth as well as living standards, its excessive generation and consumption causes serious threat to the atmosphere. The world energy council estimates that by 2020, developing countries will have overtaken the industrialised countries as the primary emitters of atmospheric pollutants. Energy use also contributes to anthropogenic emissions of green house gases and associated climate change (UNIDO 1997: 8).

Although industry lags behind agriculture as a user of water (20 percent and 69 percent respectively), it is the most rapidly growing sector in developing countries leading to fast diminishing of the quality and quantity of water. World chemical industry sales during the early 1990s exceeded one trillion US dollars a year, of this, one–third came from non–industrialized countries (UNIDO 1997: 17). A major share of the world toxic and hazardous waste is produced by chemical and allied industries such as pesticides, pulp and paper, leather and metallurgical industries.

Finally, this part of the paper dealt with, among other things, the causes of ozone layer depletion, loss of bio-diversity and global warming as well as the consequences thereof and the suggested measures undertaken globally. It concluded by providing the reflection that human communities not only need goals related to their economic performance but also moral and spiritual goals. Care for the overall health of the planet is such a goal. If demands action by scientists to provide better information about likely climate change, by governments to set the necessary frameworks for change, by business and industry to seize the opportunities for innovation and introduction of new clean technologies and by all world citizens to support the action being taken and contribute to it.

Local Concerns

The establishment of modern manufacturing in Ethiopia dates back to the emergence of a strong central government and the political stability that came with it towards the end of the 19th century. Factors that contributed towards its development include: the installation of the Ethio–Djibouti railways; the strengthening of Ethiopian foreign relations (which is depicted by increased settlement of foreigners from Armenia, Greece, Italy and India which also brought the entrepreneurial capacity to develop manufacturing industries locally); the corollary change in the pattern of consumption (i.e., food habits, clothing, drinking, furnishing, construction, etc.) of the urban nationals; and the increasing problem associated with transporting and cost of imported commodities like

wood, clay and printing products (Befekadu Degefe and Berhanu Nega 1999/2000: 202; Teferi Regassa 1994: 48).

The manufacturing sector in Ethiopia increased rather rapidly in post war period (1941–1950) partly because of the close relationship between the Ethiopian government and the United States and the United Kingdom (Befekadu Degefe and Berhanu Nega 1999: 202).

The rapid increase in the number of establishments in the period before 1950 was not the result of a conscious and deliberate industrial development policy and strategy. In fact, the pre-second world war period was considered as the "dark ages" of conservation, for the concepts of economic development as well as those of conservation were not known in Ethiopia at government level (Shibru Tedla and Kifle Lemma 1996).

It was only after 1950 that a deliberate strategy to encourage the expansion of the industrial sector was formulated. The "statement of policy for the encouragement of foreign capital investment in Ethiopia" was the important legal notice (Legal Notice number 10 of 1950) in this regard. A decree to provide for the encouragement of capital investment in Ethiopia (Decree number 51 of 1963), the revised investment proclamation of 1964, agricultural and industrial expansion (proclamation number 242 of 1966) were the important initiatives and refinements for the expansion of modern industries in Ethiopia. Moreover, Ethiopia started to develop five-year plans to guide its economic policy. Three successive five-year plans were formulated and implemented during the imperial era and a fourth five-year plan was under preparation on the eve of the February 1974 revolution (Befekadu Degefe and Berhanu Nega 1999).

The period between 1957 – 1974 was the time when the government made significant efforts to modernise the country and to bring about rapid economic development. As regards conservation, since the period was growth oriented, it was dominated by the view that natural resources should serve the purposes and objectives of economic growth and must be exploited as much as possible. This view did not emphasise the need to wisely manage natural resources in order to ensure that the rate of exploitation did not exceed the rate of regeneration. Rather, view was that since there were plenty of natural resources, there was no need to worry about their being depleted. Thus, one can not really discuss policies, legislation and other institutions pertaining to natural resources management of this period (Shibru Tedla and Kifle Lemma 1996). The belief that there were plenty of natural resources is reflected in the First Five-Year Plan (1957 to 1961).

Up to 1980, the industrialisation policy focused on import substitution, with employment creation and growth maximisation objectives. Concern with the appropriateness of

industrial technology transfer has usually been explained in terms of the degree of its "labour intensiveness." Even after 1980, industrialisation has been expected of employment generation, skill creation, foreign exchange conservation, backward and forward linkage effects and stimulating regional development (Girma Zewdie 1983).

In 1950, there were about 107 plants (Girma Zewdie 1983), and this figure was raised to 430 in 1975/76 (Befekadu Degefe and Berhanu Nega 1999: 207). But in 1980 the figure declined to 416 (Girma Zewdie 1983) and further declined to 402 in 1985/86 as well as to 273 in 1992/93, the lowest ever registered. Eventually, the number of manufacturing plants was raised to 642 in 1995/96 (Befekadu Degefe and Berhanu Nega 1999) and currently the figure is well over 650 dominated by 150 public enterprises. In 1995/96 public enterprises accounted for by 95 percent of the sectors value added (Abebe Shimelis 1996).

All the pre-1970 government actions were in the main focused on how to use the abundant natural resources of the country for productive purposes, i.e., to increase production and productivity, but failed to accommodate environmental concerns. Following the Stockholm Conference on Environment in 1972, environmental concerns within Ethiopia seem to receive more attention.

Since the conscious beginning of industrialisation in Ethiopia (in 1950s), industrial technologies were transferred without giving due consideration to industrial waste disposal techniques. Although the situation in the country is not as it is nowadays in developed countries, it is to be noted that several types of industrial wastes (airborne effluents, liquid effluents, and solid wastes) are generated in the industries and discharged into the environment. The main sources of hazardous wastes among the enterprises according to the survey of the chemical society of Ethiopia are believed to be the food, beverages, tobacco, textile, leather tanning and finishing, paper and paper products, chemicals, and sugar industries.

According to information from the Chemical Society of Ethiopia, since the beginning of 1997, a programme called "National Capacity Development for Cleaner Industrial Projects of Ethiopia – NACDPE" has been at work in order to: design and implement training modules and techniques of industrial waste auditing; create the requisite skilled manpower for executing waste auditing exercises in industries; and improve economic profitability and environmental soundness of the existing industries in the public and private sectors. The programme is administered by the Chemical Society of Ethiopia and

the Ethiopian Private Industries Association, financed by Heinrich Boll Foundation of Germany.

The Federal Democratic Republic of Ethiopia has economic programme that is a rural centred development program with utmost emphasis on the agriculture sector. The strategy is named Agricultural Development Led Industrialisation (ADLI). While this strategy is being implemented, a separate industrial policy is being prepared. As the experiences of the now developed countries attest, there can not exist an overall economic development without some kind of industrialisation. According to unofficial documents, the forthcoming policy is hoped to establish and strengthen institutions necessary to promote industrialisation, create a conducive environment for industrial development, promote inter–and intra–sectoral linkages, create an appropriate financial environment, encourage balanced regional industrial development, and promote industrial exports (FDRE 1996: 36; Befekadu Degefe and Berhanu Nega 1999: 237 – 238).

The Federal Environmental Policy of Ethiopia was issued in 1997. Environmental activities are too many (of immediate, medium and long-term nature) and require the involvement of too many institutions. For example, in relation to industry related environmental pollution over 20 activities such as industrial waste, hazardous materials, etc., involving more than 12 institutions such as Ministry of Trade & Industry, Ministry of Health, Ministry of Agriculture, Ministry of Labour and Social Affairs, Ministry of Water Resources, City Council, Regional Council, Regional Bureaux of Industry, Agriculture etc, Customs Office, Science and Technology, etc., (Environmental Protection Authority 1998: 36 - 44). Thus, before the issuance of the new industrial development policy of Ethiopia, it would be important to check its consistency with the overall development policy strategy (ADLI) and the 1997 Federal Environmental Policy.

INDUSTRIAL DISCHARGES IN ETHIOPIA

Description of Survey Results

The description in this part heavily draws upon the data obtained from questionnaires filled by nine manufacturing establishments in 1998 as part of the general study of the industrial situation in Oromia region. The factories surveyed include edible oil, tannery, flourmill, aluminium sulphate, brewery and ceramic minerals.

Factories cause various types of pollution. Except the tannery and ceramic mineral plants, which have not answered this question, the rest have reported that, save noise, they cause air, water and solid waste pollution.

Most (56%) of the surveyed plants reported that they have awareness that their plants are involved in chemicals which can be considered as hazardous toxic when discharged to the environment. The hazardous toxic chemicals as listed by the plants are caustic soda, hexavalent chrome and sulphate, acid mist, sodium sulphate, lime and sulphuric acid. Other hazardous toxic chemicals include xylene (from Alkyd Resin factory), waxes and greases, fragments of fabric, hypochlorite hydrogen peroxide, various dyes, sodium chloride, pigments, etc., (from yarn factories).

Water is required by the plants for different purposes including potable, cooling, processing and washing. Over half of the surveyed plants have reported that they did not have a pre-treatment plant for water and some of them do not have the architectural layout of water feed and drainage system.

The majority (66%) of the plants' source of solid wastes is processing. The sources of air pollution by plants indicate that the major air pollutant is stinking smells (67% of the responses), followed by dust particles (33%).

Points of Special Attention in Relation to Industrial Waste Management

- Lack of knowledge, i.e., not to be well aware of the extent of the plants' wastes and pollution or the absence of measured value for them and the human suffering caused thereof as well as both social and economic costs imposed by ill-health.
- It is identified that suggested technical measures by plants to minimise pollution differ from plant to plant as production processed (styles) differ from plant to plant.
- Measures undertaken to attain the goal of occupational safety and health care are not sufficient because the techniques are merely imported (transplanted) from industrial countries, which are with little relevance to the local condition of the country. Thus, suggesting that care has to be taken in implementing imported safety techniques or attempt should be made to identify if there are any traditional safety techniques practised by local community to develop them for application.
- The absence of pre-treatment plants and the architectural layout of water feed and drainage system with some of operating plants is a clear portrait of serious limitations of licenses issuing authority and investment code.
- The above points serve as the theoretical framework for the government to formulate social policy which takes into account, among other things, the externalities of industrial establishment, particularly those of diseconomies to permit those disadvantaged to compensate in one form or another. The drive to promote investment in Ethiopia should not cloud the important issue of investment externalities.

EFFORTS MADE TO MANAGE INDUSTRIAL WASTES

A programme called "National Capacity Development for cleaner Industrial Project of Ethiopia-NACDPE is being carried out since the beginning of 1997. The programme is administered by the Chemical Society of Ethiopia and the Ethiopian Private Industries Association. Heinrich Boll Foundation of Germany finances it.

The major objectives of the project are:

- Design and implement training modules and techniques of industrial waste auditing,
- Create the requisite skilled manpower for executing waste auditing exercise in industries in the public and private sectors.

A total of 38 Ethiopian industries have participated in the awareness creating training programme in the years 1997 and 1998.

ALTERNATIVE APPROACHES TO POLLUTION CONTROL

Four alternative approaches have been identified i.e.

Regulatory instruments used in both developed and developing countries are:

- Standards: environmental targets such as environmental quality standard, emission standard, technology based standard, performance standard, process standard;
- Permits and licenses;

Economic instruments: Most instruments operate as incentives to polluters. Such instruments consist of:

- The polluter–pays principle: the polluter pays financial penalty for higher levels of pollution and pays smaller penalty or receives financial reward for lower levels of pollution.
- The user–pays principle: the user of a resource pays the full social cost of supplying the resource.

The principal economic instruments used in both developed and developing countries are:

- Pollution charges: which include effluent and emission charges, user charges, product charges, administrative charges and tax differentiation,
- Enforcement incentives: consisting of non-compliance fees, performance bonds, and liability assignment.

Cleaner Production: This is a new concept started in the USA and recently promoted by UNEP/UNIDO in developed and developing countries. It focuses on tapping the generation of waste right from the source instead of an end-of-pipeline treatment. National centres for cleaner production (NCCP) have been established in various countries including Tanzania and Zimbabwe in Africa.

The concept of cleaner production has been introduced in Ethiopia since 1997.

Environmental Impact Assessment (EIA): This is a process that examines the environmental consequence of development actions in advance. It can provide a framework for considering location, design and environmental issues in parallel. It can be an aid to the formulation of development actions, indicating areas where the project can be modified to minimise or eliminate altogether the adverse impacts on the environment.

POLICY ISSUES AND STRATEGIES

Ethiopia is confronted with two basic complementary measures in its policy approaches to industrial wastes, i.e., to institute regulatory organs at the regional level (which can be applicable to both existing as well as new establishments) and to further strengthen the Regional Investment Promotion Bureaux the following strategies should be implemented:

- Undertake monitoring, training and research on industrial emission, effluents and solid wastes.
- Apply "Cleaner Industrial Production Program." Some five of the strategies for carrying out cleaner production programmes suggested in the text are: related to cleaners production regional policies, legislation and strategies; assessments for those major polluting enterprises in the country; integration into overall business

management and into environmental impact assessment and procedures of issuing permits; and the application of polluter-and-user pays principles.

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