ACCOUNTABILITY FOR HEALTH IN DEVELOPMENT

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ACCOUNTABILITY FOR HEALTH IN DEVELOPMENT

1. THE SCOPE OF THE STUDY

Introduction

The project on health accountability is designed to develop the capacity of countries to

(a) identify systematically the health hazards arising out of development activities in all important health-related sectors;

(b) identify the agencies responsible for the generation and activation of the hazards at various stages;

(c) design and establish the necessary institutions and systems which will ensure responsibility and accountability for the identification of the hazards and the necessary prevention control and other remedial measures, through appropriate co-ordination between the development Ministries and the Ministry responsible for health services;

(b) monitor the processes leading to the generation of their hazards and their activation.

The project deals with the critical conditions of health insecurity arising out of the lack of accountability for the health impact of a wide range of socio-economic activities and development processes. With the expansion of social and economic opportunity and rapid technological change new health risks are being generated in various sectors and the opportunities and choices leading to ill-health, injury, violence and disaster are increasing. In regard to many of these changes there is no system or systems for continuous identification and surveillance of these health risks and for timely interventions to deal with them. The accountability for these health impacts is often non-existent and access to knowledge and information on the health implications of choices is poor. In most developing countries this is a grey area in health policy and management; economic and other development objectives are pursued without due concern for their impact on the health of the people. The area of health insecurity dealt with in this project lies in the periphery of the conventionally organised preventive and curative health care services. The project examines how the existing health care system and system of health accountability could incorporate these elements and provide for a more comprehensive system for the surveillance and care of the health of the population. This means that accountability for health in the areas that are discussed must be linked to the main system for quality assurance and efficiency in the delivery of services in preventive and curative care. The latter includes efficiency and quality
of health care in the government and private health sector, the ethics of health care and professional practice, the legal framework governing neglect and malpractice. The study assumes that a system of accountability exists in this area. However, in most developing countries including Sri Lanka which has been selected as the case study for the project, this main system needs further development and strengthening. The problems and issues in this area would have to be the subject of a separate study.

Objectives, Scope and Methodology

The present study has been undertaken as the first phase of the project. It attempts to develop the methodology for designing an appropriate system of health accountability for the health risks that are identified. For this purpose it has selected the Sri Lankan case and developed the main elements of a system which could be used as a frame of reference for developing the national systems for other developing countries with suitable adaptations.

Although Sri Lanka falls into the category of low income developing countries with a per capita income of approximately USS 640, the exceptionally high health indicators it has achieved in terms of life expectancy and low infant and maternal mortality reflects a system of health accountability which on the whole operates effectively. In most developing countries at Sri Lanka’s income levels or even with higher per capita incomes, the major problems are still those of high infant and child mortality and the heavy loss of life and morbidity resulting from the communicable and parasitic diseases commonly prevalent in poorer countries. The pathogens in these conditions of disease are micro-biological. The areas of health accountability that are discussed in the study deal with many conditions in which the pathogens are micro-chemical in origin and are emanating from human activities which change the environment in which people live, the nature of their occupations and the quality of their food and their choice of life styles. While the responsibilities of public health systems have focused effectively on the former which are micro-biological in character and brought them within the purview of environmental sanitation and control of vectors, the preventive and control systems have not developed adequately to deal with the pathogenic causes and outcomes of chemical agents arising out of human activities and changes in technology. Although for many of the developing countries it is the former which is still at the centre of their health concerns, the health problems resulting from the latter changes, such as those arising from the use of agro-chemicals in agriculture, industrial pollution, food adulteration, lack of quality controls in the supply and distribution of pharmaceuticals, expansion of modern transport, foreign travel and tourism are growing in magnitude. If timely action is not taken to install the systems which identify these problems and deal with them effectively, the health burden they will impose in addition to that already borne by developing countries will become increasingly unmanageable within their limited resources.
In the case of Sri Lanka as probably in many other developing countries, systems of accountability have evolved in some segments of the areas referred to above. For example systems are in place in occupational health, control of food and assurance of quality in food, and pharmaceuticals. Even in these however many gaps remain both in the system of surveillance and monitoring as well as in enforcement and implementation. The legal instruments are often lacking or not adequate to ensure observance of standards. Another critical deficiency in the prevailing systems is that each of these areas whether they be food, occupational health or pharmaceuticals operates for the most part as a separate activity and is not perceived and assessed as a part of a larger system of accountability for the health of the population. This may not be a serious lack if each of these systems had a high degree of internal efficiency which made them highly accountable for the health of the population in their own specific area. However, as the studies show this is not the case. The internal efficiency itself appears to depend on whether the area comes under a system of national surveillance. The priority accorded to the area, the resources allocated to it to perform its task, the identification of the emerging areas of health vulnerability depend to a great degree on the way in which the specific component comes under such surveillance. This in turn means that the health accountability in any given area has to be co-ordinated with all the other important areas of health accountability and become a well articulated component in a national system of accountability for health. The study is an attempt to identify the main elements of such a system.

Within the Sri Lankan situation the study follows the following sequence:

- It selects several sectors where new health risks are being generated and where systems are as yet non-existent or, where they exist, require substantial strengthening.

- It then identifies the main health risks associated with the sectoral activities.

- It next proceeds to identify and designate the cluster of agencies that could be held responsible for the surveillance and monitoring of the health implications and risks of these activities.

- It defines the basic elements that are needed for any effective system of health accountability. These will include the system for collecting regular information, the system for monitoring and evaluation, the legislative and regulatory framework, the machinery for enforcement and implementation, the health information and knowledge to the general public and relevant target groups and the research support for investigating new health risks and conditions of illhealth.
Finally it examines how each such cluster could be organised and linked together within a larger system that is able to monitor the relevant processes generating health risks, maintain a regular health watch at intersectoral and national levels and take timely action for prevention and control. For this the study provides illustrative institutional frameworks for each sectoral area with a monitoring mechanism at the national level.

For the Sri Lankan case study and model the following components of health accountability have been selected:

(i) Health accountability in the industrial sector

(ii) Health accountability in the agricultural and food sector

(iii) Health accountability in the tourism sector

(iv) Health accountability in the transport sector

(v) Pharmaceuticals

(vi) Accountability for the supply of the relevant health information and knowledge to the public and appropriate target groups

(vii) The health impact of macro-economic policies

The components listed from (i) - (v) are sectoral studies. In each sector, the health hazards arising out of ongoing activities as well as future trends are identified and listed. Some of the examples in industry would be health effects of industrial pollution and risk of injury, accident and occupational ill-health and their increasing incidence with the introduction of new technologies, production processes and equipment; in agriculture they would be the health impacts of fertilisers and pesticides and the occupational health risks of agriculture: in transport, pollution and accidents; in tourism the transmission of STD/ HIV-AIDS and the effects of coastal and marine pollution. These are a few examples of the health risks which are not dealt with at their origin but are allowed to take effect until they become health problems which need the attention of the health curative services.

After identifying the potential health risks the studies examine the current status in regard to health accountability for each of these areas and designate the agencies which are presently responsible or should be held responsible for identification, monitoring, prevention and
management of these risks. The studies then briefly survey the legal, regulatory, institutional and other arrangements that are available as well as the existing gaps. Each study provides

- an analytical framework that could be used as a checklist of the health risks, the current status and the necessary responses and

- an organisational model for ensuring health accountability in the sector.

The study under (vi) examines the supply of health information and knowledge to the public in the context of the changes that are taking place. It assesses the availability of such knowledge at present from various sources - the public health agencies, the doctors during treatment, the NGOs, the media, publications, advertisements, labels and information provided with the products. It thereafter examines the need to improve and systematise the flow of health information and knowledge to the public and widen access to it.

The component (vii) of the study of accountability of macro-economic policies for health selects indirect taxes and tariffs, allocation of government resources and structural adjustment and stabilisation policies as the main areas which require attention and which lend themselves to some degree of health impact analysis. The present study does not attempt to go further to trace the health effects of other policies which have an impact on health through a wide range of other variables such as income, employment and inflation. Such a task which deals with the indirect impacts on health requires analytical work which is beyond the scope of the present study and in any case would be too theoretical to have adequate relevance for policy making.

The presentation that follows is a summary of the full length case studies. It extracts the main conclusions and findings of the 7 case studies to identify the main elements of health accountability in each area. The study proceeds to delineate the national system that could be developed from these components. It provides an institutional framework of health accountability in development which is depicted in an organisational chart. It has to be repeated that this component has to be linked to and co-ordinated with the other major component which covers the main health care system with its preventive and curative services.
2. ACCOUNTABILITY FOR HEALTH IN SELECTED SECTORS

(i) Health Accountability in the Industrial Sector

Introduction

The impacts of industry on human health are both direct and indirect. The direct impacts are the health hazards in industrial workplaces. These include injuries, burns and disease conditions caused by exposure of workers to toxic chemicals such as lead, manganese, mercury and arsenic. Workers exposed to intense noise in factories suffer hearing problems. Occupational overuse can lead to disorders in upper limbs of workers and different parts of the body.

Absence of adequate safety standards in factories and deficiencies in systems of maintenance and monitoring of safety have led to major disasters with heavy loss of human life and damage to health. The classic example is Bhopal. There have been instances though on a much smaller scale in Sri Lanka, where neglect of safety standards have led to serious accidents.

Industries can have health related impacts in other ways too. If industrial end products are unhygienic (food products) and machinery and electrical products do not meet safety requirements, they affect human health.

Industry also affects health through air pollution both indoor and outdoor and water pollution. Industrial pollution contributes to the pollution from other sources such as transport and power generation. The health impacts of environmental pollution have been reported in various environmental impact studies. Impact studies refer to a relationship between the increase in air pollution and the rise in respiratory diseases. Air pollution increases the incidence of emphysema and chronic bronchitis and severely worsens the symptoms of many kinds of asthma. Air pollution pushes up the frequency with which people especially children contact short-term respiratory diseases. Deaths from cardiovascular diseases particularly of old people (over 65) can increase with air pollution because breathing difficulties strains the heart. In Indian cities where leaded gasoline is used lead concentrations in human blood are reported to be higher than in Tokyo where unleaded gasoline is used (ADB 1990). In Thailand the incidence of occupational disease per 100,000 workers from lead poisoning has increased from 0.01 in 1978 to 0.10 in 1987 an increase of 29.2 per cent according to the Ministry of Public Health data for 1978 - 87. According to the same source the incidence of environmentally related occupational health cases increased from 2.00 cases per 100,000 in 1978 to 8.88 per 100,000 in 1987. Studies in China have revealed that air pollution along with smoking enhances the risks of lung cancer. A correlation study in 10 cities of Liaoning
in China links cancer death rates with industrial activity suggested that even after smoking is taken into consideration air pollution may contribute to lung cancer risk.

Water pollution increases health risks. While water demand for various uses is increasing the water quality is increasingly affected by pollution from domestic sewage and industrial effluents. Population growth and adverse impacts of development activities degrade supplies of fresh water and increase health risks. Annually more than 2 million deaths and billions of diseases are attributable to pollution, poor household hygiene and enhanced health risks caused by water scarcity (World Bank 1993). Diseases such as Diarrhea/dysentery, cholera, typhoid and intestinal worms are caused by poor sanitation, water supply and hygiene.

Heavy metals along with toxic chemicals have become one of the greatest threats to human health. They have adverse effects on human organisms even at relatively small concentrations. Their concentrations can reach dangerous levels even before being detected. The mercury pollution at Minamata Bay in Japan can be traced back to 1939 but the actual cause of the Minamata disease was established beyond doubt in 1973. Poly chlorinated Biphenyls (PCBs) have been in use for over half a century but they have been found to cause cancer, skin disease, jaundice and liver damage only recently (ADB 1990).

The health problems of the industrial sector can be broadly grouped under the following heads:

(i) Industrial pollution-water, air and noise pollution

(ii) Occupational health and safety of work places - occupational diseases, industrial accidents and disabilities and large scale accidents and disasters

(iii) Health hazards of industrial products to their users and consumers

These health problems arising from industrialisation in Sri Lanka have to be placed and examined in the context of Sri Lanka’s strategy for industrialisation. In 1977 Sri Lanka initiated a programme of economic reforms to pursue an export led growth strategy with greater emphasis on industrialisation and reliance on the private sector. Industry and services benefitted the most from the economic reform programme particularly after 1989, when the reform process accelerated. Value added in manufacturing showed an annual average growth rate of 8.8 per cent during the period 1990 - 1994 contributing about one third of the overall GDP. The share of manufacturing in GDP has increased from 14.8 per cent in 1985 to 19.7 per cent in 1994. The dynamism of the industrial sector is predicted to continue with the sector expanding at rates similar to those achieved in the recent past. Consequently the labour force in manufacturing will also continue to grow rapidly. The health and productivity of this
labour force and the protection of this labour force from the health hazards of the new working environment will demand high priority.

Since the latter part of 1950s Sri Lanka pursued an import substitution economic development strategy with greater reliance on the public sector. This strategy continued till 1977. The heavy industries were reserved for the public sector and in pursuance of this policy, several large scale industries were set up by the public sector. Most of these public sector industries were deliberately located in outstations partly to bring in benefits of industrialisation to distant regions. As a result the pollution effects of these large plants are dispersed. The private sector industries which concentrated on light industries were set up in Colombo and its suburbs to reap the benefits of economies of scale available in the capital city. This resulted in a high concentration of industries in the urban areas of the Colombo and Gampaha districts. Thus industrial pollution combined with urban pollution contributed to increase the pollution load in the urban areas in and around the Colombo city.

The pattern of industrialisation changed gradually with the economic and political reforms initiated after 1977. With the adoption of outward oriented development strategies with the liberalisation of the economy the type of industrialisation which followed reflected the country's emerging pattern of comparative advantage. Industries set up to exploit the country's low labour costs increased. This was reflected in the rapid growth of highly labour intensive industries such as garments and gems and jewellery. Capital intensive heavy metal, chemical and metal working industries are not economically feasible given the country's resource endowment and its present phase of industrialisation. The present pattern of industrialisation therefore does not include a large proportion of high pollutant industries. Nevertheless with the rapid increase of the low pollutant and medium pollutant industries the pollution load and the concomitant health problems will grow. Furthermore, government policies for the regional dispersal of industries to generate employment opportunities in rural areas and the ongoing process of decentralization of government would bring about a greater dispersal of industries in regions, thereby imposing new responsibilities on provincial and local government institutions. The existing systems to manage the environment, control industrial pollution and deal with the health problems of industrialisation would therefore need to be considerably improved and strengthened at the national, provincial and local government levels.

The Current Situation relating to Health Impacts of Industry

Industrial Pollution

In Sri Lanka the existing data base on industrial pollution is extremely limited and rudimentary, and is quite inadequate for estimating overall trends in industrial pollution. As
in other countries the availability of pollution data in the urban, transport and energy sectors appears to be better than for the industrial sector. Some preliminary studies on water pollution in some inland water bodies (such as the Bolgoda Lake and Beira Lake) are also available.

There are various estimates of the number of industrial establishments in Sri Lanka. One such estimate gives a figure of 40,000 to 60,000 (RDC 1992). In 1987 the Central Environmental Authority carried out a survey of industrial pollution covering 7610 industrial firms. The results of the survey are shown below:

<table>
<thead>
<tr>
<th>Type</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non polluting</td>
<td>3004</td>
</tr>
<tr>
<td>Low polluting</td>
<td>2415</td>
</tr>
<tr>
<td>Medium polluting</td>
<td>1900</td>
</tr>
<tr>
<td>High polluting</td>
<td>291</td>
</tr>
<tr>
<td>Total</td>
<td>7610</td>
</tr>
</tbody>
</table>

According to this survey only about 4% of the industries surveyed had a high pollution potential. The RDC study had identified over 4600 industries out of an estimated 40,000 to 60,000 establishments as requiring licensing under the Environmental Protection Licensing (EPL) programme of the Central Environmental Authority. Of these unlicensed industries 2191 were medium polluting and high polluting. The Sri Lanka National Report (1991) to the UNCED stated there are only about 200 industries which cause significant levels of pollution and that they account for 70% of all the pollution of industrial origin. It is reported that this estimate has been arrived at by taking into account the size, ownership and spatial distribution of industries.

Large scale industries including public sector projects appear to be the major polluters. Although small and medium industries (SMIs) may not be the major polluters in most industrial sub-sectors, it is often stated that they pollute more per unit of output than large firms operating in the same sector for several reasons. Firstly, low levels of managerial and employee skills and technology in SMIs lead to waste of resources, high pollution levels and greater health and safety risks to workers. Secondly, SMIs cannot reap the economies of scale associated with higher technology pollution abatement equipment. Thirdly, financial resource constraints make it difficult for SMIs to employ improved technologies or install treatment facilities. Finally, inadequate flow of information affects their awareness of both the problems and solutions. The older and small scale industries continue to face serious
problems in meeting specified standards; most important among these are textile factories, metal finishing works, distilleries, and coconut based producers.

At present water pollution appears to be the main impact of environmental pollution from industry. Urban water bodies and low lying lands have been affected by environmental pollution. Urban water bodies affected include Beira Lake, Lunawa Lagoon and Bolgoda Lake in Colombo and its suburbs, Nuwara Eliya Lake and Kandy Lake in outstations. Beira Lake in the heart of the city has virtually turned into a cess pool receiving sewage, domestic waste waters, garbage and waste from commercial establishments. It shows a high degree of eutrophication. Dying fish indicate depletion of dissolved oxygen. The Bolgoda Lake is subject to increasing environmental deterioration due to wastes from industries and households.

Although the ambient air quality is still within permissible limits it is likely to get worse with urbanisation and industrialisation. Energy consumption is the major source of air pollution. Table III shows the energy consumption in the Colombo Metropolitan area.

Table III
CMA Energy consumption 1991 (in TOE)

<table>
<thead>
<tr>
<th>Commercial and power - Per cent</th>
<th>Fuel source - Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household</td>
<td>Fuelwood 55</td>
</tr>
<tr>
<td>Industry</td>
<td>Furnace oil 16</td>
</tr>
<tr>
<td>Transport</td>
<td>Auto diesel 17</td>
</tr>
<tr>
<td>Commercial and power 0.3</td>
<td>Petrol 8</td>
</tr>
<tr>
<td></td>
<td>Kerosene 4</td>
</tr>
</tbody>
</table>

Source: Metropolitan Environmental Improvement Programme 1993.

The estimated annual emissions by sector and the percentage contributed by various sectors to the five major air pollution emissions are shown in Tables IV and V respectively.
Table IV
Estimated amount of Emissions per annum by type (Tons)

<table>
<thead>
<tr>
<th>Type of emission</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suspended particulate matter</td>
<td>2,478</td>
</tr>
<tr>
<td>Sulphur Dioxide</td>
<td>20,297</td>
</tr>
<tr>
<td>Nitrogen oxide</td>
<td>9,078</td>
</tr>
<tr>
<td>Hydro carbons</td>
<td>3,767</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>82,011</td>
</tr>
</tbody>
</table>

Source: Metropolitan Environmental Programme Colombo 1993.

Table V
Sectoral sources of Petroleum combustion emissions in the Colombo Metropolitan Area (per cent)

<table>
<thead>
<tr>
<th>Sector</th>
<th>Suspended particulate matter</th>
<th>Sulphur dioxide</th>
<th>Nitrogen oxide</th>
<th>Hydro carbons</th>
<th>Carbon monoxide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport</td>
<td>88.23</td>
<td>4.34</td>
<td>81.55</td>
<td>97.78</td>
<td>99.9</td>
</tr>
<tr>
<td>Industry</td>
<td>9.16</td>
<td>93.54</td>
<td>17.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power and commercial</td>
<td>1.6</td>
<td>&lt; .1</td>
<td>&lt; .1</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Household</td>
<td>2.55</td>
<td>&lt; .1</td>
<td>&lt; .1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Metropolitan Environmental Programme 1993.

It is seen that the transport sector is the major source of four of the five main pollution emissions. The contribution of the industrial sector as a source of atmospheric pollution is comparatively low. The industrial sector is the major emitter of sulphur dioxide. About half the sulphur dioxide emitted into the atmosphere comes from industries. Within the CMA the figure is more than 93%. The predominant air pollution problems in the CMA are caused by vehicle emissions (Susiripala H.L. 1993). These problems will be dealt with in the Transport sector study.
Toxic pollution is an area for which data and information are not readily available at present. Firstly, there is no comprehensive list of chemicals used in Sri Lanka. Secondly, there is still inadequate information on the chemical composition of chemicals used under trade names. Such total ignorance of the chemicals used could lead to major tragedies.

The Central Environmental Authority at present does sampling of a limited number of parameters such as Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Dissolved Oxygen (DO), P.H. etc. These parameters while being good indicators of pollution do not, however, show the quantity and toxicity and the respective toxic chemicals present in the effluent (Pilapitiya S.H. 1993). Unless the chemicals present in the effluent are known for certainty no action could be taken on discharge of toxic chemicals. Detailed information on chemicals used and their concentrations is essential for taking measures for treatment of waste since the treatment methods would vary depending on such vital information.

The major polluting industries on the basis of experience elsewhere in the world include fertilizer plants, refineries, pulp and paper mills, metal plating factories and the chemical metallurgical industries. The major polluting sub-sectors in terms of organic waste load (BOD) are food industries, alcohol distilleries, tanneries, pulp and paper mills, oils and fat plants and pharmaceutical plants.

Of the 482 industries identified as high polluting by the RDC study, chemical industries number 173 and timber and wood industries 157. A recent study has identified 8 industry categories using and discharging toxic chemical; textiles, paints, rubber and plastics, metal industry, petroleum foundry, dust generating industries and tanneries.

Overall, it would appear that the information currently available on industrial pollution is patchy and inadequate. Much of the data comes from specific micro studies carried out at various times and not from a regular systematised flow of information. Industrial pollution and its health problems are part of a sector which is expanding rapidly and therefore the current data should not lead to a sense of complacency. The available information is not adequate for determining the trends and identifying warning signals.

The main health impact related to industrial pollution identified at present is respiratory ailments. The diseases of the respiratory system rank fourth among the causes of hospital morbidity in 1993. The cases per 10,000 amounted to 2184.3 in 1993. These figures may include respiratory ailments caused by industrial pollution. Further, industrial pollution can aggravate respiratory ailments of other origin. Infectious and parasitic diseases and diseases of the digestive system are also leading causes of hospital morbidity. Industrial pollution of waterways could indirectly contribute to greater incidence of such diseases. Rising water
demand for various uses, the growing scarcity of water and the pollution of waterways may reduce the availability of safe water for the increasing population.

**Occupational Health**

The Annual Health Bulletin is the main source of health statistics in Sri Lanka. The bulletin does not show the occupational diseases and accidents separately. Although industrial firms are required to notify accidents to the Occupational Health Division of the Department of Labour non-compliance is high. Reporting is relatively satisfactory in large organisations and where trade unions are active. Under reporting or complete non-reporting is common among small and medium scale enterprises. Non-reporting is due partly to lack of awareness of the importance of such reporting among the employees and partly through fear of attracting government intervention. In organisations where the relationship between the employer and employee is close and friendly, employees do not opt to report such accidents on their own. Attempts to develop a comprehensive information system on occupational diseases and accidents have not been successful so far.

In 1992 there had been 26 work related fatal accidents resulting in a death toll of 33 according to Labour Department statistics. Non fatal worker related accidents in premises subject to Factories Ordinance in the same year amounted to 3417 cases. The number of working days lost from these accidents has been estimated at 433,615. This is quite a high figure and is an indicator of the unsatisfactory working conditions relating to safety in workplaces. Unlike the classification of industries in relation to their potential for environmental pollution, there is no specific classification of industry according to their potential for major accidents and disasters e.g chemical industries, industries using highly inflammable and explosive material.

Although there is serious concern about the health impacts of industrial production technology and processes, there are inadequate studies using controlled groups to establish such links on a definite basis. There are a few studies of selected industries such as graphite and wood working industries establishing the links between air pollution and respiratory ailments. All kinds of mining, quarrying, stone cutting and dressing operations in Sri Lanka cause respiratory ailments. Sri Lanka cement factories and asbestos factories cause air pollution. The dust emitted from Sri Lanka’s cement factories daily amount to 10 per cent of production and adverse effects on respiratory problems are reported. Dust from asbestos factories too lead to respiratory ailments. In addition, import of blue asbestos has been banned due to its well documented links with cancer. Sri Lanka’s cotton textile mills, gin plants, coir netting and processing industries, plywood industries and saw mills too produce organic dust which can cause respiratory ailments.
With the increasing participation of women in the labour force the gender-related aspects of occupational health require special attention. The workforce in the garment industry one of the fastest growing sectors comprises mainly of women. A study of occupational overwork disorders conducted in garment factories revealed persistent pain in shoulders, elbows and hands symptoms suggestive of lumbar tendinitis, tennis elbow, carpal tunnel syndrome and tenosynovitis of the finger (Occupational Health Division, L.D. 1993).

**Health Hazards of Industrial Products to Consumers and Users**

This sub-section deals with the industrial products other than food and pharmaceuticals that are dealt with in the relevant sections. There is little information on the current status relating to the health hazards of industrial products - both intermediate and consumer goods - and the way they affect the health of the population in Sri Lanka. The range of goods with potential hazards is vast and these hazards can affect all sections of the population - toys for children, consumer durables, detergents and other household goods for housewives, intermediate goods for workers. The authorities in Sri Lanka would normally be guided by the information available from developed countries regarding the adverse health effects of certain industrial products. There does not appear to be any agency specifically entrusted with the function of collecting all available information in this area. One product, the import of which has been banned is blue asbestos. This was after action had been taken by the developed countries.

**The Main Health-related Functions and Responsibilities in the Industrial Sector**

The main health related functions and responsibilities of the industrial sector and the agencies that either presently exercise or should exercise these functions are tabulated below.

**Industrial Pollution**

(i) Assessment and classification of Industries according to pollution levels;

(ii) Health Impact Assessment as component of the Environmental Impact Assessment (EIA) where EIAs are prescribed;

(iii) Licensing for environmental protection (EPL);

(iv) Development of Industry standards for pollution;

(v) Development of ambient pollution standards;
(vi) Monitoring of pollution levels;

(vii) Monitoring and enforcement of standards and norms at the level of the firm;

(viii) Monitoring of health impacts of industrial pollution

The principal agencies responsible are
- Central Environment Authority (CEA)
- Ministry of Health, other Ministries and Statutory Boards in charge of projects requiring EIAs,
- Associations of Industrial firms and major industrial firms
- Trade Unions
- NGOs and community based organisations

Occupational Health

(i) Assessment and determination of industrial pollution impacts on health within factory premises; health impact analysis as indicated above;

(ii) Occupational health surveillance,
  - Notification of occupational diseases and accidents by employers;
  - collection of information on occupation-related diseases and accidents from work places;
  - data on occupation-related morbidity and mortality from hospitals;

(iii) Enforcement of standards for safety and prevention of occupational diseases.

(iv) Research and investigations in occupational health.

The agencies responsible are
- Ministry of Health,
- Ministry of Labour
  - Department of Labour, Occupational Hygiene Division Medical Faculties of Universities,
- Research Institutes
- Trade Unions
- Associations of private sector firms and major firms
Health Impacts of Industrial Products on Consumers and Users

(i) Monitoring and surveillance of health impacts - Present activities cover food and drugs and are carried out by the Ministry of Health. These are dealt with in the sector on agriculture and food.

(ii) Development of standards;

(iii) Enforcement of standards and quality controls for health.

The principal agencies responsible are
Industrial Standards Bureau,
Ministry of Health,
Ministry of Commerce
Collector of Customs
Local Government bodies
Associations of private sector firms and major private sector firms
NGOs and community based organisations

The Institutional and Legal Framework

Accountability for the Health Impacts of Industrial Pollution

The health impact of industrial pollution of the environment would normally fall within the ambit of the environmental surveillance of the Ministry of Environment and the institutions which are concerned with environmental protection. The environmental impact analysis will include the health impacts. The Ministry of Environment has been developing the legal framework and institutional mechanism for environmental surveillance and protection.

The Central Environmental Authority has recently developed an Industrial Pollution Management Strategy. This strategy depends more on pollution source management and control rather than end of pipeline activities. The emphasis is on minimising the quantum of waste requiring treatment. Pollution discharge standards have been developed. These include required effluent standards and standards for gaseous pollutants. Industries have been grouped as existing and new. The existing industries have to meet these standards fully but they have been granted the concession to meet them in a phased out manner over a period of several years and obtain licences under the Environmental Protection License (EPL) scheme. The new industries have to meet the standards from the inception. The EPL which is operated by the CEA grants permits to discharge wastes according to set standards which vary
according to the industry. Industries have been classified into three categories; low, medium and high and until recently industries in all these categories had to obtain an EPL.

The scheme commenced in 1990. Only 25 per cent of the identified industries have been licensed as of September 1992. The average number of permits issued during the period October 1991 - September 1992 was 30. On this basis the issue of permits to the remaining 3,400 identified industries will take another 9 years. This time period does not include the licensing requirement of new industries. Complaints about industrial pollution and new industry license applications have increased but the EPL programme is lagging behind due to various constraints including shortages of skilled staff at the CEA. The other problems include the feasibility of CEA's pollution standards and approaches to industrial pollution priorities. In view of the large number of industries involved and the administrative burden on the CEA which has limited staff the issue of licenses for low polluting industries has been delegated to local authorities with effect from January 1994. The banking system is also involved in the environmental management programme by providing preliminary pollution classifications of potential investors and some banks now operate loan schemes for pollution abatement equipment.

The Industrial Pollution Management strategy envisages an integrated approach to industrial waste water pollution prevention and control which includes the following measures:

(a) Relocation of high pollution industries particularly those that produce toxic or hazardous waste to selected areas where appropriate effluent treatment facilities can be provided (e.g. leather tanneries and pesticide formulating plants).

(b) Establishment of new sewerage schemes in areas with a high concentration of industries to collect both household and industrial waste.

(c) Provision of a centralised waste collection scheme coupled to common waste water treatment and recovery facilities. Such common treatment and dispersal facilities provide economies of scale and allow for dilution of difficult waste water. Many industries will be relieved of investment costs of pollution control equipment and land for waste dispersal. The central treatment plants will be able to employ and train skilled personnel. The enforcement of effluent discharge standards and monitoring of progress will also be simplified. The cost of such treatment plants will be borne by the polluting industries on a per discharge unit basis. Recently the government has decided as a matter of policy to locate high polluting industries only in industrial estates with suitable infrastructure including centralised waste treatment facilities. The Sri Lanka Association of Tanners (SLAT) has agreed to build an industrial estate at Bata-ata, Hambantota for relocating tanneries in the Colombo city. The necessary
funding for setting up effluent treatment facilities at the site are to be obtained from the National Development Bank. Until industrial estates with appropriate infrastructure and effluent treatment facilities are built the siting of high and medium polluting industries during the interim period would be handled by a committee comprising officials from CEA, BOI and MID.

With the passage of the Environmental Impact Assessment (EIA) regulations in June 1993, prescribed projects are required by law to undertake EIAS. Some of the prescribed projects include large scale and/or hazardous industries such as iron and steel industries, chemical industries, petroleum industries, petroleum refineries, petrochemical manufacture, sugar, cement, paper and tanneries above a certain production capacity. All industrial estates exceeding 10 hectares are also subject to EIA. There are 15 project approving agencies which include 9 Ministries and 6 statutory bodies. Currently, a number of existing programmes (Table 87) to deal with industrial and urban pollution control are being implemented under the National Environmental Action plan 1995 - 1998. The main focus of these programmes is on the Colombo Metropolitan Area and control of pollution from existing industries.

There are several environmental pollution prevention laws. The government has the power to take measures to prevent pollution of lakes, tanks and public streams under the State Land Ordinance. Statutes pertaining to local authorities such as the Municipal Councils Ordinance, the Urban Councils Ordinance and the Pradeshiya Sabha Act have provisions empowering local authorities to control pollution. The provincial Boards of Health and urban councils have been vested with powers to control pollution under the Nuisance Ordinance. Powers for making by laws for waste disposal are vested in appropriate agencies. The Police Ordinance prohibits disposal of garbage and other offensive matter in an unhygienic manner. The Water Resources Board is vested with power to advise the government on ways and means of preventing pollution of rivers, streams and other water sources. The formulation of a national policy pertaining to disposal of sewage and industrial wastes is the responsibility of the Water Supply and Drainage Board (WSDB). The WSDB is also vested with pollution control. Although the institutional framework for pollution control already exists, inadequate commitment and enforcement appear to be a major constraint. It is also likely that these scattered provisions are not up to date and comprehensive. The National Environmental Act of 1980 has remedied this situation and the establishment of the Central Environmental Authority as the agency in overall charge of environmental issues will overcome the problems arising from a highly fragmented set up for dealing with environmental problems to a great extent. But the implementation of environmental pollution control measures would rest with scattered government agencies and success would depend on proper co-ordination among the agencies concerned. The success in evolving a proper health accountability system in the industrial sector would depend on the national environmental policy framework, the
approaches to industrial pollution control and the appropriate combination of command and control methods and economic incentives adopted.

Sri Lanka has extensive and comprehensive legislative framework for environmental protection. The implementation of such legislation however has encountered problems because the regulations, funds and infrastructure to implement and enforce them are inadequate. Pollution prevention legislation in Sri Lanka for water pollution, air pollution and mining is minimal and moderate for toxic/hazardous materials. Even when legislative provision is available, the formulation of standards and guidelines and their implementation have proved to be difficult.

Accountability for Occupational Health

Laws and regulations to protect workers in industrial establishments from physical and biological harm are in place. The Factories Ordinance No. 45 of 1942 and a number of regulations framed under the Ordinance address the problem of industrial safety and occupational health. The Ordinance seems to be inadequate to cope with technological changes in the industrial sector. The Factories Division of the Department of Labour administers the Factories Ordinance. There are five District Factory inspecting offices in Colombo, Kandy, Matara, Jaffna and Anuradhapura. A system of registration of factories with the Factories Division exists. These factories are required to notify industrial accidents to the Factories Division. Non compliance is reported to be high. Large scale firms generally show better compliance. Inadequate awareness, particularly among small and medium scale firms, fear of government intervention and reluctance to incur additional investment in industrial safety measures appear to be the reasons for inadequate compliance. Other reasons include worker reluctance to displease employers and trade union inactivity in these areas. The Factories Division also conducts training programmes on occupational safety and health for industrial establishments, trade unions, management institutes and other relevant institutions.

The Division of Occupational Hygiene of the Department of Labour conducts research on occupational health problems of workers in factories. Studies among workers using in addition a group of workers not exposed as a control group are conducted at selected workplaces. The Division undertakes occupational hygiene services at workplaces. Physical factors in the factory environment such as illumination level, sound level and thermal level are measured. Environmental air analysis is undertaken for quantitative measurement of dust levels and for selected chemicals. The Division also analyses effluent water samples and biological samples of workers exposed to various hazards. Blood and urine analysis is done for detection of heavy metal levels. Lung function tests are carried out to estimate the effects of dust on respiratory system. Audiometry is also performed to estimate the hearing level of
workers exposed to intense noise. The other services carried out by the Division includes occupational health clinics (weekly attendance 124) and education services. The main problem with all the services carried out by the Division is their coverage when compared with the number of industrial establishments involved.

The Workmen’s Compensation Act operated by the Commissioner for Workmen’s Compensation provides for payment of compensation for workers suffering permanent disabilities.

Accountability for the Health Impact of Industrial Products

The development and implementation of an effective system of health accountability covering all industrial products with potential health hazard is a very onerous task. Prevailing systems cover selected areas such as food and drugs which have the highest health risks. The coverage of a larger range of products would require more systematic application of health standards both at the point of import for foreign products and point of distribution for domestic products. The Standards Bureau establishes product standards for local products. The health requirements should be taken into account in the normal course of prescribing such standards. While this is invariably done in the case of food and drugs, the extent to which health criteria are specifically taken into account in the case of other products is uncertain.

The Focus on the Health Dimension

The National Health Policy formulated by the Presidential Task Force in 1992 reflects a clear awareness of many of the health problems of industrial pollution as well occupational health risks. It devotes subsections to both environment and workers health. On the latter it stresses the need for closer Health Ministry involvement. There is at present an environmental health section in the Health Ministry covering water supply and sanitation programme, workers’ health, food control services and inspection of imported food items and inspection and certification of exported food items. The Ministry is actively concerned with the provision of safe water and sanitary excreta disposal facilities for the population. The supply of potable water is the responsibility of the Ministry of Housing and Construction and the National Water Supply and Drainage Board. The Ministry of Health monitors the quality of water and promotes the use of safe water for drinking by community education. The pollution of Sri Lanka’s water resources from various sources including industries affects the supply of safe water for drinking, bathing and washing purposes. The water supply and sanitation programme of the Health Ministry does not cover water resources that are polluted by various sources. The situation may affect the performance of the Ministry’s water supply and
Sanitation programme. In the hierarchy of responsibilities within the Health Ministry, the section dealing with the functions relating to health needs in industry does not rank high.

There are both shortcomings and advantages in the way in which the present system operates. The subject of occupational health being the responsibility of the Labour Ministry ensures that the Ministry has clearly defined responsibility for the occupational health of the workforce. It is however not adequately linked to and co-ordinated with the responsibilities of the Ministry of Health and the Ministry of Industry so that it gets due priority in national health policies and priorities. Consequently it does not become a part of a national system of health surveillance which evaluates its performance within the health system as a whole, identifies problems and needs of occupational health in the context of industrial expansion and strengthens the effort in that field. Similarly in the area of industrial pollution, the health impact could tend to get subsumed in the environmental impact and not receive the special attention it requires.

The System of Health Accountability in Industry

The system of accountability for health in industry would have to be organised in the three main clusters that have been presented in the section dealing with main health-related functions and responsibilities. The three clusters would have to be brought under a co-ordinating mechanism at the sectoral level. This means that the agencies responsible in each cluster would act together and become accountable for the functions that have been identified and the three clusters would be represented at a higher sectoral level in a co-ordinating mechanism for the sector as a whole. This sectoral body could itself function as a committee or unit of the national body which could be a reconstituted National Health Council. The system is presented in detail in the final chapter.

The present paper is limited to the delineation of the system and its constituent parts. It does not examine each function and its implementation in detail. This is done more fully in the main sectoral study which has been used for the analysis in this paper.

(ii) Health Accountability in Agriculture and Food

Introduction

This section deals with the health impacts of agriculture and food. Agriculture accounts for approximately 20% of GDP and employs 34% of the labour force. One category of health impacts of agriculture arises mainly from the changes in technology and from the livestock industry. The other relates to food and nutrition. In this section the health impacts of agricultural technology, livestock, the protection of health and quality assurance in food and
the impact of agriculture on nutrition are considered together as an inter-related set of problems and issues.

The resources of new cultivable land have been almost exhausted through the land settlement schemes of the last 50 years. As a result the future growth of agriculture must come mainly through increase in productivity, more intensive use of the land already under cultivation and diversification with high income yielding crops. The technologies that are required to achieve these objectives such as higher inputs of fertiliser and agro-chemicals are likely to increase the health hazards arising from agriculture. A substantial expansion of dairying and livestock is planned and is aimed at import substitution in milk and an increased supply of animal protein for which demand is increasing with increases in household incomes and changes in diet. With socio-economic changes such as rapid urbanisation and participation of women in the labour force the food industry is undergoing major changes and the demand for processed and packed food is increasing.

All these changes demand much greater attention to the protection of the health of consumers. The problems that arise are of a very complex nature as is evident from the experience of developed countries. They can range from the practices of livestock producers which may encourage consumption of high fat products to pesticide residues in food which come to the market or ground water pollution from agro-chemicals. The health problems in the agricultural sector demand systems and processes which are capable of identifying these problems as they emerge and of monitoring and regulating the relevant activities for timely prevention and control of the potential health risks. As in the case of industry some of health-related areas come under greater vigilance than others. The system for control of quality and regulation of food products is more developed than what is available for the monitoring of the health hazards of fertiliser or pesticides.

The main health problems and issues of the agricultural sector could be broadly grouped under the following heads

- The health hazards of agricultural technology - fertiliser, pesticides and mechanisation
- Health hazards of livestock
- Quality assurance in the food sector
- Nutrition - Agriculture interface
The Current Situation relating to Health impacts of Agriculture and Food.

Microbial Technology

Fertiliser

Prior to withdrawal of the fertiliser subsidy scheme in 1990, consumption of NPK nutrients for rice reached a peak level of 220,000 m.t. while the total consumption in respect of all crops was 525,000 tons.

Although fertiliser usage has increased exponentially over the years with liberalisation no records are available for fertiliser poisoning due to occupational risks. In the formulation, packaging, distribution and storage of fertiliser cutaneous reactions and respiratory irritations arising from ammonia and nitrous oxide gas explosives are known to occur. Here again the long term consequences of such exposures among workers who do not wear masks or use respirators have not been assessed.

Although fertilizer schedules pertaining to NPK ratios for different crops are stipulated, their rationalisation based on soil analysis and soil fertility levels are lacking, resulting in excessive use. Recent assessments on nitrate levels in Kalpitiya permeable soils have produced evidence of serious deterioration in water quality in areas subject to heavy fertiliser use and excessive irrigation. Nitrate concentrations over 10 mg. N/L in potable water causes bowel irritations and methaemoglobinæmia; condition specific to infants where the lungs do not absorb oxygen from the blood circulation. Elevated potassium and chloride levels have been reported in intensive farming systems of Kalpitiya. In non-uniform aquifers spread of contaminants to drinking water wells by diffuse pollution from agricultural wells is considerable.

It is essential to expand ground water surveillance to include other agricultural soil types for better management of fertiliser levels. Further use of biotechnology to produce high yielding but low fertiliser responsive varieties could provide the long term answers to this issue. Agencies responsible for this coordinated effort would be the Department of Agriculture, Crop Research Institutes of applied research, CISIR and Occupational Health Division of the Department of Health. Overall coordination of applied research should be assigned to the Institute of Fundamental Studies which will provide regular surveillance reports and technical advise to the proposed apex organisation. Although research in other countries has demonstrated that intensive agriculture could cause significant nitrate pollution on shallow aquifers and ground water resources, the evidence regarding this phenomenon in Sri Lanka is very limited. In aquifers where ground water is not uniform the dispersion of
contaminants is widespread so that water obtained from such sources poses health hazards especially to young infants as they are susceptible to methemoglobinemia, while in adults recurring gastric irritations could lead to bowel cancer. A study of pesticide pollution in the vulnerable hydro-geological areas of Kalpitiya demonstrates that nitrate and chloride (muriate of Potash) concentrations from dug wells in areas cultivated for over 20-years are 40-50 mg N/litre and 200- mg Cl/litre, respectively as against poorly cropped areas with low level of fertiliser use which showed values corresponding to 2 mg N/litre and 50-120 mg Cl/litre. When nitrate levels in drinking water exceed 20 mg N/litre it is not recommended for human consumption. The high nitrate concentrations (20-30 mg N/litre) reported for Jaffna Peninsula is attributed to rapid leaching of nitrogenous fertiliser to thin permeable soils overlying the karstic limestone aquifer showing fissures and low porosity. Similarly, high concentrations of potash and chloride have been reported.

It has also been observed in studies conducted at Kalpitiya that excessive applications of nitrogenous fertilisers causes nitrogen volatilization to the atmosphere in the form of gaseous ammonia and nitrous oxide which accounts for discrepancies in quantum of fertiliser applied and leached. The atmospheric pollution factor too needs to be determined. It might be desirable to discontinue the use of muriate and find a substitute potassium for use.

Pesticides

Removal of import restrictions in 1977 led to a dramatic increase in pesticide use from 2089 mt. in 1980 to 4,265 mt. in 1986. The pesticides widely used in Sri Lanka for agriculture and livestock production are insecticides, herbicides, fungicides and small amounts of acaricide, nematicicide and rodenticide. Over 75% of pesticides are used for pest control in food crops, followed by weedicides (12%) and fungicides. Some of the more important pesticides used in Sri Lanka are monocrotophos, methamidophos, carbofuran, paraquat, 24-D, MCPA and BPMC.

Pesticide treatments are administered for agricultural purposes in the form of wet and dry formulations. Pesticide sprays (emulsion concentrates and water soluble concentrates) are applied either in the form of high, low and ultra volume sprays using knapsack sprayers, mist blowers and specialised equipment, respectively. Dry formulations are applied in the form of dispersible dusts or granules to soils.

Pre-harvest and post- harvest spray operations are known to cause health hazards to pesticide applicers and farmers. Every 7 per 1000 agricultural workers are affected by pesticide exposure. The Agriculture and Plantation Crop Research Institutes should undertake coordinated research to select environmentally friendly pesticides and other methods of integrated pest management in different agro-ecological zones with a view to reduce
Pesticidal use and attendant risks. Food Department too is involved in large scale fumigation of rice and grain cereals to prevent insect and fungal infestations. Here again the Department of Health should monitor pesticide exposures and build up a reliable data base of pesticide poisoning.

Heavy and indiscriminate pesticide use without adequate attention to functional biological systems and ecological concerns can have serious environmental implications such as soil, underground water and aquifer pollution, biodiversity conservation and sustainability of plants and animals beneficial to man. Agencies responsible for soil and underground water monitoring are the National Water Supply and Drainage Board, Central Environmental Authority, National Aquatic Research Agency and the Ceylon Institute of Scientific and Industrial Research.

Pesticide assessments and routine monitoring of the diverse agro-ecosystems of Sri Lanka is non-existent. Recent research between the Agriculture Department and CISIR on carbofuran contamination of underground water resources in the Kalpitiya range indicates detoxified carbofuran activity (below WHO/FAO ADI levels) in potable water at proximity to intensely cultivated farming systems (over 20 years). Although information on pesticide persistence in aquifers is limited, studies indicate that their persistence in ground water resources could be considerably greater than in soils. Pesticide persistence studies of the more widely used compounds in Sri Lanka are currently being done.

While overall research coordination between agencies (CISIR, NARA, CEA, NWS & DB and private sector) responsible for pesticide surveillance and mitigatory actions is a prerequisite, there is an equally important need for genetic engineering and bio-technological research to select high yielding plant geno-types with low threshold for fertilisers and pesticides. Coordination and direction of R & D should be the responsibility of the Institute of Fundamental Studies.

Food tends to be contaminated when pesticides are directly applied to crops. In Sri Lanka pesticide residues are generally below ADI values prescribed by WHO and FAO inspite of heavy pesticide applications on rice, cash crops and vegetables.

Pesticide exposures can result in either acute or chronic toxicity. The major health concerns likely to be associated with continuous pesticide exposures are (i) carcinogenic reactions or cancer causing, (ii) mutagenicity or damage to genetic material; (iii) teratogenicity or effects on human foetus, (iv) allergies affecting immune systems, (v) and effects on central nervous system. Cancer is easily the most serious of these diseases which needs to be fully researched.
In studies conducted in 1990 at the National Poison Information Centre, 47.3% of all poisoning was due to pesticides leading to the inhalation of acetyl-cholinesterase activity. Out of these victims 10.2% succumbed after admission to hospitals. In the first survey conducted in 1982 on pesticide poisoning it was observed that a large proportion (73%) of cases were suicidal in nature and 17.1% effected were due to occupational exposures. Approximately 14,000 are admitted to hospitals annually from pesticide poisoning; with a mortality rate of 1000/p.a. Five out of every 1000 agricultural workers require hospital care or outdoor treatment.

**Gender-related Aspects of Occupational Health**

The agricultural operations in transplanting and harvesting are carried out mainly by women. These are arduous manual operations. Surveys show that physical ailments are common among women workers during the seasons these operations are carried. The occupational health hazards of women in agriculture have not received adequate attention.

**Livestock**

The health hazards of livestock are of two types - illnesses that can be communicated to humans by livestock and harmful health effects of livestock products that are consumed. The health hazards of the first type are not common or widespread in Sri Lanka with the exception of Japanese Encephalitis which has been associated with pig farming. Some of the health hazards that have been observed are infection from foot and mouth disease, brucellosis, tape worm.

The surveillance of the livestock industry for the health hazards of the second type is also limited. The health and nutritional effects of feeding practices in the livestock industry have not been subject to surveillance or investigation. For example, livestock farmers who are mainly interested in the increase of body weight of livestock marketed for meat may follow feeding practices which produce an excessive fat content. This has been observed in the case of poultry in Sri Lanka. Although the public health authorities undertake routine inspection of slaughter houses and cattle supplied for meat, there is considerable laxity in enforcing standards regarding the health of the animals as well as the sanitary conditions of the abattoirs. The recent outbreak of the mad cow disease in Europe has alerted the health authorities in Sri Lanka regarding the health hazards of feeding practices in the livestock industry and livestock products in general and drawn attention to the need for closer surveillance.
Quality Assurance of Food and Protection against Contamination

Food borne illness and diseases continue to be a major public health problem in Sri Lanka as in other third world countries. These are caused by ingestion of pathogenic organisms such as bacteria, fungi, viruses, moulds etc. or their toxic products.

Food safety and quality can best be realised under specified conditions and requirements that are met during production, processing, storage, distribution and preparation. But in reality the stipulated standards fall short of expectations due to lack of a comprehensive Food Safety Policy/Strategy linking the different food production sectors. Food safety is associated with the type of food system, food technology, nutritional aspects, epidemiology together with certain socio-cultural and ecological factors. The National Health Council and the Food Authority of the Ministry of Health and Sri Lanka Standards Institution are the agencies delegated with the subject of food safety and standards.

The main food contaminants are pesticide residues, metallic materials aflatoxins/mycotoxins, radiations induced and adulterations.

Pesticide contamination of food include premature harvests of pesticide treated food crops. indiscriminate application of heavy doses of insecticides and fungicides as a protective measure during food storage, pesticide coatings on fruits and vegetables and marketing of dangerous pesticides in groceries and food sales outlets.

Metallic materials include lead, arsenic copper, tin cadmium, mercury and chromium. Lead and tin contamination occurs through household appliances and the canning industry. Mercury and copper enter food either through use of organo-mercurial fungicides or industrial effluents.

In Sri Lanka aflatoxins/mycotoxins have been isolated from certain microscopic fungi (aspergillus sp) in groundnut, desiccated coconut, cashew and soya-bean. These compounds act as liver poisons and are carcinogenic. The occurrence and magnitude of these toxins depend on geographical locations, seasonal and humidity changes and storage conditions.

Radiation contamination of foods takes place in exposed food shops, street and pavement food outlets, and polluted beaches where sea foods are dried and cured.

Adulteration is a common occurrence in Sri Lanka. Recent detections include addition of coconut oil to palm and soya flour oils; artificial flavourings; preservatives which have harmful health effects; false labelling of beverages; substitution and adulteration of alcoholic
drinks. Some of the special problems regarding livestock products is discussed in the section that follows.

There is no central collection and publication of data to assess the prevalence and incidence of food contamination and adulteration. Instances when food contamination has caused serious illness or death of a number of persons or in an institution receives publicity in the press. Illicitly brewed alcoholic drinks have caused serious health problems. The supply of illicit liquor continues to be a grave health hazard on a national scale.

Nutrition-Agriculture Interface

Despite impressive improvements in health indices and remarkable achievements in agricultural production during the last decade, the Protein-Calorie Malnutrition (PCM) problem seems to be elusive. The problem becomes more complex due to consumption of foods deficient in iron, iodine, vitamin A, B, C, essential micro-nutrients and fibre. The multisectoral approach to combat PCM is well recognised in Sri Lanka but sectoral interventions have not produced the desired impact. Some of the areas that require examination in the Food-Agriculture Interphase are process technology and storage practices resulting in waste, deterioration of food quality and nutritional losses; production and promotion of low cost nutritive staples in different agro-ecological zones; formulation of simple and inexpensive weaning foods from locally grown crops; development of food fortification technology (iron, iodine, soya etc.) to meet needs of vulnerable children, pregnant and lactating mothers.

The entire food chain commencing from farm gate to market and its associated post harvest technologies results in both quantitative and qualitative losses. Lowering of grain quality and inclusion of a fair proportion of impurities is characteristic of the grain milling industry in Sri Lanka. The flour produced in the giant Prima Flour Milling Complex at Trincomalee with a process capacity of 1800 m.t./day is nutritionally inferior since the flour is devoid of bran and the prescribed fibre level. One of the reasons for bowel cancer is attributed to the fine degree of polish of grain cereals. According to a study of the milling industry by the CISIR, it was observed that in most private mills 7% of bran is lost during milling operations. From a nutritional standpoint bran output should be kept under 4%. Findings also demonstrate that only 10% of rice mills in Sri Lanka are modern. 10% semi-modern and balance consists of steam huller mills.

Inadequacies in present levels of processing and storage causes relatively significant quantitative and qualitative losses in perishables like vegetables, fruits and root crops.
Post harvest fish losses in Sri Lanka are estimated to be around 20-30% due to physical losses, pathogenic infections and enzymatic spoilage. From the time of fish catch until consumption (varying from hours, days, weeks and even months) deterioration of fish quality occurs. Approximately 10% of the fish catch is cured either with salt treated drying, or sun drying or smoking under poor hygienic conditions in polluted beaches and poses serious health hazards.

Main Health-Related Functions and Responsibilities in Agriculture and Food

The main health-related functions in agriculture and food and the agencies that are responsible at present or should be responsible in a system of health accountability are tabulated below, the following heads:

Health Impact of Agricultural Technology

(i) Health hazards of fertiliser use: - Survey and identification of health effects, information and guidelines on use;
(ii) Health hazards of Agrochemical use - Survey and identification of effects on ground water: information and guidelines on safe use and storage;
(iii) Pesticide residues on food.

Agencies responsible
- Ministry of Agriculture
- Department of Agriculture
- Crop Research Institute
- Ministry of Health
- National Water Supply and Drainage Board
- Ministry Of Environment
- The Central Environment Authority
- Ministry of Trade
- Firms

Livestock Industry

(i) Surveillance of livestock industry
    - Control of diseases transmitted from livestock to humans;
    - Control and safety regulation of abattoirs and meat marketing;
(ii) Nutritional standards in livestock industry.
Agencies responsible

The Health Ministry
The Livestock Department
Local Government Bodies
Livestock producers
NGOs and community organisations

Quality Assurance in the Food sector

(i) Establishing standards and criteria for quality control;
(ii) Monitoring and surveillance;
(iii) Enforcement;
(iv) Studies and investigations.

Agencies responsible

Ministry of Agriculture
Ministry of Health
The National Health Council
The Food Authority
Ministry of Industries
National Standards Institute
Ministry of Food - Food Laboratories
Ministry of Fisheries
Government Analysts Department
Ceylon Institute for Scientific and Industrial Research

Private sector food processing firms, distributors, food serving establishments.
Local Government Bodies

Nutrition-Agriculture Interface

(i) Nutritional losses and waste in food processing storage and marketing;
(ii) Food fortification for nutrition;
(iii) Production of weaning foods;
(iv) Crop Diversification for improvement of nutrition;
(v) Nutrition-related crop research.

Agencies responsible are

Ministry of Agriculture
Paddy Marketing Board
Department of Agriculture
The Institutional and Legal Framework

Health Accountability for Agricultural Technology

Formulation and distribution of fertiliser is done by the Ceylon Fertiliser Corporation (CFC) and five other private sector agencies. The operational network for distribution is almost similar to pesticides. Fertiliser recommendations for agriculture and plantation crops is the function of the Department of Agriculture and Crop Research Institutes, respectively.

The importation manufacture and distribution of pesticides are governed and regulated by Pesticide Control Act No. 33 of 1980 which has been subject to several amendments in 92/93 to strengthen implementation. The Act regulates imports, packaging, labelling, storage, formulation, transport, sale and use of pesticides. Although the Act provides for pesticide quality control, analysis against adulteration and pesticide residue determinations to safeguard health of consumers and measures for safe handling of pesticides, implementation of the Act is poor due to lack of infrastructure and trained manpower. Director of Agriculture is responsible for implementation of Act through the Registrar of Pesticides and assisted by a Pesticide Technical Advisory Committee. Enforcement is by district agricultural officers.

Pesticide imports and formulation of technical grades are done by the Ceylon Petroleum Corporation and 9-firms marketing pesticides. Almost 60% of products for the market are formulated locally. In our factories, the working systems, environment and workers are subject to pesticide contamination. Factory modernisation to mitigate health hazards and improve occupational safety of workers is the responsibility of the CPC and firms while the monitoring of pesticide exposures of the workers is the task of the Department of Health.

Distribution too is done by the CPC and firms through 8570 multipurpose cooperative societies, 486 agrarian service centres and 1500 private dealers. Pesticides are often stacked alongside foods in sales outlets. This is dangerous because some flour products have a high coefficient of absorption. The food inspectorate of the Department of Health are responsible for taking corrective action and educating the traders against health hazards.

The sectoral policy statements (PIP-1995-99) and National Policy Framework (1995) of the Ministry of Agriculture, Lands and Forestry refers to rational use of pesticides and fertiliser
perspective) through the adoption of alternative agricultural practices in the long term. However, emphasis will be placed on short-term measures such as training on safe use and handling of agro-chemicals. The policy on National Land Biodiversity Conservation and protection of vital land resources (water, soil) despite enhanced productivity. The Department of Agriculture’s Five Year Plan in 1995 identifies safe systems of development to minimise environmental and health hazards under Sri Lanka’s Environmental/Health Project. The Plan for the commissioning of a pollution facility to assess environmental health created from agricultural pollution technologies.

Sure policy measures and action programme to be undertaken that are likely to have impact on health and environmental concerns are listed below:

Integrated Pest Management (IPM) programmes designed to minimize pesticide usage involving biological, ecological and cultural control procedures either singly or in combination with selective insecticides. Present IPM programmes on rice extended to cover other crops like vegetables and highland cash crops.

Research and development (R & D) is proposed on bio-pesticides, insect attractants, etc. and naturally occurring pesticides such as Okaizirachin formulations to minimize environmental hazards.

Biotechnology procedures will be used to breed high yielding varietal hybrids resistant to pests and diseases and less responsive to inorganic fertilizers. Research will be undertaken by government research institutions and the universities.

Strengthening farmer extension education services on use of pesticides, compliance safety procedures and management of integrated pest control programmes.

Action of integrated nutrient management procedures, promotion of the use of organic materials in combination with inorganic fertilizers and recycling of straw to minimize use of potash.

Safety for Health hazards of Livestock

The legislation on the livestock industry covers some of the health hazards of the livestock. The existing laws provide for control and notification of major animal diseases. Diseases that are transmissible to humans, control of the slaughter of cattle pigs and licensing of diaries within suburban and municipal limits. Animals are inspected for physical conditions and permits issued for slaughter. The agencies responsible are
Livestock Department and the local authorities. There is however no systematic and regular surveillance and enforcement of standards in the livestock industry for all its health and nutritional impacts.

Accountability for Quality Assurance in Food

The Food Act covers the manufacture, sale, distribution, import and seizure of foods. It prohibits the sale of any form of food which is substandard as prescribed by the specifications made under the Sri Lanka Standards Institution Act for both local and export food items. The Food Advisory Committee (FAC) of the Health Ministry administers the Food Act. Enforcement is done by public health inspectors of the Department of Health. The Chief Medical Officer of Health acts as the Food Authority for local authorities and operates through its own independent inspectorate. Although the legal provisions of the Food Act is quite comprehensive, it has not made a commensurate and significant impact on the food control system due to lack of effective central coordination, duplication of technical functions despite serious limitations in resource availability and manpower and other support facilities.

The Sri Lanka Standards Act formulates national standards for all items including foods, provides quality assurance schemes for safety of processed and prepared foods and identifies product standards and codes of practice for (i) manufacture of processed foods, (ii) pesticide residues in foods, (iii) and for catering establishments. SLS Act is responsible for the production certification scheme for manufactures to obtain the SLS mark; voluntary pre-export inspection scheme for spices, cashew, sesame etc.; voluntary registration scheme for export of fishery products; and Sri Lanka Standards ISO-9000 quality system certification scheme for industry.

Consumer Protection Act of 1979 with amendments in 1980 and 1992 regulates sale of articles (including food items) not conforming to SLS specifications. Implementation of Act is done by a strong inspectorate numbering 227 under Commissioner of Internal Trade. The Controller of Imports and Exports Act governing imports of 26 food items is administered under the import inspection scheme of the SLSI. Under this Act the Authority for food imports is the Director General of Customs.

While macro-level of food safety and quality control is being monitored by various food control agencies (SLSI, CISIR, Government Analysts Department, Central City Laboratory of Colombo Municipal Council; 3-food laboratories of Health Department; Quality Control unit of Food Department; RPDC and private labs.) under the guidance of the Food Advisory Authority, the inspection and supervisory function at the regional/local level is the responsibility of local government institutions and public health inspectors of the Provincial Health Services.
The favourable scenarios proposed by successive administrations on Food and
Agriculture policy and backed up with impressive legislative measures together with
impressive infrastructure development, the performance has not matched the goals and
objectives.

Complex policy issues pertaining to pre and post harvest technologies, grain milling,
storage and the vast area of food control, hygiene and safety were dealt with by
Ministries and Agencies independently of each other with limited or no inter-
coordination.

The policy objectives articulated by government relevant to health and nutritional
standards for this study are identified for implementation in the most recently
formulated Agricultural Policy Framework document of government, viz. -

- Production of low cost technologies along with suitable farmer education to improve
  processing, packaging and transportation of farm produce at the field level.
- Progressive upgrading of present methods of farm storage with relatively cheap
  scientific techniques to prevent quantitative and qualitative losses.
- Modern methods of drying and preservation will be given particular emphasis through
  effective use of technological inputs.
- Modernization of the agro-food industry to meet both local and foreign demand while
  bearing in view the need for maximum conservation of nutrients and food quality.
- Ensuring quality control systems and regulatory mechanisms envisaged in the revised
  Food Act of 1990 and other supportive legislation to be strengthened and enforcement
  procedures implemented to ensure availability of wholesome, safe and nutritious food.

The Food Advisory Council in the Ministry of Health to be reconstituted and
international arrangements put in place with a view to devise a more effective food
control system than hitherto available.

Research and Development (R & D) institutions responsible for food process
energies, quality control and surveillance and nutritional improvement/fortification
of foods be upgraded and their activities coordinated through a National Research
The System of Health accountability in Agriculture and Food

The system of health accountability in agriculture and food would have to be organised in five main clusters described in the section on health-related functions and the agencies responsible. The institutional arrangements would comprise a network of five clusters of agencies and institutions with one cluster for each of the five elements. The clusters will include the agencies that are identified in the section on functions and the agencies responsible for them. These five clusters would need to function under the overall direction of a co-ordinating body which could be established as a committee of the apex body at the national level which would be the National Health Council. This would then be another well defined unit of health accountability responsible to the national level. Each cluster would be responsible for a system of monitoring and surveillance in the relevant area and will make its report and recommendations to the apex body which will initiate necessary action. The responsibility of each agency in each cluster would have to be clearly identified and defined, together with the legal framework pertaining to the cluster. The structure of accountability that is envisaged and the essential activities are further discussed in the section on the national system.

(iii) Accountability for Pharmaceuticals

Introduction

Pharmaceuticals, its control and use is an integral part of the health care system. It is brought into this study which is primarily concerned with health hazards generated in the activities which are outside the purview of health as the trade in pharmaceuticals and problems of quality assurance involve a number of other agencies. The systems of control and quality assurance in pharmaceuticals are also becoming increasingly important with rising levels of education and health awareness of the population and the tendency to resort to self care and self medication. While it is true that the major share of pharmaceutical use is under medical prescription, their import manufacture and dispensing through pharmacies require close supervision. At the same time information on the harmful effects of drugs, particularly their long term consequences is not readily available. Developing countries also entertain suspicions that drugs of poor quality, which are not upto the standards applied in developed countries are not approved for use in those countries or which have not been adequately tested are being exported to developing countries. For all these reasons the system of accountability for pharmaceuticals is critical for quality assurance in the health care system as a whole.
Early 1970s, Sri Lanka undertook a major re-organisation of the pharmaceuticals sub-
State Corporation was established and given the monopoly and wholesale
ration of pharmaceuticals. The government introduced schemes for the rationalisation
of drugs and promoted the practice of prescription under generic names. While the re-
novation was beneficial in many respects the monopoly in the trade in drugs led to
shortages and also a lowering of quality in some cases. With the liberalisation
of economy the state corporation no longer enjoys a monopoly and is in
onction with the private sector.

Main problems and issues in the pharmaceutical sector relate to
The trade in pharmaceuticals—supply and distribution
Quality Assurance
Cost and Pricing
Rational use of drugs and prescribing patterns

Although not included narcotic drugs and addictive substances (tobacco and alcohol)
ther are special programmes under the main health care system.

Current Situation in relation to Accountability for Pharmaceuticals

Distribution and Accessibility

Health infrastructure in Sri Lanka is well established and is continuing to expand and
The median distance a person needs to travel to a health facility with allopathic
es is only 3 km.

There are 504 hospitals, 385 central dispensaries and 252 DDHS units in the state sector
essential drugs are available free of charge to the population. Also at the numerous
health clinics scattered throughout the island, essential vaccines and some essential
are available.

Private sector services are mostly concentrated in the urban areas provided by 800
general practitioners. 85 private hospitals, 662 retail pharmacies and a few diagnostic
laboratories. There are however unregistered pharmacies (nearly 500) and “quack doctors”
in Sri Lanka where drugs could be easily obtained by the public.

Sri Lanka had over 4000 drugs registered by 1993. In an analysis of 3436 pharmaceuticals
products registered in Sri Lanka, 20% were sold over the counter (OTC) and 80% were
dispensed on prescription only. There have been 75 importers who have purchased from 245
manufacturers from 43 countries. Sri Lanka mostly imports finished or fully processed drugs.
The State Pharmaceutical Manufacturing Corporation (SPMC) manufactures 40 essential
drugs. The drug requirements of the public sector are limited to 400 drugs (National Health

In the state sector the purchase and distribution of pharmaceuticals is centralised. The drugs
are procured by the state pharmaceuticals Corporation (SPC) and stored and distributed
The Medical Supplies Division (MSD) on a quarterly basis directly to the health institutions in the Ministry of Health and to the 22 Divisional Drug Stores (DDS) in the provinces.

The State Pharmaceuticals Corporation is the largest importer of drugs to Sri Lanka. It makes purchases from reputed manufacturers and suppliers of drugs by world wide tenders on favourable terms. All items imported are batch tested and certified for quality and the SPC does not import any product which does not have a free sale in the country of manufacture. The policy of giving priority to the import of essential drugs is being continued since its inception in 1971. The SPC makes direct sales to the government institutions including the armed forces. It has a drug distribution network comprising ten retail outlets (Osu Salas) of which three are in Colombo. Their service to the customers is quite impressive. The drugs are 10-15% cheaper than in the private sector sales outlets. The staff are qualified and professional standards are maintained. The Osu Salas (retail outlets) though few in number exert a stabilising effect on drug prices. The Osu Salas’ overall contribution is 30.2% of the retail trade.

The SPC sells through its authorised distributors who are holders of drug licences issued by the Cosmetics, Devices and Drugs Authority. The SPC’s sales representatives undertake sales tours in their respective territories in Sri Lanka. Through all these channels the SPC covers around 600 pharmacies and 1200 doctors. The SPC has estimated that it has a market coverage of 80% and a market share of 34% respectively.

In the 70s there have been five large TNCs with subsidiaries operating formulating and packaging plants in Sri Lanka which accounted for 75% of local drug production. Two local companies, producing under license for TNCs accounted for 22%. The remaining seven products were small local manufacturers. In the 90s there were 15 TNCs operating in Sri Lanka and 36 local manufacturers which are small companies producing 182 products - mostly external applications and over the counter products. The largest local manufacturer is the SPMC.

The availability of several over the counter drugs (OTC drugs) in pharmacies and other sales outlets like groceries and shops facilitates the general public to purchase these drugs without a prescription. For instance paracetamol and its several brands and oral rehydration salts (ORS) are freely available and easily purchasable in Sri Lanka.

Quality Assurance

The Cosmetics, Devices and Drugs Act No. 27 of 1980 (as amended by Act. No. 38 of 1984) is the legislative framework that controls the registration, manufacture, importation, transportation, sale, labelling, advertising, distribution, testing and disposal of drugs. The Poisons, Opium and Dangerous Drugs Ordinance (Chapter 218) as amended by Act. No. 13(1984) regulates the importation, storage, distribution and use of poisons, opium and dangerous drugs.

These two legislative enactments are considered to be comprehensive pieces of legislation. However, the CDD Act does not cover homeopathic and ayurvedic drugs. The Consumer Protection Act No. 1 of 1979 provides provisions to safeguard the general public from
inscrupulous sales including drugs. The policies, strategies and the legislative framework encourages wide coverage and rational use of drugs in Sri Lanka.

Sri Lanka became a signatory to the 1988 International Drug Convention in addition to the 1961 and 1971 conventions in the control of drug abuse. The Drug Regulatory Authority and the National Dangerous Drugs Control Board were established with the onus of controlling drugs. Revisions of drug regulations have made generic prescribing obligatory and all mass media drug advertisements of over the counter drugs should have the approval of the Drug Regulatory Authority prior to advertising. Registration of drugs and licensing of pharmacies became formalized and the Drug Regulatory Authority became a regular source of public income.

There are three regulatory mechanisms: The Drug Registration and Licences Division; The Enforcement Division and the National Drug Quality Assurance Laboratory (NDQAL). Fig. 4 shows the organization for Drugs Administration in Sri Lanka.

In Sri Lanka every drug has to be registered with the Drugs Regulatory Authority whether it is imported or locally manufactured. For the registration of imported drugs the authorised local importer representing the principals abroad, has to submit an application to the Drug Regulatory Authority. It should be accompanied by a Good Manufacturing Practice (GMP) certificate.

For locally manufactured drugs, the manufacturer should obtain approval for the formulation, have samples tested and the manufacturing plant examined by the DRA for GMP.

After initial processing at the DRA, the Drug Evaluation Sub-committee chaired by Director/Medical Technology and Supplies, the applications screened by experts that include the Professor of Pharmacology, Faculty of Medicine, Colombo; reviews and gives the verdict on registration.

The Enforcement Division assists in the enforcement of the CDD Act. The authorised officers carry out inspections of manufacturing, distributing, organisations and sales outlets of pharmaceuticals. There are several categories of authorised officers. The Food and Drugs Inspectors are the key authorised officers who work on an advanced programme. and inspect pharmacies and sales outlets and institute legal action, mostly for selling unregistered drugs, unlicensed pharmacies and selling drugs in schedule II (prescribing only drugs) without prescriptions. They also conduct surprise inspections on public or professional complaints on irregular and unsafe sale of drugs. The Director Medical Technology and Supplies together with the Food and Drug Inspector(Drugs) carries out monthly flying squad operations for inspecting pharmacies and also carries out GMP inspections.

The National Drug Quality Assurance Laboratory (NDQAL) is the technical arm of the quality assurance system where drugs (both finished and raw materials) are tested for quality. Local manufacturers are inspected about once a year by Food and Drug Inspectors for G.M.P certification. There is a scheme to sample products from local manufacturers for QC reports every 5-6 batches, while existing products are sampled once in 10 batches at least once a year. On occasions of doubt for quality, imported products are analysed for quality. About
500 drug samples are annually analysed by the NDQAL. Only a few selected samples of drugs from the State Pharmaceutical Corporation (tender samples), random samples collected from new drug consignments by the Medical Supplies Division and new drug samples of drug samples awaiting registration at the DRA are quality tested during pre-marketing quality surveillance. Periodic post marketing surveillance of drugs is carried out by the NDQAL on a priority schedule based on ABC analysis of drugs in the state sector, drugs with bioavailability problems, and drugs with public or professional complaints about their quality. In 1992 the NDQAL analysed 600 drug samples and 90% conformed to quality standards.

The Medical Supplies Division is a new air conditioned store with facilities for refrigeration built at a cost of Rs.4000 million under a Japanese grant aid. However, some warehouses and institutional drug stores are not equipped to store more thermolabile products. During transportation and storage drugs get exposed to extreme environmental conditions. In the case of vaccines, the cold chain is maintained during the import, storage and distribution to the point of use at institutional or field MCH clinics.

In Sri Lanka the Cosmetics Devices and Drug Technical Advisory Committee (CDDTAC) meets monthly to discuss issues on pharmaceutical and advises the Minister of Health on policies and decisions in respect of drugs.

The CDDTAC is chaired by the Director General of Health Services and includes members like the SPC, Medical Technology & Supplies, DDG(Lab Services), Professor of Pharmacology (University of Colombo) and representatives of professional associations.

This committee is a national committee, takes decisions to withdraw the registration in the case of drugs on which questions of safety, quality and efficacy have arisen. Gazette notifications and press releases of important issues are some outcomes.

Another mechanism for ensuring the quality of drugs is the sub-committee for monitoring Drug Advertisements that screens all mass media advertisements for "over the counter drugs" before these are released for advertising - (TV - Newspapers - Posters).

The prescribers are encouraged to report adverse reactions of drugs to the Drug Regulatory Authority/Drug Quality Assurance Laboratory and formats are given in the "Manual on Management of Drugs" and the "Prescriber".

The Drug Review Committees at Provincial, Divisional and Institutional levels too are expected to look into the quality aspects.

Cost and Pricing

Studies of the cost of drugs to patients indicated that the per capita cost of drugs per outdoor patient was Rs.3.13 and that of an indoor patient was Rs.24.78 respectively when standard drugs were used. The rates increased to Rs.7.09 and Rs.77.87 when prescriptions were outside the standard schedule.

Availability of different brands of drugs at various costs is a problem to the patient specially when he has to purchase these from private pharmacies. Even though medical care is
believed to be free of cost in the state sector, both the inpatients and outpatients, at times have to procure drugs when they are not available in some state hospitals or when physicians prescribe their preferred brand products. In a study involving 10000 households in four districts in Sri Lanka it was revealed that on the average a patient has to pay approximately Rs. 43/- for drugs and it accounted for 52.38% of the overall cost structure.

The pricing policy of the SPC which has a market share of approximately 30% has a significant stabilising effect on the retail prices of drugs. Since 1979 the SPC has applied a new pricing policy for imported drugs: a two-tiered pricing structure, one for the essential drugs and another for non-essential drugs.

The SPC has a list of drugs of which 137 drugs cost less than 50 cents a tablet or a capsule and 65 drugs each costing between 50 cts to one rupee.

The Manual on Management of Drugs (1993) states that all drugs with generic names should be prescribed by their generic name. The revised drug regulations of Sri Lanka has included the generic clause, but still, brand names are seen in prescriptions.


A Drug Information Bulletin is being published quarterly since 1988 and the Sri Lankan Prescriber is being published by the SPC. A revised edition of the Sri Lanka Hospitals Formulary was published in 1993.

The Medical Supplies Division publishes the Drug Estimate books on an annual basis and the price list of drugs. Those estimate books were revised in 1988.

The Fair Trading Commission publishes the Gazette on prices of drugs that are registered in Sri Lanka.

The Cosmetics Devices and Drugs Authority periodically publishes a list of registered and deleted drugs through the gazettes.

After 1977 with the change in the government's policy towards liberalization the SPC ceased to be the sole importer of drugs and private importers were once again given foreign exchange allocations to import drugs. Liberalization favoured the emergence of expensive brand products discretionary generic drugs. At the same time it provided easy access to low quality drugs. There was also an increase in public expenditure on drugs.

Attempts to lower the drugs costs have not been very successful in Sri Lanka as in many other countries. There is pressure from the drug importers and Sri Lanka is not yet self reliant in drugs.
Rational Use of Drugs

Several initiatives have been taken in Sri Lanka to encourage rational drug use (RDU). The drug regulations have been revised to include a clause on generic prescribing. The Guidelines to Intern Medical Officers (1994), The Manual on Management of Drugs (1993) and the Manual on Management of Hospitals (1994) impart valuable instructions to the prescribers on RDU.

Essential drugs are those that satisfy the health care needs of the majority of the population; they should therefore be available at all times in adequate amounts and in appropriate dosage forms (WHO 1989). In Sri Lanka, the essential drug lists drugs are classified under the same 27 broad groups as in the WHO list. Although the WHO introduced the concept of essential drugs in 1975, Sri Lanka applied this concept in 1959 when the first Formulary Committee reduced the number of drugs used in the state sector from 1000 to 500 and in 1963 the private sector drugs imports were reduced in number from 4000 to 2000. After the formulary based on 500 drugs was produced in 1959, Sri Lanka published the first essential drug list in 1985 and revised it in 1988. Essential drugs are extensively used in Sri Lanka.

In the government institutions the mechanisms for careful prescribing of drugs has been attempted by advocating rational prescribing practices. These include prescribing drugs by their generic name, adhering to standard drug treatment schedules and essential drugs, restricting OPD prescriptions for minimum period not exceeding three days and restricting clinic patients drug supply for not more than two weeks.

The medical faculties of the universities have introduced RDU, generic prescribing and essential drugs into the training curriculum of medical students. Production of supplementary reading material on the topic of rational drug use, and the introduction of project work into the curricula of medical students, pharmacists and the relevant health workers could generate a better understanding of the subject as well as create and develop a sensitivity to cost consciousness in the management of pharmaceuticals. The officers of the Health Education Bureau in particular and in general any responsible health manager including the prescribers can make use of the school clubs, welfare organisations, professional bodies and non-governmental organizations to popularize RDU and cost consciousness.

The proportion of drugs wasted is high and the financial value amounts to Rs. 10 to 11 million annually (Manual on Management of Drugs 1993). Common causes of drug wastage are: over prescribing drugs on patients demand; overstocking and prescribing unnecessary expensive brand name drugs and failure to use before expiry date.

Main Functions and Responsibilities in Relation to Pharmaceuticals

Supply and Distribution

(i) Imports
(ii) Local manufacture
(iii) Wholesale and retail distribution
Agencies responsible are
   The State Pharmaceutical Corporation
   Director General of Customs
   Government medical institutions
   Private manufacturing
   Private importers
   Private Pharmacies for retail distribution

Quality Assurance

(i) Registration of drugs
(ii) Approval of local manufactures
(iii) Laboratory testing for quality
(iv) Inspection of pharmacies and enforcement

Agencies responsible are
   Ministry of Health
      The Drugs Regulatory Authority
         - the Drug Registration and Licences Division;
         - the Enforcement Division
         - the National Drug Quality Assurance
   Laboratory(NDQAL).
      National Dangerous Drugs Control Board

Cost and Pricing

(i) Pricing policy
(ii) Publication of price list

Agencies responsible are
   Ministry of Health
      -Medical Supplies Division
   The Fair Trade Commission
   The State Pharmaceutical Corporation

Rational Drug Use

(i) Essential Drug list
(ii) Generic prescribing
(iii) Drug Information
(iv) Drug Advertisement
(v) Monitoring the use of drugs
(vi) Training of medical officers in RDU

Agencies responsible are
   Ministry of Health
   Professional Bodies
   Teaching institutions
Prescribers (Medical Practitioners)
Providers (Pharmacists)
Patients
Private Firms
Media

System of Accountability for Pharmaceuticals

For the Pharmaceutical subsector the legal and institutional framework has been incorporated in the section which deals with the current situation. Sri Lanka has developed on the whole a clearly defined system of accountability for most areas of accountability in the pharmaceutical sub-sector of health. However implementation and monitoring is weak in many areas. Some important gaps and deficiencies in the prevailing system of accountability are given below.

Although pharmacies are restricted in issuing scheduled drugs, i.e., by prescriptions only, it is observed that in most of the Districts some pharmacies sell to the public these drugs without prescriptions.

There is evidence of smuggling of drugs into the country. Certain drugs which have not been registered have been found in some pharmacies. This is a dangerous trend as spurious and counterfeit drugs may take a foothold in the country.

The enforcement of existing regulations for quality assurance through authorized Officers, mainly the Foods and Drugs Inspectors who are the implementing authorities of the Drugs Regulations is not adequate and needs to be strengthened.

The shortages of pharmacists, their skill development and career promotions are issues of growing concern. Pharmacists must be more actively involved in the implementation of the drug regulations.

There is no formal responsibility in the Ministry of Health for education of the public on drugs although some ad hoc activities are organized and implemented.

The use of standard treatment schedules and essential drugs is often overlooked in major hospitals. The results of the morbidity survey in 1988 have not been advantageously extended to the hospitals in the state sector.

The decentralization of management and devolution of powers to the provinces and divisions should have been able to contain drug costs. But in Sri Lanka such evidence is lacking.

As mentioned earlier Sri Lanka has a high proportion of drug wastage - about Rs. 10 million worth of drug is wasted annually. Effective management and cost conscious could cut down such wastage. Avoiding overstocking of drugs adherence to first in first out procedures, preventing drug pilferage, and using drugs before the expiry date etc., could reduce drug wastage.
A wide range of retail drug prices are in operation for the same drug though chemically and biologically identical. This is due to the presence of several brands of the same drug at different prices which are many times high in price than the generic product. If the prescribers prescribe the generic drug or the number of brands are limited, cost-effectiveness in pharmaceuticals could be achieved. It might be difficult for the DRA to reduce the number of brands, as the Sri Lanka Drug Regulations does not have the "Needs Clause". But the DRA could exert pressure on patent rights of branded products and demand evidence for their effectiveness, safety and efficacy.

Provision of information about drugs to the prescribers is extremely important - not only about the technical aspects but also of the costs, so that they are able to select the most economical treatment regime for the minimum duration.

Most of these deficiencies could be made good if the available system of accountability is implemented effectively. This would require above all a system for the monitoring of implementation.

Monitoring is the weakest area in all the components of accountability that have been described. It is particularly weak in the area of rational drug use and public education. Monitoring mechanisms for the issue, distribution, storage, quality and consumption of drugs are clearly laid down in several publications including that in the manual on management of drugs. These monitoring activities are however not regularly carried out. For example drug review meetings have to be conducted periodically at different levels of the health care delivery system. But these are rarely put into practice. A set of indicators on rational drug use has not yet been identified and introduced into the system.

The monitoring process could be strengthened by incorporating the individual monitoring mechanisms and activities within a system of monitoring for the sub-sector as a whole with a periodic regular review and monitoring of the entire sub-sector (for example half-yearly) at the level of the Director General. A set of indicators could be developed for all the key activities such as rational drug use which could be used in a review.

(iv) Health Accountability in Transport

Introduction

The rapid growth of the modern modes of transportation is resulting in major changes in the physical environment. The health hazards that are associated with these changes - accidents and air pollution - are already major causes of morbidity and mortality. The acceleration of economic development and urbanisation that is taking place as result of the economic reforms and the export-led industrialisation strategy will lead to a continuing expansion of the modern transport sector and the health hazards associated with it. The main health related problems and issues in the transport sector are those of physical injury resulting from traffic accidents and the health hazards of environmental pollution caused by the transport sector.
Health Impacts of the Transport Sector - Current Status

Accidents

The total fleet of motor vehicles of all types expanded more than six fold during the last 20 years, growing at about 9% annually. During the period 1980-1995 fatal accidents have increased by 29% and those causing grievous injuries by 46%. An analysis of the leading causes of hospital deaths available for 1989 showed that deaths caused by transport accidents ranked 9th with 10.4 deaths per 100,000 immediately higher than deaths caused by intestinal infectious diseases which were 10 per 100,000. The mortality rate for males from transport accidents was much higher than for females- 17.4 per 100,000 compared with 3.4. Similar data are not available for morbidity. With the rapid increase of vehicular traffic major accidents involving the death of several persons such as passengers in buses and vans and families in private cars have become more frequent. These have been attributed mainly to reckless and incompetent driving, poor mechanical condition and safety standards of vehicles, inadequate development of the road system to accommodate the vastly increased traffic flows. Safety belts are not as yet compulsory in Sri Lanka.

Accidents occur due to a wide variety of causes which are broadly grouped in three categories:

- the problems relating to roads and traffic flows ranging from lax control of traffic flows, absence of adequate measures for road safety for pedestrians, failure to undertake the required corrective measures in locations, such as road intersections inclines and bends which are accident prone

- problems relating to the vehicles, their safety standards, their road worthiness mechanical condition and maintenance

- the action of pedestrians and drivers

There are no published data analysing transport accidents by their causation. As a result there is no co-ordinated strategy and programme for the prevention of accidents by identifying and dealing with the different causes leading to accidents

Air Pollution

The data on air pollution due to transport is contained in Table V in the section on industry. The major source of urban air pollution in the metropolitan area is the transport sector. These comprise particulate matter, nitrogen oxide, hydro-carbons and carbon monoxide. Studies conducted to estimate the air pollution levels in the colombo Metropolitan area indicated the critical locations were found to be near traffic intersections and industrial areas. The prevailing situation in relation to some of the pollutants such as carbon monoxide and sulphur dioxide were below the limit proposed while nitrogen oxide was higher. A comparison with some other Asian countries revealed that values for fine dust and total suspended particles were much greater in Sri Lanka than for Indonesia, Philippine, Thailand, Malaysia and Singapore.
As was noted, in the study on industry the diseases of the respiratory system rank fourth among the causes of hospital morbidity in 1993. A wide variety of causes have contributed to the high incidence of morbidity from respiratory diseases of which air pollution is a significant contributory cause. The data available is insufficient to determine the extent to which air pollution contributes to such morbidity. Furthermore, the transport sector is not the only source of air pollution, the industrial sector and households are also major contributors. Another factor that has to be taken into consideration is that respiratory ailments and indispositions caused by environmental pollution reduce the well-being and productivity of people even if they do not lead to hospitalisation or episodes of severe illness. The impairment of well-being and conditions of ill-health that may arise from environmental pollution are often ignored and their long-term consequences not subject to systematic investigation. This is particularly applicable to developing countries.

The extent and intensity of air pollution from transport would vary depending on the efficiency of the transport system. An efficient transport system can control and mitigate problems of air pollution by a wide range of measures such as traffic management to reduce traffic congestion; developing road systems which bypass residential areas; monitoring the road worthiness of vehicles, prescribing pollutant standards for vehicles and pursuing other environment-friendly policies such as electrification of selected segments of the transport system and conversion to natural gas. Some of the other measures for pollution abatement such as regulating the lead content of gasoline or discouraging the use of diesel may not be possible for a developing country to adopt on its own without external assistance, as the economic costs of such measures may be greater than the environmental benefits they may bring.

NGOs and local communities have frequently expressed their views on road development projects and protested against projects which adversely affect the quality of the environment, particularly, of residential neighbourhoods. In such instances the government attempts to reconcile the conflicting interests.

Health-related Functions and Responsibilities of the Transport Sector

The main health-related functions of the Transport sector and the agencies responsible are given below.

**Accidents**

(i) The survey, documentation and analysis of transport accidents
(ii) Licensing, regulating and monitoring motor vehicles for their road worthy condition and safety standards
(iii) Testing and maintaining standards of competence of drivers
(iv) Road improvements and development for prevention of accidents
(v) Traffic management planning and control for road safety
(vi) Measures for safety of pedestrians
(vii) Public education
The agencies responsible are
Transport Ministry
- Commissioner of Motor Transport
- Registrar of Motor Vehicles
Highways Ministry
Police Department
- Traffic Division
Health Ministry
Education Department
NGOs
Firms in the motor vehicle trade and industry

Air Pollution

(i) Surveillance and monitoring for air pollution of transport
(ii) Road planning and development
(iii) Traffic management
(iv) Prescribing and enforcing emission standards for vehicles
(v) Inspection and monitoring of vehicles
(vi) Policies and incentives for abatement of air pollution from transport

The agencies responsible are
Transport Ministry
- Commissioner of Motor Transport
- Registrar of Motor Vehicles
Ministry of Environment
- CEA
Ministry of Health
Highways Ministry
Police Department
- Traffic Division
Firms in the motor trade and industry
NGOs

The Institutional and Legal Framework

Accountability for Prevention of Accidents

The existing legal and institutional framework is adequate for the basic tasks of registration and annual licensing of vehicles and licensing of drivers. Legislation relating to Motor traffic exists to cover these aspects as well as motor traffic offences. The Registrar of Motor Vehicles is responsible for registration and annual licensing of vehicles and the Commissioner of Motor Transport for licensing of drivers. The Traffic Division of the Police Department is responsible for dealing with traffic accidents, enforcing traffic regulations and prosecuting offenders. Lorries and heavy vehicles are subject to regular testing for road worthiness. There is however no regular testing of cars and light vehicles for road worthiness or safety standards. Nor is there any periodic testing of drivers for their competence and physical fitness, vision and hearing. Sample surveys of bus drivers and lorry drivers revealed a high
proportion of drivers who were below the required standard of competence; a number of drivers also suffered from impaired vision.

Traffic management and regulation on a day to day basis is the function of the Traffic Division of the Police Department. Traffic planning, rationalisation of traffic flows through such measures as one way streets, demarcation of lanes is the combined responsibility of the Transport Ministry, local government authorities and the Police Department.

Road safety measures and promoting awareness among drivers and public on road safety is undertaken by the Traffic Division of the Police Department.

The Transport Ministry and the Highways Ministry are responsible for the planning, development and maintenance of roads. The main objectives of road development are economic and are aimed at improving the economic infrastructure for development. Safety considerations are taken into account but do not receive special attention and analysis.

**Accountability for Health Impact of Air Pollution from Transport**

The responsibility for surveillance and monitoring of air pollution lies with the Central Environment Authority. The institutional and legal framework is described in the section on industry.

At present there is no legislation or regulatory system which prescribes and enforces standards regarding pollutant emissions from vehicles.

The authorities responsible for traffic management, road planning maintenance and development described above would have to take into account the environmental considerations of traffic flows and road development. New road development projects would be subjected to EIAs and the health and pollution impacts would be included in these assessments. It is not certain whether the present system invariably pays specific attention to these aspects. While most of the problems causing a high degree of air pollution such as traffic congestion would be attended to as part of the economic efficiency of the road and traffic system, the trade-offs between economic costs and environmental quality may lead to the neglect of the environmental aspects unless they are specially kept in focus.

**The System of Accountability for Health Impacts of Transport**

The system of accountability for prevention of transport accidents and mitigation of air pollution would have to be organised around the two main sets of responsibilities and the agencies involved as described in the section. They could be co-ordinated by a sectoral coordinating mechanism which could function under the National Health Council as in the case of industry and other sectors that have been already discussed.
Health Accountability in Tourism

Introduction

From the mid 1960s Sri Lanka’s development strategy has given high priority to the growth of the tourist industry and the economic benefits that it can bring. Between 1971 and 1980 tourist arrivals increased eightfold from 39,000 to 320,000. In the mid eighties the tourist industry suffered a severe set back due to the unsettled conditions in the country as a result of the ethnic conflict and as well as the civil unrest in the South of the country. The industry recovered in the 1990s and tourist arrivals reached 400,000 in 1994 and 1995. The tourist industry has a high potential for expansion; its growth has stalled mainly as a result of the terrorist attacks and the violence resulting from the ethnic conflict. With the resolution of the ethnic conflict and the restoration of peace and security the industry could resume the trends of high growth experienced in the 1970-1983 period. The plans for the tourist industry envisage a substantial increase and estimate that tourist arrivals could reach 800,000 in the next 10 years.

The main health hazards of the tourist industry are associated with the environmental pollution caused by the hotel industry, particularly the marine environment around the beach resorts and the spread of sexually transmitted diseases with the increase in prostitution, including child prostitution and homosexual prostitution. AIDS has emerged as a health problem causing serious concern. It is in this context that the health impacts of tourism need to be monitored and kept under surveillance.

Health Impacts of Tourism - the Current Situation

Environmental Pollution

Environmental pollution resulting from the expansion of tourism arise mainly from the extensive use of locations in the immediate vicinity of the beach for hotel development. The beach resorts along the coastal belt accounted for 1.2 million "guest nights of the total of 3 million in 1995. These hotels account for more than one third of the total capacity for tourist accommodation in the country. Unregulated development of beach resorts lead to various types of degradation and pollution of the beach and the marine environment. Although private sector firms normally protect their own beach front, the arrangements for the disposal of waste and refuse from the beach are not always adequate environment. The health hazards which cause most concern are those arising from the disposal of hotel sewage and garbage. There is evidence that sewage and refuse gets washed back to the shore, estuaries and inland waterways if the sewage is discharged at distances less than a kilometer.

Sexually Transmitted Diseases

The available data on reported cases of sexually transmitted diseases (STD) from state institutions indicates that there has been a slight decline in the incidence of many STDs such as Infectious Syphilis and Gonorrhoea. These reported trends however have to be treated with caution as they do not cover cases treated by private practitioners. Owing to reluctance of patients to disclose information it is likely that there are considerable numbers who resort to private medical treatment.
The first case of HIV/AIDS was reported in Sri Lanka in 1987. By 1996 the number of documented HIV cases had increased to 172 with 58 cases having developed AIDS. The health authorities estimate the number of HIV cases is much larger and likely to be about 6800. On this basis the prevalence rate is 0.06 percent which is lower than the average for Asia. A recent assessment of the situation relating to the spread of HIV in Sri Lanka suggests that there are several factors which make Sri Lanka vulnerable to the AIDS epidemic. These include the country’s proximity to India which is experiencing a rapid increase in the incidence of HIV and is projected to be among regions with the highest incidence, the large proportion of Sri Lankans obtaining temporary employment abroad and the rapid increase of tourism. One estimate projects that by 2005 Sri Lanka would have as many as 80,000 cases of HIV and a prevalence rate of 0.54%.

There are no reliable data for basing conclusions regarding tourism as a source of infection. A recent report concludes that on the reported data the tourist inflows have accounted for a negligible proportion of new infections and that the tourist inflow is unlikely to contribute significantly to the transmission of HIV/AIDS. Certain negative aspects of tourism however indicate that the potential of tourism for transmission of STD and HIV/AIDS could be high. First the tourist inflow of 400,000 in 1994 is high in relation to the country’s population -23 per 1000. This could rise to over 40 by 2005. Although there are no representative surveys of the spread of prostitution in the areas with high concentrations of tourism, numerous cases of child prostitution and homo sexual prostitution among youth have been reported by investigative journalists and also brought to courts. Some of these cases indicate that commercial sex has led to a serious breakdown of family values among certain sections of the communities in the vicinity of tourist areas. There is also an international network which has advertised Sri Lanka as a location where child prostitutes and homosexual prostitutes are freely available to foreign visitors. Consequently Sri Lanka appears to be attracting a small category of tourist who are in search of commercial sex of this type. For all these reasons the expansion of tourism requires close monitoring for its impact on commercial sex and through it for the spread of STD and HIV/AIDS.

**Main Health-Related Responsibilities of the Tourist Sector**

The main health related problems and issues in the tourist sector and the agencies responsible are given below

*Environmental Pollution*

(i) the health impacts of environmental pollution arising from the beach resorts

(ii) Surveillance of the hotel industry

(iii) Regulations relating to location, sewage discharge and garbage disposal

the agencies responsible are

The Tourist Board
The Central Environment Authority
Coast Conservation Department
The Health Ministry
Local Government Authorities
The Hotels
NGOs and community organisations

Commercial Sex, STD and AIDS

(i) Control and Surveillance of STD
(ii) Control and Surveillance of HIV/AIDS
(iii) Sentinel Surveillance of STD and HIV/AIDS in tourist locations
(iv) Surveillance of prostitution
   - child prostitution
   - homosexual prostitution

Main agencies responsible are
- Health Ministry
  - STD control programme
  - sentinel surveillance of HIV/AIDS
- Tourist Board
- Police Department
- NGOs and community organisations
  - NGO Forum for Children's Rights
- Media

Institutional and Legal Framework

Health Accountability for Environmental Pollution in the Tourist Sector

There is at present a legal and regulatory framework for the hotel industry which relates to location, sewage and waste disposal which is enforced by the Tourist Board, the CEA, the Coastal Conservation Department and the local authorities. The co-ordination among these agencies is not adequate to ensure regular and systematic surveillance monitoring and enforcement. The NGOs in the environmental field have shown capacity for effective intervention and need to be supported and brought into closer partnership for surveillance of the environmental and health impact of the hotel industry. NGOs have access to information at the stage of EIAs but the access to regular information for greater monitoring and surveillance is limited.

Accountability for the Impacts of Tourism on Commercial Sex and spread of STD and HIV/AIDS

The institutional and legal framework to deal with this area includes the Health Ministry’s programmes specially entrusted with responsibility for control of STD and HIV/AIDS, the Tourist Board for hotel supervision, the Department of Probation and Child Care and the Police Department and Judiciary. The existing legislation relating to commercial sex and violation of children's rights is being revised and strengthened for better protection of
children's rights. The institutions that have been established following Sri Lanka's ratification of the convention of children's rights and the accompanying legislation are powerful instruments for dealing with some of the problems of child prostitution associated with tourism. The NGO Forum for Children's rights harnesses the efforts of the NGOs in the field. Some of the negative impacts of tourism such as pedophilic offences have evoked strong protests and reactions from local communities.

The System of Health Accountability in the Tourist Sector

The system of health accountability in the Tourist sector would have to be organised around the two clusters that have been described in the section on functions and the responsible agencies. Each cluster would need to be specifically mandated to monitor the health problems and issues that have been identified. The two clusters would have to be co-ordinated within the tourist sector and this co-ordinating body which is responsible for the surveillance of health impacts in the tourist sector could be brought as a sectoral committee under the National Health Council in the same manner as in the other sectors such as industry and agriculture and food.

(vi) Accountability for Health Information and Knowledge to the Public

Introduction

The preceding sections demonstrate how health hazards multiply as development takes place. Correspondingly the knowledge and information that people need for healthy living becomes more extensive and complex. The access to information which the public requires on all matters which affect the health of the population becomes more important for the participation of citizens and NGOs in protecting the environment for health and improving the capacity of people for healthy living. The health information and knowledge needed extends to all aspects of life and behavior.

Most health care systems have developed the capacity for health education information of the public which cover the areas which have had high priority in the past. These include primary health care covering safe water and sanitation, food and nutrition, immunisation, maternal and child care and major diseases. Where they are often deficient is in the problems of the health transition which developing countries are undergoing. These include the systematic collection and dissemination of information on the health hazards of development activities, the health problems that acquire priority with demographic changes such as non-communicable diseases and the degenerative diseases of aging, women's health and new diseases such as HIV/AIDS. There are also two other important dimensions which change the orientation and focus of health education. These are first the increasing literacy and educational levels of the population and the growing capacity for self care and second the active participation of civil society through NGOs, people’s organisations and the media in protecting and promoting the health of the people. The health education system has to be extended and shaped to respond to all these challenges. The accountability for health education of this type involves a large number of major actors and requires a process of inter-sectoral partnership and co-ordination much more complex than was necessary in the past.
Sri Lanka has had a long tradition of health education in the main areas mentioned above. Without an extensive and effective programme of health education Sri Lanka would not have been able to achieve the social indicators which are exceptional for a low income country. The health education system at present focuses on the areas in which risks to health risks are serious and most common. The system is beginning to address new areas such as AIDS, smoking and drugs. In a changing context in which the individual, the household and the community will play an increasingly important role in preventive and curative health care, health education would have to receive much higher priority and would have to be re-oriented to meet the new challenges. The section that follows examines the problems and issues of health education from this perspective. It therefore focuses on the need for health education in the areas which have been selected for this study and which need to be incorporated in a comprehensive system of accountability for health.

Supply of Health Information and Knowledge to the Public - Current Status

The agencies directly responsible for health care - the health Ministry and its organs are at present the main instruments for the dissemination of information and health education. The main activities that are undertaken and which are reported regularly in the Health Ministry’s Annual Health Bulletin are the following:

School Health Education which includes health exhibitions, training for teaching staff, school health clubs, poster and essay competitions, Seminars on current problems

Special Campaigns such as those for acute respiratory diseases, HIV/AIDS supported by health education materials on early detection of symptoms and preventive and curative health care.

Mass media and popular publications

There is at present no systematic effort at identifying the needs in health education relating to all important health problems in the various sectors and developing a co-ordinated strategy for the health education of the people and NGOs. The efforts at the education of the public on health risks in the sectors examined above are undertaken in an ad hoc manner by different agencies at different times.

Health Education relating to Environmental Pollution in Industry, Agriculture Transport and Tourism

In the areas of environmental pollution that have been discussed in the preceding section, the information regarding health risks reaches in piecemeal fashion. The problems of environmental pollution relating to all these sectors reach the public through the media and publicised information available on large projects which are subject to EIAs. In the case of environmental pollution and health hazards relating to the use of fertiliser and pesticides, the information is available through micro studies done at different times. There is no regular process of collecting data on environmental pollution in relation to locations or publication of information through regular news bulletins and releases. NGOs who are active in the field have to devote much time and resources for the collection of the data and often do not have
free access to the information from firms. There is also no documentation for ready reference available to the public on identified health risks.

**Occupational Health**

The Division for Occupational Hygiene is responsible for the component in health education relating to occupational health. Full information on occupational health hazards and the essential precautions is seldom available to workers and trade unions. For a systematic process of health education in occupational health a more effective system for collecting information on ill health associated with occupations would have to be implemented. This has to be supported by a more comprehensive surveillance research and investigation of occupational health than is operative at present. The information from developed countries in relation to the occupational health problems of the industries established in Sri Lanka should be systematically collected and available to firms and workers to enable them to exercise effective vigilance and take adequate precautions.

The need for education in occupational health is critical for the health of workers in small and medium scale enterprises and in the informal sector. As yet little has been done to reach out to this sector.

The occupational and household hazards of the use of agro-chemicals and pesticides has been receiving the attention of the state authorities. There is however no readily available source of information such as a handbook which provides all the information necessary on the products which are in the market. The firms provide some of the information regarding the precautions to be taken in the case of specific products. New products are regularly entering the market with widely varying levels of toxicity. The labels and literature provided with products are often in very small print and the precautions to be taken are not adequately highlighted. There are no surveys which have ascertained the level of awareness and knowledge of the users and the care usually exercised by them.

**Quality Assurance in Food**

This sub-section deals with health education of the public and information in regard to the quality of food. Nutrition is dealt with in the sub-section which follows.

At present labelling of products is the main source of the information to the consumer on the quality of the product that is marketed. The labels are required to carry essential information including the expiry date, the price, the weight and volume the composition of the product in terms of the ingredients that have gone into it and their quantities, and instructions for preservation and preparation. Although there is legal provision requiring the firms to provide most of this information not all comply. Most local products do not carry adequate information on the composition of the product, preservatives used. Labelling on the nutritional composition is not compulsory and most products do not contain the required data and information.

Apart from labelling there are no regular means of educating and informing the public on the quality of food to enable them to exercise care in the choice of the food. Information on such matters as the toxic or carcinogenic effects of certain foods are provided in an ad hoc manner.
in the media but is not available readily in documentation. Products are approved for quality by the Standards Bureau which authorises such approved products to carry the Sri Lanka Standard (SLS) mark on their labels. There are as yet no consumer associations which survey the market and provide regular guidance to the consumer on such matters as quality and price. Nor is their regular published information on the quality and health effects of new food products, fast food and food available in the catering industry. The existing consumer associations are not adequately equipped with the human and financial resources to undertake such tasks and disseminate the information through a regular news bulletin.

Many aspects of food quality assurance would be looked after through the normal processes of an efficiently functioning competitive market. In such a market firms will compete with each other to provide the food quality assurance which will attract consumers and enlarge their market share. This requires critically discerning consumers who know what to look for even in the labelling and with adequate information and health knowledge to make their choices. This critical input has to be provided by public agencies and vigilant consumer associations.

Advertisements are the other popular source of information of products to the public. In selected areas there are restrictions on advertising and screening of advertisements as in the case of pharmaceuticals tobacco and liquor. There is however no comprehensive policy for surveillance of advertisements nor are there voluntary codes which have been agreed upon and made public to prevent undesirable practices which can misinform the public. There has been some public criticism of advertisements on the widespread use of children and the mother-child theme to popularise infant milk foods and a variety of other food products.

**Nutrition**

There is a considerable flow of information on nutrition from various sources such as the Division on Health Education, Medical Research Institute. Professionals who contribute to the media on nutrition-related subjects. Most food items have been analysed for their nutrition content. Much of this information is disseminated to the public in news bulletins and publications produced by the Health Education Division. More detailed information on nutrition and food is available in institutions such as the MRI and are made use of in analytical work and studies by nutritionists. The present study however does not deal with the main field of nutrition. It focuses on the agriculture nutrition interface.

The information and knowledge on the agriculture-nutrition interface includes nutritional aspects of food processing, milling, storage of agricultural produce, and pesticide residues and crop diversification for improvement of nutrition. The information and knowledge on these matters at present are not appropriately packaged and adequately disseminated among the parties involved. The information and knowledge must reach farmers, millers retail distributors and consumers. In areas such as milling to preserve nutritional quality and crop diversification the efforts needed go beyond dissemination of information and knowledge. The efforts need to be linked to extension services and technical and other forms of assistance for upgrading of the technology.
Livestock

The information and education regarding the health hazards of livestock industry is not a clearly identified responsibility of any agency it is subsumed in the activities of the public health programmes of the Health Ministry, the Livestock Department, the regulatory responsibilities of the local government authorities and the tasks of the agencies dealing with food control and quality assurance in food.

As lifestyles change and consumption of meat and other products of the livestock industry increase the health effects of livestock products will acquire increasing importance. The health education and information programme in this area would have to be more effectively organised and would need to involve livestock farmers, local authorities, processors and consumers.

Pharmaceuticals

Public education on drug use is very essential people may lack skills and knowledge to make informed decisions about how to use drugs and to understand the role of drugs. Patients often take drugs in the wrong way, either reducing the dose to make the treatment last longer or increasing it in the hope of a quicker cure. They may either take drugs at wrong times or forget to take a dose. At times patients on long courses of drug treatment do not take the whole course.

The "Sepatha" published by the Health Education Bureau, media programmes and publications in the print media are some sources where the public become aware of drugs. Although it is the medical doctor who prescribes, pharmacists dispensers etc. who handle drugs are expected to provide rational information about drugs to patients this aspect has not been evaluated.

Sri Lanka has not published a book on drug information to patients. However in most hospitals and field clinics health education talks given by health workers touch upon this subject.

The mass media promotion of drug advertisements, widespread availability of drug sales outlets, easy access to over the counter drugs as well as some essential drugs and the high literacy level of the population favour self medication in Sri Lanka and therefore self-medication is increasing.

In self medication there is individual accountability for the outcome of the illness. If practiced with a sense of clear and prudent understanding of the ailment, economy in the use of drugs, ease and convenience are some benefits to the patients.

For self medication to be cost-effective and safe, unbiased information about health, diseases and drugs should be available. Self-medication mainly depends on over-the-counter drugs, which are aimed at curing an array of aches, pains, discomforts and benign illnesses. In a number of developing countries, however, many essential drugs are dispensed over the counter without medical supervision. In self medication patients often seek the advice of pharmacists. Not all pharmacies have the capacity to provide the correct advice in situations
requiring simple preventive or curative responses. In a survey undertaken to assess the performance of pharmacies, only 16 out of 25 pharmacies in Sri Lanka gave appropriate advice - oral rehydration or consultation with a health worker, to the presentation of a fictitious infant with diarrhoea.

A student organization named Students Involved in Rational Health Activities (SIRHA) and a NGO - Organization to Safeguard Life and Environment (OSLEN) in Sri Lanka are active for consumer protection. RDU and drug information are some key interests of these organizations.

An effective programme of public education in the rational use of drugs and self-medication requires the co-operation of medical practitioners, pharmacists NGOs and patients. The primary responsibility for such a programme devolves on the Health Education Bureau.

Health Impacts of Transport - Accidents

At present the information to and education of the public on prevention of accidents and road safety is the responsibility of the Traffic Division of the Police Department. The schools, NGOs the Transport Ministry, the Highways Ministry and the media participate in this activity. The warning signs and notices informing drivers of accident-prone areas such as bends and inclines and directions on speed limits are normally provided but there is room for considerable improvement both in regard to the coverage of all locations as well as display. Programmes and publicity campaigns which are more effective as well as educative of both pedestrians and drivers are needed.

Health Impacts of Tourism

The information and education on environmental impacts of tourism is covered in the subsection which has already dealt with this subject above. Health education on STD and HIV/AIDS is the responsibility of the Health Ministry's Health Education Bureau in association with the control programmes. Further public education and information on the hazards such as youth and child prostitution associated with tourism are undertaken by concerned NGOs working in association with the Tourist Department, the Police Department and the media. These activities could be further strengthened by fuller information by the relevant authorities to the public and the NGOs.

The System of Accountability for the Supply of Health-related Knowledge and Information

The system of accountability on the supply of health-related information in the areas selected for the study could be initially organised around the cluster of activities and the agencies that have been identified under each sector. The component on information and education would have to be developed as an integral part of the responsibilities of each cluster, and would have to be incorporated in the activities of the Health Education Bureau. The Bureau would need to work in close collaboration with the other agencies which implement the programmes and reach out directly to the population groups and clientele in each programme such as the Labour Ministry and the Division of Occupational Hygiene in the case of occupational health.
agricultural extension workers in the case of fertiliser and pesticide use or the Tourist Board and agencies administering the Children’s Rights Convention in the case of STD HIV/AIDS and child prostitution.

The accountability of these clusters for the assigned functions would need to be ensured through a monitoring procedure with a periodic review of performance in the sectoral committees working under the National Health Council as described above. A set of indicators for the availability of health information and knowledge would have to be developed to render the system of accountability and the monitoring process effective.

(vii) The Accountability for the Health Impact of Macro-economic Policies and Development Strategies

At present there is no clear definition and assignment of responsibility for the analysis of health impacts of macro-economic policies and development strategies. These impacts could be of a direct nature such as taxes and tariffs on commodities and services that are needed in the provision of health care, the health impact of new projects, subsidies on health goods and services, the allocation of resources to the health sector, through the government budget and policies relating to the private sector in health. The indirect effects extend throughout the economy and include all policies and interventions which affect the health of the population. Of these the most important would be the policies directed at poverty alleviation. The impact of poverty alleviation on health would be through increases in the purchasing power of the poorest households better nutrition and better access to safe water sanitation and health care.

There has been no attempt to undertake an in-depth analysis of the impact of current macro-economic policies on health. The policies of liberalisation led to the reduction of the rice subsidy and subsidies on a wide range of goods and services. Despite the targeting of the subsidies to the lower income groups there is evidence that the immediate impact of liberalisation was detrimental to the lowest three income deciles. The indicators relating to health status however indicate continued improvement in the rate of infant mortality and life expectancy. There has also been a reduction in the level of absolute poverty and some improvement in the nutritional status in the period 1985-1990.

The general policy on tariffs and indirect taxes is to include the commodities needed in health such as pharmaceuticals, medical equipment and food in the lowest band. However there has been no specific analysis of existing tariffs and indirect taxes to examine their incidence on health goods and services.

The macro-economic constraints on government budgetary resources and the ceilings imposed on budget deficits as part of the stabilisation policies have affected all sectors including health. The government expenditure on health as a percentage of GDP has declined. Government policy on health expenditures has been influenced by two conflicting objectives - On the one hand the objectives within the sector are directed at improving the quality of health care provided by government institutions and on the other at the macro-economic level efforts are directed at containing the cost of welfare including free health services. Although there has been some examination of the possibility of cost recovery for health services provided to those who can afford to pay this has not been pursued.
The national policy for monitoring the health impact of development projects is at present subsumed under policies for environmental protection. The health impact analysis is part of the EIA. The present study addresses this problem in selected sectors. Projects which have no major environmental externalities may still have serious health hazards. Therefore the national policy for health impact analysis the areas where it must apply and the policies and procedures for ensuring that all important projects and programmes undergo close evaluation and scrutiny would have to be more clearly articulated. The health component of the EIA should be clearly distinguished and monitored by the National Health Council.

Initially the national health policy could focus on the four elements described above. These are

- tariffs and indirect taxes on health goods and services,
- the impact of stabilisation and structural adjustment on the health budget and the allocation of budgetary resources for health,
- national policy on health impact analysis and
- the focus on health in poverty alleviation.

The agencies responsible for these tasks will be the Ministry of Policy Planning, the Ministry of Finance, the Ministry of Health and the Ministry in charge of Poverty alleviation programmes. These four supported by the relevant organs within the Ministries could form the group responsible for evaluating and analysing the health impact of macro-economic, fiscal and development policies and could function as one other committee under the National Health Council.

3. THE MAIN ELEMENTS OF A NATIONAL SYSTEM OF HEALTH ACCOUNTABILITY

The present study has examined the needs for health accountability in seven selected areas. At this point it has to be re-emphasised that the purpose of the study is to focus on the health problems and issues that arise in sectors outside the purview of the agencies that are directly responsible for providing health care services, preventive and curative. The study has argued that in a national health system a clearly defined system of responsibility and accountability for these health problems and issues which are not identified and monitored under the prevailing health care system is critically important for a variety of reasons. These problems are part of the health transition that is taking place in developing countries and will assume increasing importance in the future.

At the same time it should be noted that the national system of health accountability in its entirety will encompass many more vitally important elements than those identified in the seven sectors. The Health Ministry and its agencies will have overall accountability for the quality of health care services of the government sector; the state will also be responsible for regulation and surveillance of the private sector services. The professional ethics governing medical practice and relations between patients and health care providers will be the responsibility of the professional associations and the Health Ministry. There is a legal framework to deal with the consequences of negligence and malpractice. This major part of
the health accountability system is taken as given for the purposes of the study. The strengthening and improvement of this part requires separate study and analysis.

The present study identifies those elements in sectors outside the health services which need to be incorporated in the national system. The main elements of this part will constitute the system of health accountability depicted in the diagram that is presented below. The system identifies the seven components in terms of the main responsibilities and the agencies and defines its linkage to the national body. Each of these components will have main functions in relation to the area of responsibility assigned it:

* Designing and operation of the information system for surveillance and collection of relevant information
* Development of Indicators for the information system
* Monitoring
* Evaluation
* Periodic preparation of Status Reports and their submission to the national body

At present the Ministry of Health produces the Annual Health Bulletin. This could be further developed into a fuller Health Status Report which can incorporate the component on health accountability in development.

The system of health accountability requires the close collaboration and partnership among four main groups of actors - the state agencies, the constituent units of the private sector directly involved in the relevant activities, the NGOs including the media and the research community. In each area this partnership would be essential to maintain an effective system of health accountability. The institutional framework in each area would have to include the main representatives of these four constituencies.
Insert the chart HEALACC1.CHP & HEALACC2.CHP from Ventura.
4. THE REGIONAL AND INTERNATIONAL ASPECTS OF HEALTH ACCOUNTABILITY

The Regional Aspects

The WHO regional organisation and other intergovernmental bodies at the regional level can play an important supportive role in promoting and strengthening the systems of accountability for health at the country level. In the SEARO region in particular the varying levels of industrialisation would yield country experiences and national responses to emerging health hazards that would be a valuable source for exchange and sharing of knowledge. In South Asia the major changes in economic policies in the direction of the market and the accompanying structural adjustments are imposing fiscal constraints which affect the allocation of government resources to the health sector. The trend towards privatisation and the expansion of the private sector in health require major adjustments in national health policies. The initiatives at the regional level in the area of health accountability can take several forms.

First the WHO regional organisation can build up a data bank and a body of information relating to the experience of the region on health risks arising out of development activities and the areas selected for the study.

The regional organisation could also implement a system of sentinel surveillance in the region to identify the most pressing health problems that are emerging from development activities in the region and provide appropriate technical assistance to deal with them.

A programme of technical co-operation can be organised to promote the exchange of knowledge and information relating to problems of health accountability and the nature of the responses made by different countries of the region. On the basis of such exchange the region could develop models of health accountability which could be followed by countries.

The WHO regional organisation could collaborate with other inter-governmental organisations and lending agencies active in the region to develop appropriate policy responses and interventions for protecting the health of the population and meeting health needs in the process of liberalisation and privatisation. Existing experiments in this field such as those in Latin America and Sub Saharan Africa could be adapted to the situations in South Asia.

International

At the international level, several supportive measures can be taken for strengthening health accountability in development. Some of the main initiatives that are possible are listed below.

The sentinel surveillance that is suggested at the regional level could be co-ordinated at the global level and information and data could be collected and systematised for transmission and exchange across regions. This sentinel surveillance could be developed in the form of a World Health Watch.

Systems of information could be developed to transmit to developing countries the information and knowledge that becomes available in developed countries regarding harmful
health effects of existing and new products. These could cover problems in the field of occupational hygiene, long term adverse effects of industrial products, food products and pharmaceuticals that are discovered in the process of use as well as research and investigation in developed countries.

International conventions could be developed to ensure that countries maintain and apply adequate health standards and controls to all products that are internationally traded. For example, products that are banned for health reasons in any given country or which are detected to have adverse health effects should not be freely exported to other countries. Fuller use and more effective implementation of the WHO Certification Scheme on the Quality of Pharmaceutical Products moving in International Commerce should be promoted.

Agreement should be sought from International lending agencies and donors to make health impact analysis (HIA) a prerequisite for programmes and projects which are financed by them. The HIA should not be undertaken only as part of the environmental impact analysis but should have an independent and special status in project evaluation. The methodologies of HIA should be further developed by WHO and made available to other agencies and to countries.

Work already done to ensure that health implications are taken into account in programmes of structural adjustment and macro-economic policy reforms promoted by international agencies should be taken further. The policy responses that have been effectively developed by various countries to take account of health during economic reform and structural adjustment should be more widely disseminated in partnership with international lending agencies to provide guidance to developing countries.
3. Age-Specific Mortality Rates

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<tr>
<td>40-44</td>
<td>20.5</td>
<td>20.4</td>
<td>11.8</td>
<td>11.9</td>
<td>4.8</td>
<td>5.3</td>
</tr>
</tbody>
</table>

Source: Population of Sri Lanka, Country Monograph Series No. 4. ESCAP.

4. Literacy Rate of Population Age 5+ (1911-1953)

<table>
<thead>
<tr>
<th>Year</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1911</td>
<td>47.2</td>
<td>12.5</td>
<td>30.9</td>
</tr>
<tr>
<td>1921</td>
<td>56.3</td>
<td>21.2</td>
<td>39.9</td>
</tr>
<tr>
<td>1946</td>
<td>70.1</td>
<td>43.8</td>
<td>57.8</td>
</tr>
<tr>
<td>1953</td>
<td>75.9</td>
<td>53.6</td>
<td>65.4</td>
</tr>
</tbody>
</table>

Source: An Export Economy in transition - D.R. Snodgrass

5. Total School Enrolment 1901-1953

<table>
<thead>
<tr>
<th>Year</th>
<th>Number '000</th>
<th>Total as % of pop. 5-14</th>
</tr>
</thead>
<tbody>
<tr>
<td>1901</td>
<td>218.5</td>
<td>25.2</td>
</tr>
<tr>
<td>1911</td>
<td>359.7</td>
<td>33.6</td>
</tr>
<tr>
<td>1921</td>
<td>404.4</td>
<td>35.8</td>
</tr>
<tr>
<td>1946</td>
<td>943.2</td>
<td>58.3</td>
</tr>
<tr>
<td>1953</td>
<td>1578.3</td>
<td>78.7</td>
</tr>
</tbody>
</table>
## Health Indicators 1911-1950

### 1. Mortality rates for Quinquennial Periods from 1911-1950

<table>
<thead>
<tr>
<th>Year</th>
<th>Average Infant Mortality Rate</th>
<th>Average Death Rate</th>
<th>Maternal Mortality Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1911-15</td>
<td>201</td>
<td>30.6</td>
<td></td>
</tr>
<tr>
<td>1916-20</td>
<td>190</td>
<td>30.1</td>
<td></td>
</tr>
<tr>
<td>1921-25</td>
<td>190</td>
<td>27.8</td>
<td>19.8</td>
</tr>
<tr>
<td>1926-30</td>
<td>175</td>
<td>25.1</td>
<td></td>
</tr>
<tr>
<td>1931-35</td>
<td>183</td>
<td>24.6</td>
<td>20.1</td>
</tr>
<tr>
<td>1936-40</td>
<td>160</td>
<td>21.4</td>
<td></td>
</tr>
<tr>
<td>1941-45</td>
<td>131</td>
<td>19.9</td>
<td>12.0</td>
</tr>
<tr>
<td>1946-50</td>
<td>101</td>
<td>14.3</td>
<td></td>
</tr>
</tbody>
</table>

Source: Population of Sri Lanka, Country Monograph Series No. 4. ESCAP.

### 2. Life Expectancy at Birth

<table>
<thead>
<tr>
<th>Year</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>1921</td>
<td>32.6</td>
<td>30.6</td>
</tr>
<tr>
<td>1946</td>
<td>43.8</td>
<td>41.5</td>
</tr>
<tr>
<td>1953</td>
<td>57.8</td>
<td>55.7</td>
</tr>
</tbody>
</table>

Source: Population of Sri Lanka, Country Monograph Series No. 4. ESCAP.
6. Social Service Expenditure as % of Total Government Budget

<table>
<thead>
<tr>
<th>Year</th>
<th>(1) Social Services (Health &amp; Education)</th>
<th>(2) Total Govt. Expenditure</th>
<th>(1) As % of (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1928/29</td>
<td>21.9</td>
<td>144</td>
<td>15.2</td>
</tr>
<tr>
<td>1947/48</td>
<td>147.2</td>
<td>592</td>
<td>24.8</td>
</tr>
<tr>
<td>1953/54</td>
<td>289.4</td>
<td>929.8</td>
<td>31.2</td>
</tr>
</tbody>
</table>