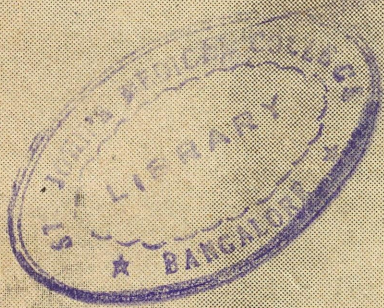


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## OBJECTIVES

*Swasth Hind* (Healthy India) is a monthly journal published by the Central Health Education Bureau, Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India, New Delhi. Some of its important objectives and aims are to:

**REPORT** and interpret the policies; plans, programmes and achievements of the Union Ministry of Health and Family Welfare.

**ACT** as a medium of exchange of information on health activities of the Central and State Health Organizations.

**FOCUS** attention on the major public health problems in India and to report on the latest trends in public health.

**KEEP** in touch with health and welfare workers and agencies in India and abroad.

**REPORT** on important seminars, conferences, discussions, etc., on health topics.

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## ECOLOGY AND HEALTH

DR. B. N. GHOSH

The exact impact on health, resulting from environmental change may be correctly assessed only by careful experimental epidemiological studies. But it has become increasingly clear in recent years, that environmental degradation, if allowed to proceed unchecked, could result in serious and sometimes irreversible damage to life on this planet.

**E**COLOGY is that biologic discipline which has to do with mutual relationship of various living organisms in an environment, and their reaction to animate and inanimate surroundings. In short, it is the influence of the total environment on the behaviour, health and wellbeing of living things. The ecological system is always a dynamic one, tending towards a state of balance or equilibrium but not attaining it. The ultimate state of equilibrium is known as the climax state. Ecology is rapidly developing into a quantitative science with predictive potential.

The study of ecology or, bionomics, as it is sometimes called is one of the branches of biology. Ecology has numerous practical applications in the health of the people. It is concerned with conservation and investigation of all natural resources, whether they are soil, minerals, oil, gas or water, or plants, man or other animals.

Theoretically, overall development should lead to progress and an improved quality of life; however, there are some negative effects. In many parts of the world, social and economic development has resulted in unregulated growth and the creation of vast urban and industrial complexes, that pollute the atmosphere and affect the health of the people. One of the striking changes in the ecology of man has been the growth of cities. The resulting overcrowding and squalor in parts of some industrial cities have profoundly affected the psychosocial foundations of society contributing increase in disease, crime, alcoholism, etc.

### **Conflicts**

Conflicts arise between the desired development and the preservation of environmental quality. These conflicts may arise in number of situations as between the need to use pesticides for food production and the need to protect natural resources and the community from the harmful effects.

Poor sanitary conditions and the accompanying communicable diseases are the greatest cause of morbidity and mortality in the developing countries where the majority of the world's people live. Such conditions are characterised by water supplies that are inadequate both in quality and quantity, poor or non-existent waste disposal system, abundant animal and insect reservoirs and vectors of disease agents and insufficient health education, to which is often added the resistance sapping factor of malnutrition.

These conditions have been largely eliminated in the economically advanced and industrialised countries, but other environmental hazards to human health often exert their effect more subtly than do communicable diseases, and take their toll in both industrialised and developing countries. They include physical and chemical factors and psychosocial influences, and together with microbiological agents, they make up the part of the ecosystem most directly affecting man's health.

Quality of water may be degraded by various pollutants, starting, from biological to various physical and chemical agents.

### **Biological Contaminants**

Biological contaminants mostly affect after ingestion of the contaminated water and result in different bacterial, viral, protozoal, helminthic infections and infestations. India loses 73 million man-days a year as a consequence to water-borne diseases. Diarrhoea is by far the major killer of children in the developing world—being responsible for 4 to 5 million childhood deaths per year or 1 death every 5 to 10 seconds. In India alone, 1.5 million children die annually from diarrhoea. Besides these direct effects, water also helps in breeding of different vectors and thereby help in those water-borne diseases ranging from malaria, filaria, guineaworm. About 12.6 million people in 11,736 villages in 82 districts of Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Tamil Nadu are at risk from guineaworm infection. Presence of naturally occurring chemicals also make water unsafe for human consumption. Systematic hydro-geological surveys made by the Central Ground Water Board have shown that fluoride bearing waters are widespread in 10 States in India—Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Kerala, Punjab, Rajasthan, Tamil Nadu and Uttar Pradesh.

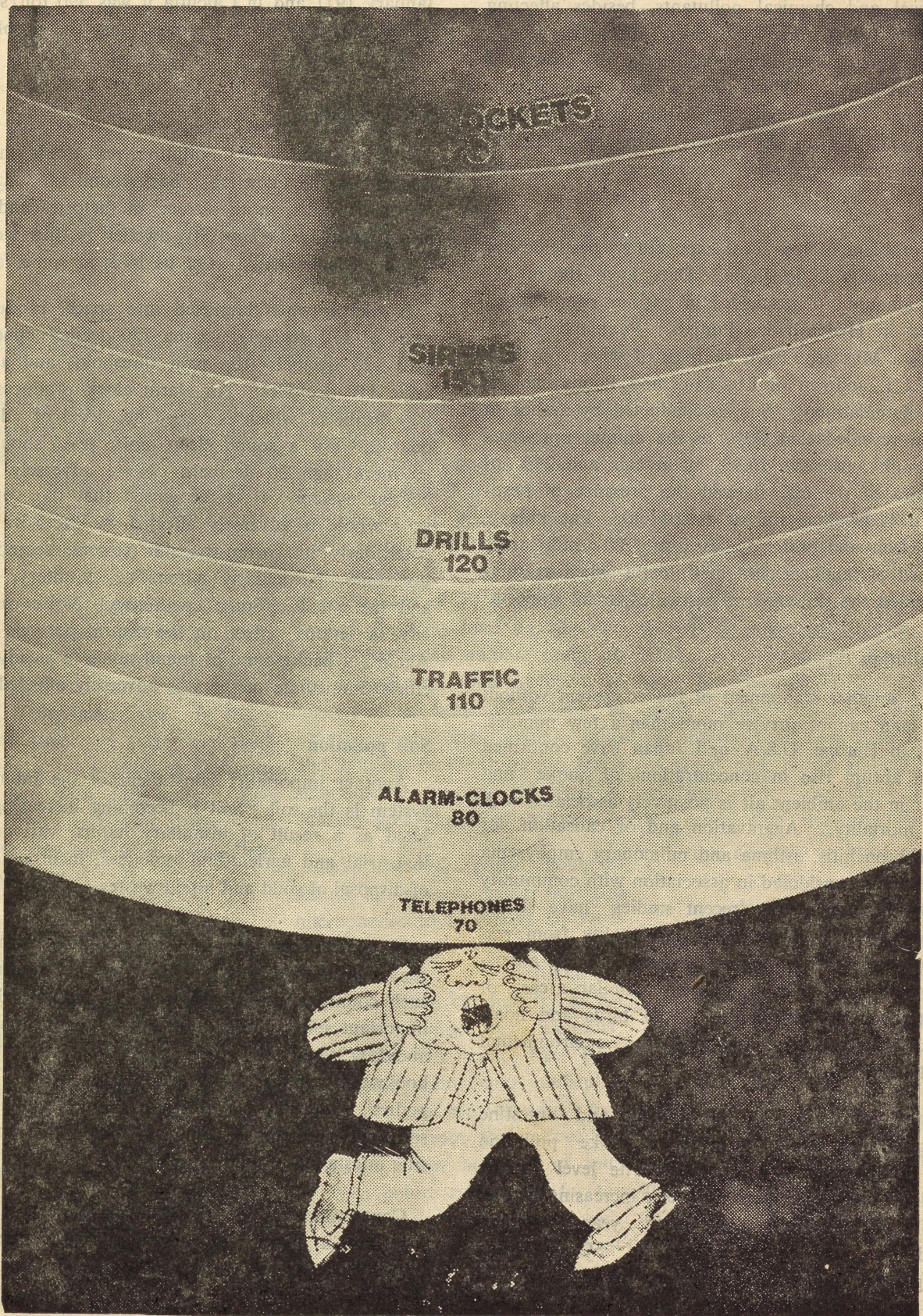
### **Man-made pollutants**

Oil fouls the shoreline. The most productive and potentially useful areas of the sea are in the vicinity of coastlines with the greatest human activity. They are thus the most susceptible to destruction by man made pollutants. Pollution of River Ganga is another extreme example in India.

---

*The decibel hell: The extreme limit of human noise is 140 decibels, and the pain threshold 120 decibels.* →

(Source—World Health, May 1972)



Physical and chemical pollutants, besides affecting the potability of water, adversely affect the growth of useful aquatic species and also harm the growth of vegetations nearby. These physical and chemical contamination of water and vegetation is totally man-made, either due to discharging untreated industrial wastes in water or due to unregulated uses of pesticides.

The problem of low level exposure to pesticide appears considerable in India. Data have shown excessive amount of pesticides in various commodities analysed in Hyderabad, Punjab, Pantnagar (U.P.), Delhi and Mysore. Even samples of wheat obtained from F.C.I. godown of Ludhiana and Poona showed excess of malathion<sup>1</sup>. Survey conducted by author in Calcutta revealed that 30% of the animal products (meat, milk and fish), 26.3% of cereals and 24% of vegetables of the city showed the presence of pesticide (DDT, Lindane and/or malathion).<sup>2</sup> Fat, kidney, liver, spleen and brain tissues from 100 individuals who died of fatal accident in Calcutta, when examined revealed the presence of pesticides in 27 subjects.<sup>3</sup>

#### **Air Pollution**

Air is another component of the ecosystem without which man cannot survive more than a few minutes. Studies in Europe, U.S.A. and Japan have confirmed that an abrupt rise in concentrations of smoke and sulphur in the ambient air is positively associated with excess mortality.<sup>4</sup> Aggravation and/or causation of chronic bronchitis, asthma and pulmonary emphysema have all been considered in association with community air pollution. Several recent studies have shown that both overall mortality and mortality from respiratory diseases are higher in areas of high atmospheric pollution than in otherwise similar areas of low atmospheric pollution<sup>5,6</sup>. Dead birds and floating fish have come to symbolize the environmental hazards that surround us.

Deaths from cancer of the stomach and intestine are significantly related to levels of smoke pollution in 30 English country boroughs.<sup>7</sup> The level of air pollution in our big cities has been increasing at an alarming rate—perhaps 10% each year. A study carried out recorded the level of SO<sub>2</sub> in air as 271/mg/m<sup>3</sup> in Calcutta and 0.223/mg/m<sup>3</sup> in Delhi while in the U.S.A. it is not allowed to exceed 0.1/mg/m<sup>3</sup>. The dust fall in Delhi was 811 tons/sq. mile in

January 1971 and in Calcutta it was 590 ton/sq. mile in December 1970. It proves that the problem is already home.

#### **Noise pollution**

Of all forms of pollution, no doubt the most insistent is the constant background of aggressive noise in airport, in the street, in factories and even inside buildings. The city dweller is thus subjected to "the decibel hell". Let us look at some facts.

A rocket, when launched into space, produces a noise of 170 decibels, a siren 150 decibels, pneumatic drill 120 decibels (the pain threshold) and a motor cycle 110 decibels. An alarm clock produces about 80 decibels, which is also the level of domestic quarrel. For a sound sleep, noise level should not go more than 30 decibels. Noise adversely affects hearing system. It is recognised that the organism as a whole is adversely affected by excessive noise particularly its cardio-vascular system, secretion of hormones, particularly adrenaline, pituitary, thyroid and the gonads ("Sonic" pathology). Noise can also have a serious effect on the central nervous system. Against a background of found noise (a steady 85 decibels) immediate memory is adversely affected.

#### **Soil pollution**

Another important constituent of the human ecosystem is the soil. Soil is becoming increasingly polluted as a result of insanitary habits, various faulty industrial and agricultural practices, incorrect method of disposal of soil and liquid wastes.

In developing countries, soil pollution with pathogenic micro-organisms is still of major importance. In such countries, intestinal parasites constitute the most important soil pollution problem. It is estimated that about 1/3rd of the world's population is infected with hookworm whereas 1/4th are infected with *A. lumbricoides*<sup>8,9</sup>. Vegetables grown on these contaminated soil are very common source of helminthic and parasitic infestation of man.

Contaminated soil also plays an important role in spreading a number of zoonotic diseases like leptospirosis, anthrax, Q. fever, and cutaneous larva migrans.

*(Contd on Page 134)*

## SOUND AND FURY

UNSEEN, and generally unrecognized, noise has become a pollutant and a nuisance. Overall noise in urban conglomerates is doubling in every ten years.

Studies conducted in major cities of the world show that more than 70 per cent of neuroses is caused by airport noise and traffic howl. Overexposure to such sounds damages ears and can result in deafness. Noisy machinery in factories and mines can make men deaf. Animals are known to migrate from dam sites and bridge sites where iron monsters clatter and clamour day and night doing their assigned jobs.

That noise can wreak destruction is an age-old theory now being proved true. The *Bible* says that the sound of bugles can raze a fortress to dust. Lord Krishna sounded his *Panchajanya* to paralyse the furious court of Suyodhana. Even now, soldiers break step when they march across a bridge. In fact, sound is like a knife in the hands of a surgeon it heals, a killer uses it to kill.

Scientists engaged in the study of this disastrous problem have made a fine distinction between

sound and noise. Noise is an unacceptable level of sound according to them. Sound is a form of energy measured in units called decibels (dB). It is a unit for measuring relative loudness of sound. The decibel scale is logarithmic. A noise level of 90 decibels would be ten times as loud as 80. Normally, the lowest audible sound on the scale forms one decibel, the highest in the scale being 130. In heavy engineering, textile mills and bottling factories noise levels sometimes go up to 115 decibels, causing great harm to workers.

Take a bridal party going to attend a marriage using powerful microphones to broadcast all types of music at night with bands, bugles and drums in a peaceful neighbourhood where children try to get ready for the next day's examinations, where sick babies have been put to sleep with great difficulty, where men and women who had rushed back from their office try to snatch a few moments of restful sleep before rushing off for tomorrow's work. Who enjoys such 'music'? Not even the signers. Probably the fiery water in them boils over. Or take a religious function in a home or a place of worship.

Industry, airports and social marvericks are not the only ones to blame. In homesteads too this unseen danger lurks. Dishwashers, vacuum cleaners, blenders, lawn mowers and even air-conditioners produce noise more than 93 decibels. [One of the most unexpected source of noise pollution is rock music in a discotheque, where noise level goes beyond 110 decibels. A study conducted in Leeds Polytechnic showed that more than 10 lakh teenaged rock music addicts suffered from some degree of hearing loss and other impairments.]

In our country we burst crackers for every occasion. Apart from fire hazards, it can create hearing and mental disorders even in children.

At 0 decibel nothing can be heard. Up to 20 decibels sound won't disturb your sleep. Awake in your living room, up to 40 dB will not be noticed. A noisy office will have 60 dB and you will have to be very careful to avoid mistakes and getting fits. Mechanical saws, airplanes, etc., vary between 100 and 130 dB. They are dangerous.

Nature itself produces noise. Sometimes it exceeds the permissible level. Volcanic eruptions,

LONG LIVE  
ROCK!

All rock lovers  
should religiously  
avoid reading  
this paragraph  
consisting of  
unreadable  
parrot chattering

pop!

earthquakes and hurricanes show nature at its worst. But they are few and far between. But they are also reminders that the faculty of hearing is essential for our survival. Noise can deafen, it can madden. We have to control it as we control the defilation of our land, water and air.

Science of sound or acoustics began on that day in 1877 when

Thomas Alva Edison recorded human voice on a revolving cylinder covered with tinfoil. Despite all the harmful effects it acquired with time it has also given the human race immense benefits. We catch more fish, we survey ocean beds, we explore interior of the earth to get more oil, gas and minerals, we detect metal fatigue, and we diagnose diseases and cure them with sonar. But this gift should remain

a benevolent gift and not a malevolent destroyer.

Thousands of urban communities across the world are threatened by noise assaults. Noise pollution is something that can be controlled. We have the know-how. All that we need is the will to apply that know-how before it is too late. ---PIB. ○

(Contd. from page No. 132)

The soil pollutant of recent consideration are the radioactive materials accumulating in the soil from nuclear fall-outs or from the release of liquid or solid radioactive wastes produced by industrial or research establishments.

Insects and rodents comprise a major part of biological environment of man. Many times, they had been responsible for major outbreaks of epidemic and pandemics like Black death pandemic of plague in Europe in the 14th century which killed a quarter of the population of Europe and similarly in the recent past when 200,000 cases of denque occurred within a spell of 2-3 months in and around Kanpur<sup>11</sup>. Unfortunately, the multiplication of many of the important vectors and reservoirs of diseases is often the result of man's own actions. As human population increases beyond the capacity of municipal services to dispose of wastes, more and more bodies of water become suitable for the breeding of *Culex fatigans* with a consequent increase in filariasis transmission. Flies and rodents multiply on accumulating solid wastes, settling the stage for transmission of enteric diseases and often ratborne infections.

Besides transmitting diseases, rodents adversely affect availability of food-grains. On a world wide basis, 33 million tons of breadgrains and rice in storage are estimated to be lost to rodents each year, and the loss to insects is at least as great, if not greater<sup>12</sup>.

### Housing

The most intimate environment of man is the home and so this home environment affects his life in many ways. The problem of derangement of home environment is universal but the problem is more overt in

urban areas. Rapid and uncontrolled urbanisation generates a whole series of complex problems, of which, besides basic sanitation and environmental pollution, housing is important one.

More than one thousand million people throughout the world live in substandard housing conditions, and this situation is likely to worsen in the years to come. Poor housing is usually associated with lack of adequate water supply and basic sanitation facilities. It also facilitates entrance and harbouring of rodents and insects, with the resultant spread of diseases like malaria, filaria, trachoma and also an excessive number of rat and scorpion bite cases.

It has been stated that the design and construction of the house may help to produce mental unrest and thus exacerbate mental disorders already afflicting the occupants. The gloomy bleak and unattractive rooms and surroundings may accentuate mental depression.

The effects of rehousing was shown to be varying due to many other variables. But finally, certain studies have indicated that the morale and general adjustment of slum dwellers did not improve on rehousing and that neuroses and death rates increased after slum population were moved to better housing<sup>13</sup>.

### Ionising radiation

During the present century, mankind has been subjected to increasing levels of ionising radiation from man made sources such as x-ray equipment, nuclear weapons, controlled nuclear explosions, the nuclear fuel cycle and artificial radio-isotopes used for medical and other purposes.

Genetic effects of radiation hazards relate to the hereditary materials in the germ cells. The damage to germ cells may consist of (a) Lethal mutations or genetic death or (b) Non-lethal mutations which may

lead to an increased rate of genetic disorders in subsequent generations. As many of the non-lethal mutations are recessive in character, their somatic implications may become evident only after many generations. That is when the frequency of a specific mutation in the gene pool is sufficiently high so that there is a reasonable probability that two genes that have undergone the same mutation may meet in the impregnation process.

Not only the physical, chemical or biological components of environment are crucial to our health but also the social environment, *i.e.*, the people around us.

Infant mortality rates have been shown to be more sensitive to socio-economic and cultural characteristics of the population, than to variations in the provision of medical care.

### Poverty—the greatest pollutant

Considering the ever-increasing impact of socio-economic factors on health, Mrs. Indira Gandhi, the late Prime Minister of India, in 1972 Stockholm Conference on the Human Environment, very rightly introduced the concept that "Poverty is the greatest pollutant of all"<sup>14</sup>.

It is now widely recognised that most of our environmental problems start from a narrow single purpose approach in public or private actions, that affect human environment, whether in agricultural, industrial or urban development. There are perhaps too many examples of enterprises undertaken with more zeal than foresight, and of technical experts who are competent in their own environment but completely inadequate in a different milieu where they are unfamiliar with the total ecology of the area.

The exact impact on health, resulting from environmental change may be correctly assessed only by careful experimental epidemiological studies, but it has become increasingly clear in recent years, that environmental degradation, if allowed to proceed unchecked, could result in serious and sometimes irreversible damage to life on this planet.

To remedy such unfortunate situations, it is now current jargon to advocate an integrated approach where all aspects of a given problem are looked at from all angles, and where, ultimately, decisions affecting the environment and its resources are not taken independently of decisions affecting people.

Another matter of fundamental importance in preventing undesirable changes in environment and conditions detrimental to public health is regional planning with reference to various activities of the communities, such as work, education, rest and recreation, keeping in mind all the social and cultural factors that affect community health. The Environmental (Protection) Act, enacted by Indian Parliament in May 1986, is a positive step towards it.<sup>4</sup>

UNESCO's MAB (Man and the biosphere) programme attempts to bridge this gap between disciplines by mobilising applied research efforts all over the world on major man—environment—resource interactions.<sup>15</sup>

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## ADVERSE HEALTH EFFECTS OF ENVIRONMENTAL POLLUTANTS

DR DINESH CHANDRA

DR MANGESH SHUKLA

---

Better sanitation and therapeutic agents have shifted the concern about death and disability from infectious diseases to the risks which accompany exposure to certain chemical and physical agents. It may take several years before the toxic effects of some of these agents can be noticed. This article reviews some of the known pollutants and their adverse health effects.

---

**T**HE memory of Bhopal disaster is still fresh in our minds, on a cold December night in 1984, the world's worst industrial disaster struck the city. Forty thousand kilograms of lethal Methyl Isocyanate gas leaked out from a pesticide plant leaving 2500 dead and several thousand crippled.

In a less dramatic manner, but surely and steadily various pollutants, mostly originating from human activities, are threatening our wellbeing. Hundreds of chemical plants across India are polluting their environments and leaving their workers exposed to health hazards. Gas leaks-chlorine, ammonia, oleum

or others—are being reported frequently. Naturally, there is increasing public awareness and concern about environmental protection and industrial safety.

Better sanitation and therapeutic agents have shifted the concern about death and disability from infectious diseases to the risks which accompany exposure to certain chemical and physical agents. It may take several years before the toxic effects of some of these agents can be noticed. This article reviews some of the known pollutants and their adverse health effects.

Environmental pollutants can be classified according to the mode of exposure, *e.g.*, air, water and food. This approach is useful in a practical way to regulatory agencies. However, humans can be exposed to substances like pesticides, heavy metals and ionizing radiation through all the three modes of exposure.

#### Air pollution

The major part of air pollutants is produced by burning of fossil fuels. The burning of coal in thermal power plants and factories produces flyash and oxides of sulphur and nitrogen. Automobile exhausts pollute the air with carbon monoxide, oxides of nitrogen and a complex mixture of intermediate combustion products. Moreover, a number of agents like lead, arsenic, cadmium and asbestos have been observed in industrial and occupational settings. Exposure to some of these agents may occur in non-industrial settings also. For example, it may be seen with the use of asbestos as roofing material or of lead as a petrol additive. A large proportion of the world's population lives in urban areas where the impact of these pollutants is the greatest.

The respiratory tract is the major route of entry and is affected most frequently, resulting in diseases like chronic bronchitis, emphysema and bronchial asthma.

The important air pollutants are:

**Sulphur Dioxide (SO<sub>2</sub>):** Sulphur dioxide is a colourless, pungent gas released on burning coal and other fossil fuels. Next to flyash it is the commonest pollutant from thermal power plants. The Indraprastha power plant located in the heart of Delhi spews out 27 tonnes of SO<sub>2</sub> and 100 tonnes of flash every day.

It is no surprise that The World Health Organization (W.H.O.) has found Delhi to be the world's third unhealthiest city to live in.

Sulphur dioxide forms sulphurous acid on contact with moist membranes which acts as an irritant. Thus, exposure to SO<sub>2</sub> can cause cough, broncho-constriction, irritation of the eyes and lacrimation. It gives rise to 'acid rain' when mixed with water, which affects marine and plant life and interferes with food chains. The standard exposure limit is five parts per million (PPM) as a time weighed average for an eight hour workday.

**Carbon Monoxide (CO):** An odourless, colourless gas produced by incomplete combustion of carbonaceous material. The major source of general environmental pollution is vehicular exhaust. However, the commonest cause of personal exposure is cigarette and *bidi* smoking.

Carbon monoxide combines with haemoglobin to form carboxyhaemoglobin. Since the affinity of CO for the haemoglobin binding sites is nearly 200 times greater than that of oxygen, it reduces the ability of haemoglobin to bind with oxygen, resulting in tissue anoxia. The brain and heart are most affected by CO. The myocardium is very sensitive to CO when the coronary circulation is impaired. CO can worsen the prognosis in patients with acute myocardial infarction, may aggravate anaemia, peripheral vascular disease (dispose to infections), cough, headache, eye and nose chomotor performance. The current standards limit exposure to maximum of 50 PPM for an eight hour workday.

**Nitrogen Oxides :** Nitrogen oxides include nitric oxide (NO), nitrogen dioxide (NO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), etc., that are principally released from internal combustion engines and during the manufacture of fertilizers and textiles. At low concentrations, they cause damage to respiratory tract mucosa (which may predispose to infections), cough, headache, eye and nose irritation, etc. With higher exposure, acute pulmonary oedema, bronchiolitis obliterans and methaemoglobinaemia may occur.

**Chlorine:** It is a highly toxic gas used in the manufacture of paper, plastics textiles and chlorinated chemicals. A concentration of 30 PPM can induce

coughing and higher concentrations may lead to breathlessness, haemoptysis, tracheobronchitis and bronchopneumonia.

*Ammonia*: It is used in the manufacture of fertilizers and explosives. It can cause respiratory tract irritation, pulmonary oedema and chronic bronchitis.

*Hydrocarbons*: A major fraction of the urban air is composed of organic compounds. These include many known carcinogens like polynuclear aromatic hydrocarbons, e.g., benzpyrene and methylchloranthrene. Other examples are benzene, which is extremely toxic to the bone marrow and N-hexane, an aliphatic hydrocarbon which produces peripheral neuropathy.

*Methyl Isocyanate and Hydrogen Cyanide*: These compounds are used in manufacturing of pesticide. Cyanide salts are used in metal plating operations.

Symptoms of acute cyanide poisoning are headache, giddiness, breathlessness and unconsciousness. Chronic exposure leads to skin ulceration, nasal irritation, headache, tremors, etc. The antidote for cyanide poisoning is amyl nitrite inhalation and intravenous sodium nitrite or sodium thiosulphate.

*Smoke from Domestic Fuels*: In the developing countries, there is a high incidence of chronic bronchitis and pulmonary heart disease in women exposed to the fumes of firewood, cowdung or kerosene inside their homes. The smoke generated by these fuels contains almost all of the toxic components found in the smoke emitted when fossil fuels are burnt, but in concentrations far exceeding the permissible limits. Such exposure can be prevented by using smokeless 'chulhas'.

*Tobacco Smoke*: While the risks associated with tobacco smoking are well known, not many people are aware of the environmental consequences of exposure to tobacco smoke. Breathing in the vicinity of smokers in enclosed areas can cause lung cancer and other illnesses in healthy nonsmokers. Children of parents who smoke have more respiratory infections than children of nonsmokers. Infants in families having smokers have a greater risk of getting bronchitis and pneumonia. It is time we imposed more restrictions on smoking in the workplaces and in public buildings.

### Particulate air pollutants

So far we have seen the effects of gaseous substances that pollute the air. But there are also solid particles of different substances, dust, etc., suspended in the air, which can cause diseases.

*Dust*: Dust particles of different sizes produce different reactions in the body. Particles larger than 3 microns are coughed out. However, those between 0.5 to 3 microns reach the alveoli and give rise to dust diseases, also known as Pneumoconiosis. Some important dust diseases are discussed:

(i) *Silicosis*: It is caused by free silica in the form of quartz, theodolite or cristobalite. Occupational exposure occurs in mines and quarries, in the ceramics and glass industry, iron and steel industry, during sand blasting and constructions work. In the mica mines of Bihar 34% of the miners were found to have silicosis in a survey. In the stone quarries along the Delhi-Haryana border, silicosis is especially common.

Entry into the body is by inhalation. Particles between 0.5 to 3 microns reach the alveoli and give rise to nodule formation. The nodules may aggregate and massive pulmonary fibrosis may develop later leading to emphysema and impaired lung function. Symptoms include cough, dyspnoea on exertion and chest pain. An X-ray of the chest shows 'snow storm' appearance in the lung fields. The disease is gradually progressive and death occurs from right heart failure or from pulmonary tuberculosis which the silicotics are prone to develop.

(ii) *Anthracosis*: The disease results from prolonged inhalation of coal dust. It occurs in two phases, Simple pneumoconosis, a non-progressive condition, and Progressive Massive Fibrosis (PMF). PMF causes severe respiratory disability and shortens life expectancy. It is a notifiable disease under the Indian Mines Act.

(iii) *Byssinosis*: Byssinosis is due to inhalation of cotton fibre dust and afflicts 7 to 8% of the textile workers. It produces generalized air flow obstruction and chronic cough.

(iv) *Asbestosis*: The term asbestos is used for naturally occurring fibrous minerals containing silicates of varying composition. Asbestos enters the body by

inhalation and fine dust may get deposited in the lungs which causes pulmonary fibrosis leading to a 'small tight lung'. This may lead to respiratory insufficiency and even death.

Asbestos has been implicated in carcinoma of the bronchus, intestinal tract and mesothelioma, a rare cancer of the pleura and peritoneum. The risk of bronchial cancer is exceptionally high if exposure to asbestos is combined with cigarette smoking.

Clinical signs in patients of asbestosis include severe dyspnea, cyanosis, clubbing and cardiac distress. The lungs have a characteristic ground glass appearance on a chest X-ray. The disease is progressive once it is established, even after removal from further exposure. Asbestosis can be prevented by substitution with safer insulants, rigorous dust control and periodic examination of workers.

## METALLIC POLLUTANTS

Exposure to these can occur through air, water or food. The common metallic pollutants are:

**Lead:** It is the commonest metallic contaminant in the air. The largest source of environmental pollution is automobile exhaust which contains lead derived from tetraethyl-lead which is added to petrol to prevent knocking. Lead exposure may also occur through drinking water from lead pipes or chewing of lead paint on toys by children. Lead glazed earthenware and flaking lead paint are other possible sources.

Over 200 industries use lead, e.g., glass manufacture, storage batteries, printing, ceramics, rubber industry, etc.

Most of the lead in the body is found in the skeleton. Blood contains about 1%. Blood levels of 40 micrograms per 100 ml are considered excessive. Inorganic lead compounds cause anaemia, abdominal symptoms (colic, constipation) and blue line on the gums.

Organic lead compounds are primarily neurotoxic and their effects can range from fatigue, headache and irritability to behavioural disorders, mental retardation and even severe encephalopathy.

**Mercury:** Metallic mercury due to its volatility, has long been an industrial hazard. In 1953, in the village of Minamata, Japan, an outbreak of what became to be known as Minamata disease occurred for the first time. The origin of this disease was traced to contamination of the fish with methyl mercury in Minamata bay resulting from mercury discharged from a factory nearby. This occurred due to a pronounced tendency of mercury to bioaccumulate.

The symptoms of mercury poisoning include stomatitis, parasthesiae, tremors, (the hatters shakes) and emotional disturbances. Renal damage is well known and CNS damage can lead to cerebral palsy, ataxia and other symptoms mentioned above.

**Cadmium:** Poisoning affects the proximal tubules of the kidney and produces proteinuria. Cadmium concentration in air is positively correlated with hypertension and heart disease. It is carcinogenic to experimental animals.

**Arsenic:** It is a cumulative protoplasmic poison. Environmental pollution may arise from agriculture (weedkillers, fungicides, insecticides) and industry. Chronic poisoning leads to loss of appetite and weight, gastrointestinal disturbances, peripheral neuritis and skin lesions. It may produce bronchitis and lung cancer.

## Water Pollution

Polluted water contains any foreign substance—organic, inorganic or biological—that tends to degrade its quality so as to constitute a hazard or impair its usefulness.

Historically, consideration of the health effects of water pollution have been focussed on water borne diseases such as cholera, gastroenteritis, typhoid, etc. However, in recent years, chemical pollutants derived from industrial, agricultural and domestic wastes have assumed a greater importance.

The water pollutants of public health importance are organic compounds such as polynuclear aromatic hydrocarbons, Polychlorinated biphenyls, phenols

and pesticides, inorganic compounds like nitrites, nitrates, fluorides and metallic pollutants like lead, mercury, chromium, etc. Estimates of health effects are complicated by latency and the lack of definite data on dose response relationship.

**Organic Pollutions:** Over 400 organic chemicals have been identified in drinking water supplies. Chlorination, the most widely used water treatment method, is being questioned due to the possibility of harmful chlorinated compounds resulting from the reaction of chlorine with organic materials in water. Organic contamination of drinking water results from agricultural and urban runoff, discharges from industry and chlorination practices. DDT is a typical example of pesticides that persists in the environment. It tends to accumulate in the body fat. Peripheral neuropathy, CNS toxicity and liver damage may occur due to DDT. Many of the organic chemicals listed above have been identified in laboratory studies as having carcinogenic, mutagenic and teratogenic properties.

**Inorganic Contaminants:** Studies on lead and cadmium levels in drinking water have underscored the importance of corrosive water in introducing these metals at levels exceeding current drinking water standards.

Inorganic fluorides found in subsoil water can cause fluorosis. Nitrites combine with tertiary amines to form nitrosamines, a class of potent chemical carcinogens. Other inorganic pollutants such as asbestos, arsenic and selenium may also act as carcinogens.

### **Ionizing Radiation**

Ionizing radiation is present normally in man's environment. The annual dose of natural ionizing radiation is about 100 millirem of which 40% comes from radioactivity in the earth's crust, 40% from cosmic rays and 20% from radionuclides within the body itself.

The manmade sources of radiation contribute 75 millirem per capita every year. They are medical (diagnostic X-rays), occupational exposure and exposure from radioactive fall-out due to nuclear explosions.

A variety of cancers are associated with radiation exposure. They include leukemia, cancer of the breast, lung, thyroid, stomach, salivary glands, bone, skin, liver and various intracranial neoplasms.

Besides cancer, radiation causes damage to DNA leading to mutations, and to rapidly dividing cells in the gonads, skin, hemopoietic tissue, and gastrointestinal mucosa.

Workers exposed occupationally to ionizing radiation include those employed in medicine, in nuclear reactors and in various manufacturing and industrial activities. The maximum permissible dose is 5 rem per year. Protective measures like lead shields, lead-rubber aprons, other safeguards and periodic medical examination can help reduce the ill effects.

There has been a worldwide interest in preparing safety standards and codes of practice for the safe operation of nuclear power plants and enunciating the basic principles of radiation protection. This work has received a sense of urgency after the shocking accident at Chernobyl and the radiation leak at Three Mile Island.

### **Conclusion**

Environmental pollution causes disease and death and makes life less joyful. The sorry aspect of pollution is that it is created by human activity. There is, therefore, an urgent need to introduce standards and control measures on these activities. A recent W.H.O. report shows that the developing countries need to take stricter control measures because their populations are more vulnerable to the effects of pollution due to factors like malnutrition, unhygienic living conditions, infectious diseases and genetic predisposition.

Development without sufficient consideration for health and environmental safeguards can prevent the improvement of living conditions for the very people for whom the development was undertaken. It is the time for the Government and the society to take long term steps to protect our people from the threat of pollution. ○

# THE MAN-MADE ENVIRONMENT, HEALTH AND BEHAVIOUR

DR R. D. SHARMA

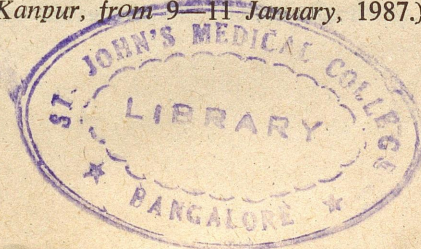
THE fast industrialization and general trend towards urban living has been one of the major facts of life in most Asian countries during the present century. This growth has been accompanied by undesirable changes in the pace and conditions of life of the inhabitants of cities. It is not infrequently asserted that these changes have produced an increase in the overall amount of stress which city-dwellers must endure—an increase which is in turn held to reflect itself in the growing numbers of the people who seek psychiatric treatment. Most of the studies conducted so far make only passing reference to those conditions which are associated with behavioural, psychological, and emotional stress. As research in behavioural toxicology and industrial Psychology expands into a more direct application to the people and their working conditions, the linkages between physiological and biochemical effects and the currently subjective measures of job dissatisfaction and stress should become clear. Smith *et. al.* have reported three incidents of industrial mass psychogenic illness, in which the majority of workers affected were women. The locations were an electronic assembly plant, an aluminium furniture assembly plant, and a dozen fish packing plants. Symptoms included weakness, sleepiness, nausea, bad taste and dry mouth and breathing difficulties—all symptoms which may be associated with exposure to toxic substances.

It is widely recognized that there is need for better means of measuring what is often called the 'quality' of the environment. The word 'quality' as it is used in this context, has an evaluative sense—it implies that there is a relative "value", "goodness", or "appropriateness" of the environment, which can

be measured in terms of its relation to something else. Under various circumstances this 'Something else' may be the health and survival of the natural systems that are part of the environment, the integrity of the natural physical features of the environment, the beauty of the landscape, or the appropriateness of the man-made parts of the environment to the activities for which they are used. However, most of the time this "Something else" is the "equality of human life" in the environment. The need that is most often remarked upon is a need for a way of evaluating how the "quality of human life" is affected by the environment, as by a part of the environment.

This paper is man-oriented. It is directed at the problems of measuring the effect of the environment upon the health and behaviour of the people. It is not primarily concerned with the effects of people upon the environment, nor is concerned with the effect of the environment upon human social groups as such. It is directed to the question of how to make measurements upon individuals which may reflect the effect of the environment upon their health and behaviour. It is concerned with the matter of how people are affected by their interaction with the environment in which they live.

(Abstract of the paper entitled "The Man-Made Environment, Health and Behaviour" presented by the author at the '1st Asian Conference on Behavioural Toxicology and Clinical Psychology' held at N.S.I., Kanpur, from 9—11 January, 1987.)



# WOMEN, WATER AND SANITATION

DR (MS) T.V. LUONG

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Various strategies for enlisting women's participation in promoting water and sanitation activities have been tried out successfully on a small scale. However the mechanisms to enlist their active participation for wide-scale application are yet to be developed and tried out. The present attention should, therefore, be directed at evolving strategies for scaling up women's participation.

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**W**ATER is vital to life. Yet, over one billion people in the developing countries do not have easy access to safe drinking water. It is estimated that this section of population will reach two billion by the end of this decade. In India about 300 million rural population are to be provided with safe water by 1990.

Fetching water for their families from whichever available source at whatever distance is a way of life for hundreds of millions of women, particularly in rural areas. In India, many women in some places spend daily as many as six hours and use up more than half a day's energy for fetching water. A substantial amount of the water these women bring home, is neither safe nor adequate. According to WHO, approximately 80% of all sickness and diseases can be attributed to inadequate water and poor sanitation. For example, diarrhoea directly kills six million children in developing countries each year and attributed to the death of up to 18 million people yearly. In India alone, 1.5 million of children below the age of five die of diarrhoea every year.

Clean water is easily contaminated in insanitary environment. This problem is further compounded by the inadequate care taken in storing the water at home due to a combination of ignorance and careless attitudes.

It is now realized that providing safe drinking water alone will not achieve the health benefit unless it is integrated with the improvement of sanitation. Hence, United Nations launched the International Drinking Water Supply and Sanitation Decade (IWSSD) with the objectives of promoting safe and adequate drinking water and better sanitation.

Low cost and appropriate technologies are currently largely available in the context of water supply and sanitary facilities. This naturally reduces significantly the financial burden of a government and/or the community. However, the success of the water and sanitation programme also depends to a large extent on the human elements as it inevitably involves the planners, the implementors and most importantly, the users. The facilities provided, regardless of their excellence of construction and function, cannot achieve their objectives if they are not being used, or when used, they are not being properly maintained.

## Women, health and the decade programme

Women, as wives and mothers particularly in rural areas, bear the responsibility of collecting the domestic water supply and firewood and cooking the food. Furthermore they feed and care for the children, the elderly and the sick. In addition, the majority of them spend many hours in the field for cultivation. These long hours of hard work leave them little time to care for themselves, their children and homes. Yet,



Woman of Memari Block, chlorinates the family drinking water at home.

the level of hygiene in millions of these families is largely dependent on these women who are quite often over worked and malnourished. As a result they can be the agents of disease transmission. Equally they can be the change agent for improved sanitary practices. Their potential role in improving sanitation to reduce mortality and morbidity rate of infants and children is undeniable.

Naturally, the prime users and beneficiaries of these improved facilities are women. They should, therefore, be considered not as passive recipients but as active participants in the use and management of domestic water, personal hygiene, food and home

sanitation both at household and community level. They will appreciate the benefits of improved water and sanitation. However, they should be involved right from the planning stage in identifying problems and suggesting likely solutions. Their effective involvement in the activities would enhance proper usage and maintenance facilities. For example, women can suggest a convenient location for a public tap or a handpump in their village. Recognising the importance of the link between women, water and sanitation, a World Conference of the United Nations Decade for women recommended full participation of women in planning, implementation and application of technology in the decade programme.

#### **Education, community participation and involvement of women**

While it is important to promote women in the process of planning, implementing, educating the community in the water and sanitation programme, the involvement of rural women in these developmental activities is by no means easy. Considering the women's status in the community, low literacy rate, poverty and social and cultural milieu in which women live, if they are to actively participate in these schemes, they need the support of their men, their community, their leaders and their governments.

Awareness of the needs and benefits of these schemes should be created among both men and women in the community including all levels of community leaders and government functionaries. In addition, appropriate training and orientation should be given to women to motivate them for effective participation. Training and education will help to build up the confidence of the rural women and to equip them with the knowledge to gain the support of their menfolk and the community.

Having to shoulder domestic responsibility, it is quite often assumed that women would be acceptors, users, and agents of behavioural changes. While it is true that the influence of wives and mothers are more effective on the hygiene and behaviour of their family members, the full support from the other half of the population—men—are vital to enable women to carry out their tasks effectively.

Our experiences indicated, for example :

- Women often need the permission from their husbands or fathers to carry out promotion, education and motivational activities in the community.
- Contribution in cash or in kind comes from their men for such matters as the construction of family latrine and for buying soap for family handwashing.

### Women's contribution

In the past decade, UNICEF has been supporting the Government of India (GOI) to provide improved water supply to rural areas. More recently, in its collaborative effort with the GOI to fulfil its decade objectives, UNICEF has contributed in uplifting sanitation as a priority issue both at the government and the community level. In promoting sanitation as a package of health-related activities requiring behavioural and attitudinal changes, rather as a purely latrine scheme, the role of women is, therefore, evident. Some strategies adopted giving emphasis on enlisting women participation are outlined below:

#### 1. *Illiterate rural women reduce significantly children diarrhoeal incidence*

Women in many villages of Memari block, West Bengal, collect their drinking water from unprotected water sources namely ponds and shallow wells with handpumps. The women were trained in the technique of adding chlorine to their drinking water pitchers in addition to adopting various sanitary habits. By consuming disinfected water, a reduction of 80% of children diarrhoeal incidence was achieved within 12 months of intervention.

Deworming of children in these communities won the confidence of mothers and the community. This activity proved to be an effective educational tool to promote better personal hygiene (i.e. washing hands with soap before eating and after defecation) and the use of the sanitary latrine.

Selected village women were trained as motivators. These women are illiterate. More than half of them are grandmothers. These women motivators were

able to spread simple health and sanitation messages correctly in spite of their illiteracy.

Furthermore, it is evident that village elderly women can motivate their junior village womenfolk more effectively. As a grandmother and mother-in-law she has authority in the family. Once she is motivated herself to adopt sanitary practice, she can supervise their daughters and daughter-in-law to do so.

#### 2. *Women handpump caretakers*

Selected village women and men were trained side by side as village handpump caretakers. In Andhra Pradesh, more than one thousand women handpump caretakers are operating in a large number of villages.

Handpump caretakers are volunteers. To qualify as a handpump caretaker, the villager should live near the handpump site and be willing to devote some time to work for the community. They are selected by the block functionaries and the village leaders. Preference is given to capable women.

Handpump caretakers are given two-day's training on simple handpump maintenance as well as some sanitation and hygiene knowledge so that they can educate and motivate the handpump users. They attend to simple routine maintenance. However, when the handpump breaks down due to major faults he or she reports the problem to the block mechanic for repair by sending a prepaid postcard.

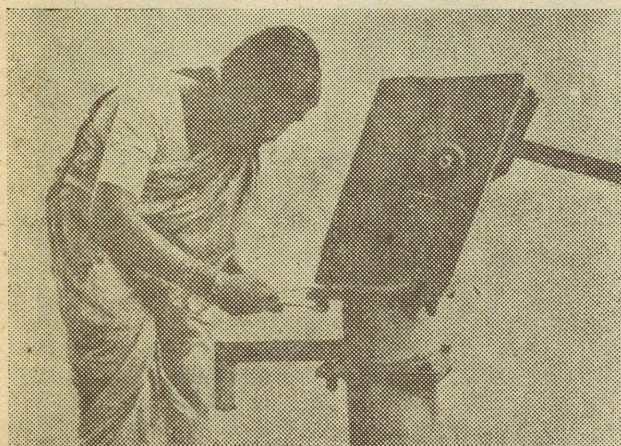
#### 3. *Anganwadi and sanitation*

Under the Integrated Child Development Service (ICDS), the network of *anganwadi* centres covers huge area in the country. It is a vast readymade infrastructure which could exert a profound influence on many pre-school children, mothers and community. The *anganwadi* centres are run by female workers from the villages. The integration of sanitation programme in ICDS not only has the direct benefit to women and children but also takes advantage of the availability of a huge number of trained grass-root women, as sanitation educators, trainers and motivators.

As a part of their pre-service training, the *anganwadi* workers are exposed to the importance of water and sanitation as a measure for child health. With the aims of more intensive promotion of sanitation at the *anganwadi* centre, UNICEF is implementing sanitation schemes on a small scale. The scheme emphasizes on educating and promoting habit changes and good personal hygiene. The construction of sanitary facilities in selected *anganwadi* centres aims at reinforcement of behaviour changes. The *anganwadi* workers, their supervisors, and the child development officers (CDPO) are given two-day orientation on sanitation.

#### 4. Women income generation scheme and sanitation

The Development of Women and Children in Rural Areas (DWCRA) programme implemented by Rural



A woman handpump caretaker at work.

Development Department (RDD) covers activities such as income generation schemes and non-formal literacy classes, etc., for rural women. In villages under such scheme, RDD provided training centres where women come daily to learn certain skills for a period of six months. Female group leaders from RDD are responsible to organise these activities in these centres.

DWCRA scheme offers yet another readymade infrastructure for promotion of sanitation by women.

UNICEF supported rural sanitation schemes are to be taken up in selected DWCRA areas using the women's groups as the entry point to the community. The female group leaders will be given two-day sanitation orientation. They would educate and motivate those women participating in the income activities and also help to organise sanitation promotion activities in the villages.

#### Conclusion

Safe water supply and sanitation relating to change of sanitation habit and personal hygiene should be promoted as a way of life.

Various strategies for enlisting women's participation in promoting water and sanitation activities have been tried out successfully on a small scale. However, the mechanism to enlist their active participation for wide-scale application are yet to be developed and tried out. The present attention should, therefore, be directed at evolving strategies for scaling up women's participation.  $\Delta$

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## WORLD ENVIRONMENT DAY--5 JUNE

June 5 every year is observed as the World Environment Day. The Day seeks to highlight the strategy for environmental protection and rational use of natural resources, assessment of environmental impacts, low and non-waste technology, reutilization and recycling of wastes, management of hazardous wastes, the protection of flora, fauna and their habitats and questions to combat environmental pollution.

This issue of *Swasth Hind* is devoted to Environment, Sanitation and water.

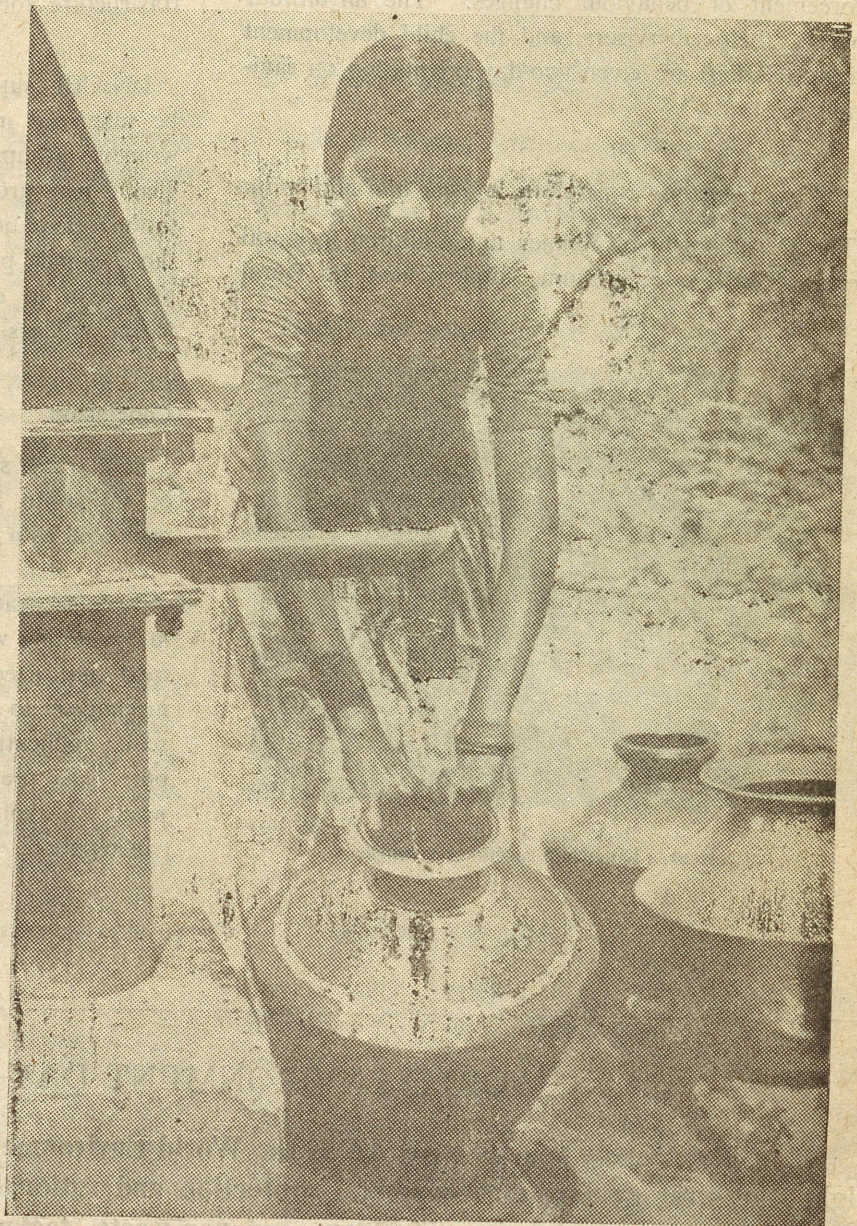
# WATER SUPPLY FOR VILLAGES

M. L. KAPUR

POTABLE water is one of the fundamental needs of life on earth. While polluted water is a carrier of diseases and has been always causing havoc in the form of endemic diseases like cholera and diarrhoea, lack of safe and clean drinking water affects the quality of life particularly in rural areas. That is why in all the health programmes of the country, stress has always been laid on the supply of safe water to the people. Planning process has also given it the due importance and more and more funds have been allocated for water supply in the successive plans.

While situation in larger cities and towns has improved considerably in the last forty years of planned development large parts of rural India still feel neglected and do not have adequate drinking water facilities. Despite the constraints of resources the Government is committed to provide drinking water to all the villages by the turn of the century if not by the end of the current Five Year Plan. The Twenty-Point Programme 1986 aims at providing safe water for all villages, assisting local communities to maintain sources of such water supply in good condition and ensuring special attention to water supply for Scheduled Castes and Scheduled Tribes.

To attain this priority objective of the Government of providing



safe drinking water to the entire rural population the subject was kept as a part of the Minimum Needs Programme in the Sixth

Five Year Plan and nearly Rs. 4,000 crores was spent on it both in the Central and State sectors. To accelerate the rate of growth there has

been a quantum jump in investment in this sector and an allocation of 6522.47 crore rupees has been made for the next five years.

### Work in the States

Funds have been provided in the State budgets right from the start of planning era in 1951. Though schemes for rural water supply were implemented initially under Community Development Programme, in 1954 the State Governments started entrusting the work to separate departments to tackle the problem of water supply and sanitation.

It was found in the mid-sixties that rural water supply schemes were being implemented in the villages which were easily accessible and could be tackled without much technological skills neglecting the rural areas which had problems in getting the much needed water for domestic purposes.

Taking into account the magnitude of the problem and in order to cover speedily the problem villages the Central Government introduced the Accelerated Rural Water Supply Programme in 1972-73 and assisted the States with 100 per cent financial assistance to implement the schemes in villages. With the introduction of the Minimum Needs Programme the ARWSP was withdrawn in 1974. However, it was re-introduced in 1977-78, when it was observed that the progress in the provision of drinking water to the identified problem villages was not at the expected rate.

### Problem villages

A 'Problem Village' is one where there is no safe source of drinking water within a distance of 1.6 km or where water is available at a depth of more than 15 meters and in the hilly areas where the elevation difference is more than 100 meters or where water sources has excessive salinity, iron, fluoride and other toxic elements hazardous to health or where water is exposed to the risk of water-borne diseases like cholera or guineaworm.

The Seventh Five Year Plan will attempt covering all those villages which do not have an assured source of water supply within a distance of 0.5 km. The present norm of availability of forty litres per capita per day will be enhanced to seventy litres per day.

Various States and Union Territories had identified about 2.34 lakh problem villages by 1978. The number later increased to 3.265 lakhs in 1980. At the same time it was observed that 94 thousand of these villages had already been provided with safe water supply leaving 2.31 lakh villages to be tackled as on 1 April, 1980.

As a result of the intensive efforts and investment 1.92 lakh problem villages and 0.437 non-problem villages were covered during the Sixth Plan and 0.39 lakh villages spilled over to the Seventh Plan. Further survey to identify villages that have become problem villages under the revised norms is being undertaken by the States.

### Seventh Plan Strategy

The salient features of the Seventh Plan strategy for rural water supply include a high priority to coverage of the spillover problem villages followed by coverage of problem villages identified subsequently and then partially covered problem villages. Coverage of SC/ST habitations funds will be earmarked for SC/ST under Accelerated Rural Water Supply Programme in the same proportion as earmarked for SC/ST under the State Sector Minimum Needs Programme for SC under the Special Component Plan and for ST under Tribal sub-plan.

State Governments and local bodies have by and large not been able to make adequate provisions and arrangements for maintenance, e.g., keeping the surroundings of water sources clean, construction of drains, soaking pits and preventing water-logging. Special attention will therefore be given towards

operation and maintenance of created sources. States have been allowed to spend 10 per cent of the plan funds under MNP for maintenance.

Under the Peoples Action for development, voluntary agencies would be involved in the execution and maintenance of water supply schemes. Emphasis will also be given to community participation and health consciousness through extension work and mass media.

Special efforts will be made to develop low cost option for providing safe drinking water to the rural areas as an alternative to capital intensive schemes. With this objective a Technology Mission on drinking water in villages and water management has been launched. It aims at finding lowcost but effective alternative solutions to capital intensive schemes and development of traditional sources. It will also involve a multi-disciplinary approach, conjunctive use of water sources, periodic testing of water besides development of appropriate technology.

### Quality of work

Experience has shown that faulty or incomplete execution of schemes defeats the very objective of providing potable water. Attention has to be given to maintenance of the water supply points to maintain continuous supply of drinking water. Involvement of womenfolk in selecting the water supply points and their maintenance can help because they are the prime users of water. Users of water could be imparted training to undertake simple repairs and to safeguard the environment. Similarly, there has to be a proper and effective coordination between the village and district authorities for regular check-ups.

As resources are limited it is necessary that we look around for new ideas but also think in terms of using once again the traditional methods after improving them to suit local needs. —PIB.

# TRIBAL WOMEN AND THEIR HEALTH PROBLEMS

DR. (Smt) PRABHA RAMALINGASWAMI

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*To understand the impact of government health programmes, a study was conducted on women from economically weaker section especially the tribal women. The sample consisted of 372 tribal women in 15-45 age group living in Paderu Block of Visakhapatnam district in Andhra Pradesh. Although these women were illiterate and were living in a remote place away from urban influence, they showed awareness about these health programmes. About 50% of the women have liked to have their babies delivered by Auxiliary Nurse Midwives and trained dais. However, it was approximately 17% of women who could avail the services of the dais and Auxiliary Nurse Midwives. Unfortunately the health programmes have not benefitted them. The author discusses reasons for this in this article.*

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WOMEN in India have always enjoyed a unique position. On one hand they have been deified, have been praised as being the corner-stone of Indian society and have been depicted as the very personification of moral force that binds the family together. On the other hand women in real life have been denigrated and have been subjected to many hardships. (Report of the Committee on the Status of Women in India, 1974).

The polarisation that exists between the privileged sections of society and the masses, influences the problem of women. It is the women from economically weaker sections especially the tribal and rural women that are adversely affected. Women who are the prime producers of the necessities of life; women on whom the society depends so heavily for economic support and family health care are the prime targets of these inequalities and injustices. These women are poor and illiterate. They are working not by choice but by force of circumstances. They are working as agricultural labour, as construction workers, and in agri-based industries like tobacco and cotton. All the back-breaking jobs in agriculture, all the jobs which are health-hazardous—in tobacco and other industries

are done by women. The wages that are paid to them are very low in comparison to the work of their male counterparts and in comparison with the quantity and quality of work they do. A lot has been written on this. To quote a few: (Anita Dighe 1985), (Kalpana Bardhan 1985), (Vimal Balasubrahmanyam 1985), (Leela Gulati 1981), (Murali Manohar *et al* 1981), (Saradmoni 1982), (UNICEF Report on Women in Development 1980), (Vina Mazumdar 1982).

Added to these are other problems which these women face. They have to fetch drinking water (sometimes from very long distances) and fire-wood and cow dung for cooking. The result is that in addition to work outside the house and inside the house, they are spending more time and energy for getting cooking fuel and drinking water. The work at home is itself not regarded as important or remunerative. The work she does outside is hard and wages are usually very low. She is usually in a poor state of health. Repeated pregnancies, chronic under-nutrition, hard work, lack of health care and basic amenities have sapped all her energies. Yet she is the key person in the family—it is she who takes care of the children and every member of the family. Among

this economically weaker section it is the tribal women who are most disadvantaged. Often one hears about tribal medicines and the preference of the tribals to follow their own system of medicines. What is the reality? Are the tribal women aware of government health services? What is their knowledge about some of the communicable diseases that affect their health? A study was conducted in order to understand the above issues.

### Objectives of the Study

(1) Are the tribal women aware of the Primary Health Centre?

(2) Are these women aware of maternal and child health services rendered by auxiliary nurse midwives? If so, have they utilized their services.

(3) Are these women aware of family planning services and utilised them?

(4) Are these women aware about TB, leprosy and malaria?

### Area of the study

Six villages near Paderu Block in Visakhapatnam District of Andhra Pradesh are included in this study. Paderu has 93% tribal population and is completely rural. It has a female literacy rate of 3.05%. It is the headquarters of the tribal division and is about 150 km. from the district headquarters. The nearest town (which has a population of 21,000) is about 74 km. Out of the six villages, one village is about 10 km distance from Paderu, another village 8 km. another village 6 km. and two villages are 4 km. and two villages are 3 km. from Paderu.

### Sample

A total of 372 women in 15-45 age group were included in the study. For each household one woman was interviewed. Fifteen women were literate without educational level, 20 women had about two to three years of schooling. All of them were married and had at least one child. They are all tribal women. This group was selected for the study because of their illiteracy and poverty and were living far away from urban areas.

### Techniques used

The women were interviewed with the help of an interview schedule consisting of open ended questions. The interviews were conducted in their houses and at

times that was fixed by pre-arrangement. After establishing rapport and after collecting identifying data and background information, questions were asked about childbirth, the persons who helped them during childbirth and the persons they would like to have during childbirth, whether they were aware of the tetanus toxoid injection (part of the immunization programme of the government and which an ANM is supposed to give) which reduces maternal mortality, their knowledge about family planning programme, and their knowledge about diseases like T.B., leprosy, malaria and goitre (which is prevalent in this region) and awareness about primary health care (PHC). The attempt here has been for understanding the existing factual knowledge they have about these problems.

### Analysis of data

Content analysis was done on the responses. Here the most important features of the results are presented in the following Tables.

Table I---CHILD BIRTH

Deliveries by	Persons who actually had their deliveries		Persons who preferred to have this category	
	Number	Percentage	Number	Percentage
Family Members	304	81.72	188	50.54
A.N.M.	4	1.08	107	28.76
Local Dais	58	15.59	77	20.69
Hospital	5	1.34	—	—

The above Table clearly indicates that although the services of ANM have not reached these people they are aware about them and nearly 29% have said that they would have preferred to have an ANM attend on them. Although the present group of women are tribal women living in a remote area away from urban influence their responses are similar to those of rural women studied by Banerji (1982).

Table II—TETANUS TOXOID INJECTION

	Number	Percentage
Those who received	58	15.59
Those who did not	314	84.41

Table III—AWARENESS ABOUT DISEASES

	Number	Percentage
T.B.	111	29.84
Leprosy	105	28.23
Malaria	368	98.92
Goitre*	121	32.53

\*While they were aware about Goitre as swelling near the neck, it is only 121 who knew it was a disease and could be prevented by changing the salt, *i.e.*, iodised salt.

Table IV—FAMILY PLANNING PROGRAMME

	Number	Percentage
Persons who were aware of government Family Planning programme	345	92.73
Persons who used this programme	249	66.94
Persons who said there should be only two or three children	289	77.69
Persons who said that there should be 3 years of difference between children	286	76.88

Table V—AWARENESS ABOUT PHC AND OTHER GOVT. PROGRAMME

Programme	AWARE		USED	
	Number	Percentage	Number	Percentage
P.H.C.	249	66.94	249	66.94
Developmental	186	50.00	186	50.00
Adult Education	25	6.72	5	1.34

#### Discussion

The Tables presented here bring out one point very clearly that these people are aware of the government programmes. The programmes have not yet reached them. For instance, it is only 4 out of 371 women who had the luxury of having their babies through the

hands of an ANM. Yet 107 out of 371 (nearly 29%) were aware about ANM as a trained person and preferred to have her attend on them.

Likewise almost everyone was aware of malaria worker and associated him with fever tablets and blood smear. It is indeed interesting to notice that malaria programme reached these villages and every one knew about malaria.

Although this area is an endemic area for leprosy, TB also is quite common. It is approximately 29% of the women who could mention the important symptoms of these diseases and were aware of the possibilities of treatment. Considering the illiteracy of these women it is interesting to note that so many were aware of these diseases and the possibilities of treatment.

Family planning/welfare programme reached these women. They were approached by family planning workers and were motivated for going in operation and dutifully mentioned to us that the number of children one should have is two or three and that there should be a gap of 3 years between children, thus reflecting the publicity of the family welfare programme. These women have heard about PHC and have made use of the PHC at times when a family member was acutely ill or at the time of an accident. However they look upon PHC as hospital and though they are not aware of the preventive work supposed to be carried out by PHC they identify ANM and the malaria workers with PHC.

The most basic health service which a women needs is during maternity. A proper care during this crucial period will substantially help the women to maintain a reasonable health. The emphasis on family welfare has taken away most of the time of ANMs. In addition in a forest area where most of the villages do not have access to bus, where walking a two mile distance means walking through an uphill forest path will pose even more problems for ANMs to reach the women in their areas and render MCH care. It is in such places the most deprived among the disadvantaged live. One of the solutions could be increase in the number of ANMs and trained dais in such region. MCH care is most important for women. ANMs who are supposed to give this care are not able to effectively render this. Instead of finding fault with them the approach should be to see their difficul-

ties, solve their problems and ensure that they are able to discharge their duties without much physical strain to themselves. For instance, in this region most of the villages are beyond 3 miles from a bus stop and this would definitely be a lot of strain even to reach one village lot alone cover a number of villages. It is here that consideration for the problems of ANM will help. It is only an increase in the number of *dais* and ANM that will make MCH care a reality. While this is often talked about, it is one of those areas that is not implemented. A four-fold increase in the number of ANMs and demarcation of an area which they can cover without much physical strain and a reasonable amount of time for MCH work within the constraints of working for family welfare programme will improve the MCH services for these women. This in turn will improve their health.

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## WHO REGIONAL OFFICE BUILDING A "NO SMOKING" AREA

As of 7 April, celebrated as World Health Day, smoking is no longer permitted anywhere in the building of the WHO Regional Office for South-East Asia. The only exception will be a room on the fourth floor which has been specially modified for the purpose. A similar curb on smoking in WHO Headquarters in Geneva also came into effect from 7 April 1987 while Regional Office buildings in Brazzaville, Washington, Alexandria and Manila have been "no-smoking" areas for some time.

In announcing the measure, the Organization cited mounting evidence that "passive smoking"—involuntary exposure to tobacco smoke—is harmful to the health of non-smokers. According to a 1985 report of WHO's International Agency for Research on Cancer (IARC), "passive smoking gives rise to some risk of cancer".

The Organization's statement on the new measure notes that "the workplace is recognized by health authorities as being usually the place where the most substantial exposure to passive smoking occurs. It has been calculated that a non-smoking office worker sharing the office with a smoker could inhale the equivalent of a few cigarettes per day in smoke particles".

In many countries, an increasing number of health and non-health institutions, commercial and business undertakings are adopting non-smoking policies on their premises based on considerations of personnel health and comfort.

The curb on cigarette smoking in the Regional Office building, it is hoped, will help protect the health of staff members (a majority of whom are non-smokers) as well as visitors, to the building. Further, it will serve as an example of ensuring a smoke-free working environment to national institutions such as schools, factories, government and business premises and hospitals as well as other international organizations. This is all the more important in view of a 1986 WHO report which described cigarette smoking as "the major avoidable cause of ill health and pre-mature mortality in the countries where it is widespread". The report estimated that the world pandemic caused by tobacco use results in at least one million premature deaths each year.

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## International Year of Shelter for the Homeless—1987

# PLANNING FOR A SOUND HOUSING

DINESH CHAND

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**A serious threat to physical and mental health of the population and their social well-being has been felt by most countries because of the over-crowded housing and the resultant unhealthy environment. The author feels over half of the diseases of the metropolitan areas could be eliminated through proper understanding of the factors effecting health of community and sound environmental planning of housing. In this article he highlights housing envionics, planning in accordance with the minimum standards and role of various groups of interest, education media and public health engineers.**

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HOUSING IS A BASIC and indispensable need of the human beings. The country at present is facing a colossal housing shortage. The estimated housing shortage of about 21.3 million dwelling units have been assessed by the National Buildings Organisation on the basis of 1981 census data in urban and rural sectors. For gradual eradication of a country's housing problem, the United Nations recommended the construction of atleast 10 new houses per 1000 population annually. Against this, our annual rate works out to be less than one unit per 1000 population. Now almost all possible efforts and financial assistance are being provided by our Government for promotion of housing programmes. Our planners ignore to incorporate the environmental factors in their housing programmes. Fortunately, it is now being increasingly realised that adequate housing as well as healthy and hygienic environment are not only the pre-requisites for a balanced and harmonious growth of economy but they also increase the productivity of people, raise their morale and standard of living.

The first report of the WHO Expert Committee on the Public Health Aspects of Housing has defined housing as, "The physical structure that man uses for shelter and the environs of that structure including all necessary services, facilities, equipment and devices needed or desired for the physical and mental health and social well-being of the family and individual." This report further points out that the im-

mediate surroundings of residential buildings should be included in housing environment. Thus the residential environment, as it may more explicitly be termed, should be considered not as an isolated subject of study but as one of the several environmental health problems associated with planning and development, and having economic and social aspects.

### What over-crowded housing does

The present study will indicate the high incidence of major crimes, delinquency and fires and the high costs of services of slum areas. Data have been gathered elsewhere which indicate that over half the diseases of the metropolitan areas are found within the so-called 'Slum districts' of the cities. The incidence of tuberculosis bears a close relationship to the degree of crowding in dwellings. The other diseases like penumonia, influenza, rickets, plague, typhus, tularaemia, trichinosis, rat-bite fever, infectious jaundice and home accidents are far more prevalent in these areas of poverty and congestion, unhealthy housing.

In view of above Indian environmental engineers and planners can play not only a major role but can also take a lead in the field of housing activities through their considerable knowledge and understanding of environmental problems affecting community

health. In collaboration with public work departments, the planning departments and city and regional authorities, they may practically influence the decisions and approval of plans relating to water supply, sewerage and drainage systems, overcoming runoff and flooding hazards of surface water, etc. These services are so important for protection of public health that upto date and complete information about them is essential for the operation and activities of public health engineering departments.

### **We need planning and regulations**

About 45 years ago, C.E.A. Winslow, with his commentary on Hygiene of Housing of the American Public Health Association (APHA), established the basic principles of healthy housing. These have covered four major areas of concern: (1) the fundamental physiological needs, (2) the Psychological needs, (3) protection against contagion, and (4) protection against accidents. In its first report, the WHO Expert Committee has outlined the similar principles covering four levels of planning: (1) the prevention of premature death, (2) the prevention of disease, illness and injury, (3) the attainment of efficiency of living, and (4) the provision of comfort.

The planning of healthful housing should include following major aspects:

- (1) Provision of space for light, air and recreation;
- (2) Provision of adequate water supply and proper sewerage, drainage solid waste disposal facilities;
- (3) Freedom from accident hazard;
- (4) Clean air;
- (5) Freedom from unnecessary noise and disturbances;
- (6) Insect, rodent and nuisance control; and
- (7) A land use plan.

Presently, in some areas of development there has been a tendency to place many dwellings on small plots of ground, without any provision for children's play, space nor sufficient room for adequate natural lighting, proper air circulation between dwellings and, more important, protection from fire hazards.

Every community needs space for small parks, play grounds, etc., for children to play, for adult recreation, for mental stimulation and relaxation and for other community activities which aid the total health of individual and the family.

### **Potable water, must**

It has long been recognized that an adequate, safe potable public water supply is essential for public health and thus needs careful planning and designing. Generally, the lack of adequate quantity of water at various peak demand periods is one of the difficulties in a number of the big metropolitan areas. The lack

of adequate water pressure in the municipal distribution system can cause inconvenience as well as serious health hazards due to contamination in the system by back-siphonage.

Every effort should be made in all metropolitan cities to develop a water carried sewerage system, with a provision for suitable treatment. Moreover the dangers of contamination of surface and ground water sources is frequent in the case of septic tank system. The domestic solid wastes disposal is also an important factor in metropolitan cities due to a rodent problem, fly and mosquito breeding, and other nuisance. Too often surface drainage problems are overlooked expecting the original drainage channel to perform this function.

### **Remove hazards**

The planners should endeavour to see that for dwellings, especially those on highways and streets, such patterns are designed as minimise accidental injury or death. The programmes of overcoming existing hazards in substandard dwellings should be prepared by them because structural deficiencies are found in many of our older as well as newer dwellings. Consideration should also be given to the removal of accident hazards for children in residential streets.

### **and nuisance**

New habitat should be located possibly in the far off places to protect people from industrial odours, gases, dust, and fumes. Existing air pollution problems should be tackled with the help of state pollution control boards or by shifting either industries or habitants, whatever is easy and economical in such cases.

Industrial noises particularly those from railroads, motor traffic and other sources which disturb comfort are all potential health hazards. For new housing programmes these aspects should be considered and corrective measures taken such as altering timing of various industrial operations in areas where disturbance is of serious character. Necessary steps for control of insects and rodent should also be taken to minimize the nuisance.

For a best housing environment, the environmental engineers/planners should cooperate in developing master plan or land-use plan for the entire area, stipulating future land-use for various public purposes. After housing plans have been completed by a development authority, it is essential that regulations and zoning methods are adopted which assure implementation of the recommendations for land use, thoroughfare, and community-facilities. Its enforcement can assure proper protection of housing areas from the factors detrimental to the community which may vitiate the utility of an area for housing purposes. In notifying industrial areas, the planners should observe the additional regulations and consult other concerned government authorities.

Minimum standard should be adopted based upon principles of hazard-free housing as indicated in the WHO Expert Committees Report on Public Health Aspects of Housing. In the Soviet Union the mass housing programmes are carried out in accordance with All-Union Building Standards and Regulations which are revised periodically. All-Union Building and Hygienic Standards of the Soviet Union provide that the total noise levels of dwelling houses and public buildings should not exceed 35 decibels in the day time (8 A.M. to 10 P.M.) and 30 decibels at (10 P.M. to 8 A.M.). In all such cases the special abilities, experience and training of the environmental engineer can play an important role in the development of new codes, ordinances and enforcement procedures. It would be of great advantage if a clearing house could be established whereby a more effective enforcement could be assured.

Further, code enforcement can prevent the deterioration of housing facilities because of unapproved and substandard remodelling of dwelling units. Care must be taken, however, that all the principles of proper housing are fulfilled in such remodelling operations.

### Appraisal

The appraisal of existing housing facilities and the need for improvement, can well be accomplished through the concentrated efforts of various governmental agencies under the leadership of well qualified and experienced environmental engineers. Census data are an important tool and key to understand the metropolitan housing problems. For an all out attack on the blight and the spread of deterioration of existing housing, a thorough analysis of entire community and its neighbourhood must be made. The US Housing and Home Finance Agency has recommended following four steps for developing a programme for an attack on the blight:

1. Delineate the residential areas of the community by neighbourhoods for study and planning purposes.
2. Determine the location, extent and intensity of blight in each neighbourhood.
3. Analyse each neighbourhood in terms of its condition and need for treatment.
4. Make recommendations for action-programme required to meet neighbourhood needs, such as code enforcement, public improvements, conservation, reconditioning, clearance and re-development.

It is essential that neighbourhoods be analysed as a whole and the condition of housing in terms of the general environment be considered. Also the pattern of land-use, traffic-flow, street arrangement and neighbourhood facilities and services may also be considered. Further, the APHA housing appraisal methods and techniques and the modified appraisal methods of the city of Detroit may also be consulted for valuable guidance. Such a study and analysis of

data will sometimes indicate the need for complete removal of substandard housing in situations where corrective measures are found ineffective. This practice may provide an opportunity to appraise the value of housing facilities of a community and to determine on a long-term basis the total liability in terms of substandard or dilapidated housing conditions.

### Corrective steps

Appraisal of existing housing conditions is followed by suitable long-term planning for solution. In most communities, following four basic types of housing area are found:

- (1) Areas which are essentially satisfactory and will require protective action only.
- (2) Areas which show incipient blight or which are subject to adverse effects from conditions beyond their borders. These areas will require protective and corrective action.
- (3) Substandard areas which are basically sound enough to be brought upto an acceptable standard by a comprehensive approach to their problems.
- (4) Areas which are unsuitable for continued use and cannot be elevated to an acceptable standard economically because of poor quality of dwellings and environmental conditions. These areas will require redevelopment.

Programmes of improvement involve following three types of approach:

- (1) *Conservation*: It requires retaining and protecting all satisfactory elements of the dwellings and their environments.
- (2) *Rehabilitation*: It requires repairing, remodelling, renovating or supplementing basically sound dwellings and their environment.
- (3) *Redevelopment*: It requires demolition of individual or groups of structures and planned reuse of individual premises.

### Education and publicity

The key persons in each neighbourhood of community should be approached and their enthusiasm and interest aroused for correction of existing hazards. Civic organisations, groups of parents and citizens, clubs, etc., should be educated and exposed to the problems existing in the community. Simultaneously, the planners should be in close contact with the government bodies which are responsible for provision of public facilities. Another group of interest is of those who have a strong economic interest in such development, for example, businessmen, builders, real estate interests, mortgage houses, banks, etc. In the Detroit Metropolitan Area, the Governor's office formed a so-called 'task force' composed of representatives of all interested groups. This task force, with officials from the various organisations have worked together and found most successful in its

## More assistance for rural housing

**RURAL HOUSING** is an integral part of the Minimum Needs Programme of the Government. During the Sixth Plan a scheme for Rural House Sites-cum-Construction Assistance was in operation as a part of the Minimum Needs Programme. The total number of landless families which were provided house sites under the Sixth Plan is estimated at 13.07 million. However, the analysis has revealed that there are still 0.72 million landless families to be provided with house sites. As regards construction assistance, 19 lakh families were assisted against the target of 36 lakh.

During the Seventh Plan the remaining 0.72 million landless families will be covered on a priority basis. For this a sum of Rs. 36 crore has been earmarked. Along with allotment of house sites, the scheme also provides assistance for construction. During the Plan, efforts

would be made to provide construction assistance to those families already provided house sites. A target of 2.71 million families has been fixed for provision of construction assistance at a total cost of Rs. 541 crore. The amount of assistance per family has also been revised upwards: it is proposed to provide assistance to the extent of Rs. 500 per family for provision of developed house site of 100 sq. yards each, against the current provision of Rs. 250. Similarly, for construction assistance, it is proposed to increase the amount to Rs. 2000 per family against the provision of Rs. 500 at present.

Besides the provision of Rs. 577 crore made in the Plan for Rural Housing under Minimum Needs Programme, an amount of Rs. 240 crore would also be made available during the Seventh Plan from institutions like HUDCO and General Insurance Corporation.

mission under the leadership of Chief Engineer of Environmental Health Division of the Health Department.

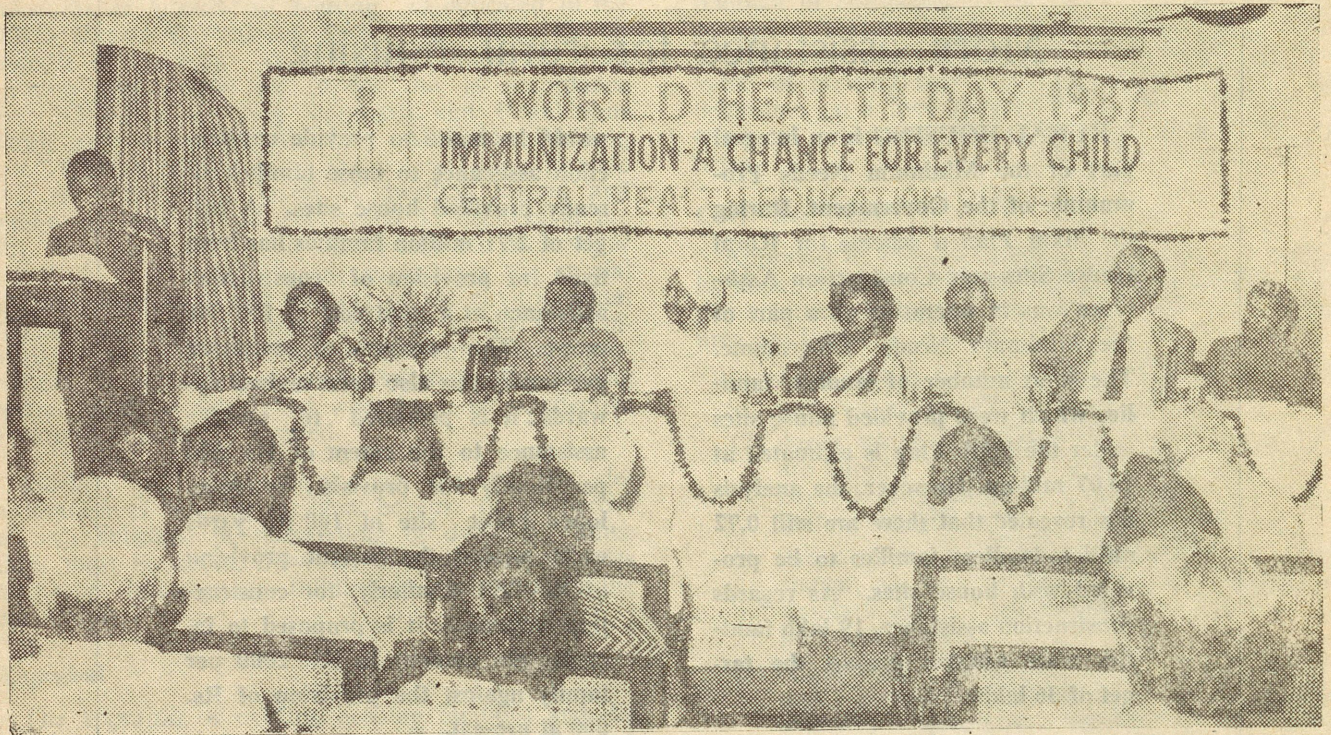
The application of health education techniques of housing can play an important role in the same manner as in the field of communicable disease control. For thorough understanding of problems of the people within an area, the sociologist and the educator may play an important role.

### Mass education

The Mass education activity should include the production of numerous simply-worded, well-illustrated pamphlets, brochures and bulletins related to problems of rubbish disposal, rodent control, building maintenance, gardening, improvement of yards, open spaces, etc., which can encourage an individual for improving his home and its surroundings. The publicity must be coupled with demonstration of ideal dwelling units and providing information relating to

the efforts which can easily be made by themselves and financial aspects of improvements. Enthusiasm for community improvement may be developed through area-wide publicity, institution of awards, public recognition of individual efforts and inclusion of environmental studies in the schools syllabi.

There is an ever-increasing concern on the part of public health authorities about the need for rapid and effective action to stem the spread of blight which is constantly extending into neighbourhood particularly in metropolitan areas. The numerous examples can be noticed indicating the direct interaction between sub-standard housing and communicable disease, mental health, chronic disease, etc. Great rewards can be realised from improved housing programmes stated herein, through improved health, economic status and dignity of large number of the people of the country.—*Courtesy: Yojana, Vol. 13, No. 18* ○



World Health Day—1987

## VACCINES PRODUCTION BEING GEARED

M. L. MEHTA

**T**HE Central Health Education Bureau organised a function on the eve of the World Health Day on 6 April, 1987 at its office building in New Delhi. The venue, in fact bore a festive look. The theme was—"Immunization : A chance for every child". A large number of functionaries of the Central

Health Education Bureau, Directorate General of Health Services, Ministry of Health and Family Welfare attended the function. Representatives from international agencies like WHO, UNICEF, Voluntary agencies and a cross section of the public participated in this function.

Inaugurating the function, Shri S. S. Dhanoa, Secretary, Ministry of Health and Family Welfare, expressed the confidence that India could meet the challenge of covering 100 per cent children under the immunization programme by 1990. The programme of Universal Immunization was launched on 19 November 1985, the birthday of late Prime Minister Smt. Indira Gandhi.

The programme aimed at immunizing children at birth against communicable diseases and reducing the infant mortality rate. While India had the highest childbirths it also shared the dubious distinction of reporting the largest child deaths every year.

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Photo above: A view of the World Health Day function held at the Central Health Education Bureau, New Delhi. Photo shows Dr V. P. Kimati, Programme Officer (Health), UNICEF, Regional Office for South Central Asia, addressing the gathering. Sitting on the dais from left to right are: Dr (Smt.) V. K. Bhasin, Director, CHEB; Dr A. K. Mukherjee, Addl. Director General of Health Services; Shri S. S. Dhanoa, Secretary, Ministry of Health and Family Welfare; Smt. Rami Chhabra, Adviser (Media), Ministry of Health and Family Welfare; Dr Mahendra Dutta, Deputy Director General (Planning); Dr B. Popovic, WHO Representative to India, and Dr V. M. Bagley, Deputy Assistant Director General, CHEB.

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The challenge taken may be "premature", but "we have taken it at the highest level", that is the level of the Prime Minister of India, Shri Rajiv Gandhi, the Secretary said.

In fact, every month the Prime Minister reviews the progress of the programme. And "we have not been able to satisfy him", because a programme of the magnitude of immunizing all the children of India, that too, by 1990 "needs mobilization of the community and creating awareness about it," Shri Dhanoa said.

Under the Technology Mission for Immunization, Shri Dhanoa said, production of vaccines was being geared and the country would be in a position to manufacture all the vaccines required by 1989.

#### **High drop-out**

The high drop-out rate was one of the major challenges being encountered in the immunization of the programme. The child was supposed to be vaccinated three times and by the third time the drop-out was as high as 30 per cent. There was a clear-cut link between high mortality rate and drop-out rate.

It is here that the "CHEB has taken up the task of health education and mobilization of the community. The need is to share the problems with the people and not putting them under the carpet", he said.

Another problem was preservation of the potency of polio vaccine which required to be kept at a low temperature. Efforts were being made to devise methods to maintain the potency even without adequate power supply. The World Health

Organization and UNICEF could assist to find out if a special type of refrigerator called island refrigerator could be made for installation in villages. Shri Dhanoa said that the Government was committed to establishing a primary health centre for every 30,000 population and a sub-centre for every 5,000 people by the end of 1990.

#### **Intensive programme**

Dr B. Popovic, WHO representative to India, said: "Immunization is one of the most powerful and cost effective weapons of modern medicine. Diseases like measles, diphtheria, pertussis or whooping cough, tetanus, polio and tuberculosis, which mostly strike children can be checked by getting vaccinated against them.

Dr Popovic said since the Expanded Programme of Immunization (EPI) was launched by the WHO in 1974, intensive national programmes were established in the countries of the South East Asia Region. Efforts were under way to improve the existing vaccine he said.

#### **Child survival**

"There is too much propensity in the world today to kill, than to preserve life. This is reflected in the obsession shown by many developing countries to spend more and more on arms than on social, economic and human development. Incidentally only 500 crores of rupees (i.e., 0.0005% of total global annual military expenditure), is needed to fully immunize all the infants born in the third world annually", said Dr Valerian P. Kimati, Programme Officer, Health Services, UNICEF.

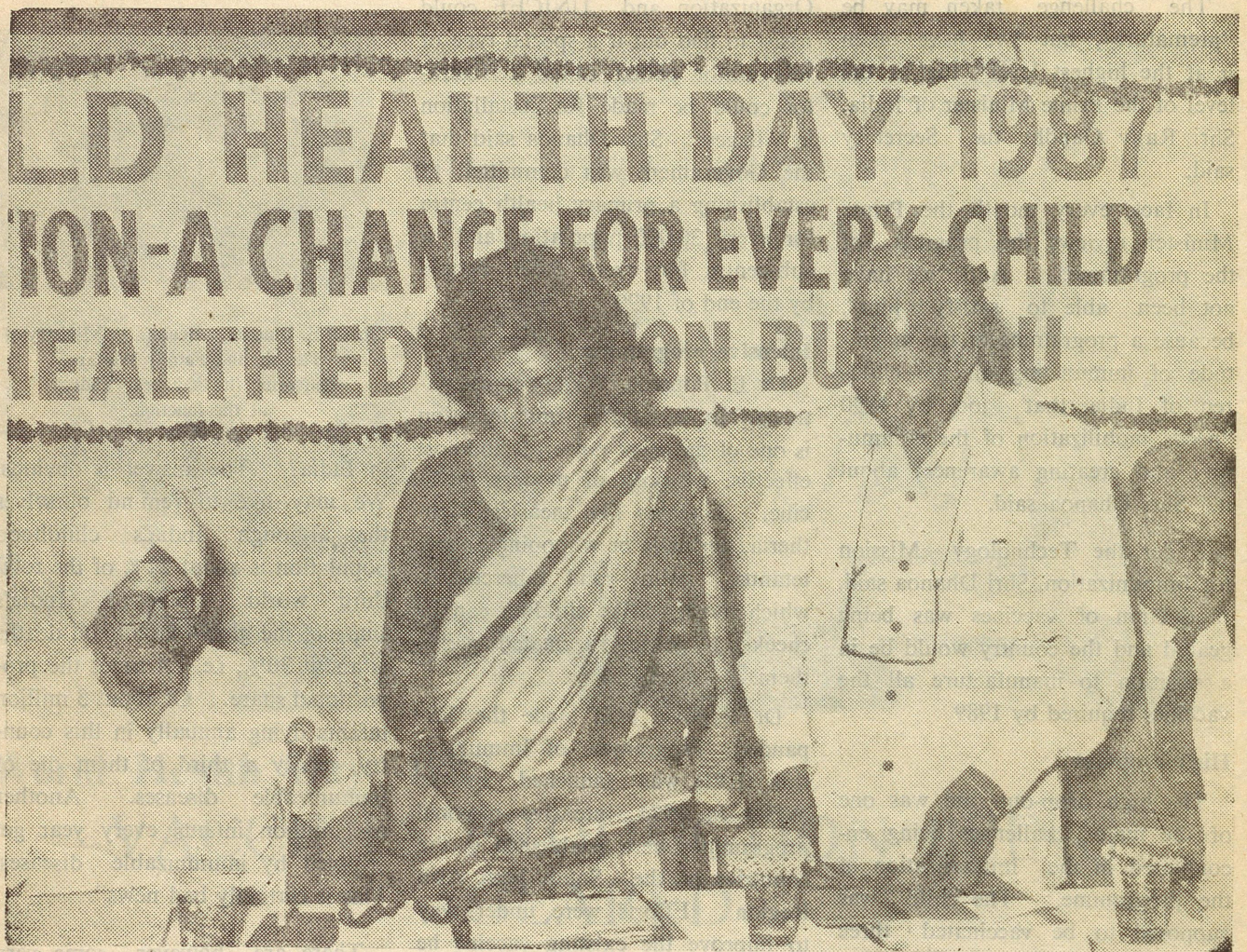
"Why is it that immunization is being given such a high publicity



Shri S.S. Dhanoa, Secretary, Ministry of Health and Family Welfare, delivering the inaugural address at the function.

in India? The answer is obvious. We may like to remind ourselves that although India's childhood population is about 22% of the total third world population, India's share of the global childhood deaths is about 30%, i.e., 1.4 times the proportional share. Of about 3 million infants dying annually in this country, nearly a third of them die of immunizable diseases. Another one million infants every year get crippled by immunizable diseases. This is certainly bad news".

There are however some very good news for India, he said. "India leads the world not only in numbers but also it leads the third world in several development and economic fronts. India is self-sufficient in food production and production of essential industrial goods. Currently India stands to be the seventh most industrialized country of the world. The country has enormous trained manpower, the fourth largest in the world and potential material resources. India's economy has always had an upward trend as opposed to many of the third world countries which have been caught in the trap of almost unrepayable debts. A mere 100 crores of rupees which is the current cost



Smt. Rami Chhabra, Adviser (Media), Ministry of Health and Family Welfare, releasing the special numbers of monthly journals, Swasth Hind (English) and Arogya Sandesh (Hindi) on the World Health Day theme: "Immunization: a chance for Every Child", at the function

of 3 modern fighter planes, can immunize every child born in this country each year. In short, India has the capability to save its children and let them develop to their full potential", Dr Kimati said.

Family planning has been one of the highest priority programmes in India. Currently a two-children family norm is being advocated. Here too there is some good tidings, helpful to the immunization programme.

The recently revised Family Welfare strategy, which aims to reduce

the birth and death rates dramatically, to slow down the population growth rate and to stabilize India's population at a level of 1300 million by the year 2050, accords high priority to the EPI as well as to the National Diarrhoea Management Programme. This reflects a new recognition of the synergistic relationship between fertility control, child mortality reduction and improved quality of life.

India has given priority to child survival in its national development and is committed to achieve univer-

sal immunization through the Universal Immunization Project (UIP) which was specially set up 2 years ago as a strategy to achieve this goal.

"This year, India intends to immunize 16.9 million infants and 18.6 million mothers, the largest number in any country of the world", said Dr Kimati.

#### **Mobilising all media channels**

Smt. Rami Chhabra, Adviser (Media), Ministry of Health and Family Welfare, released the special

number of *Swasth Hind* (English) and *Arogya Sandesh* (Hindi) brought out on the theme of the World Health Day by the Central Health Education Bureau.

Commenting on the special issue of these two magazines she said, they have been "brought out well".

There was a need to make the EPI a "people's movement"; And "how can we do it?" she asked.

Television stations throughout the country have been persuaded to screen one minute messages on various aspects of family planning including immunization at prime time and closed-circuit television and public address systems at railway stations are also being brought into use. We need to mobilize all the media channels at our command, said Smt. Chhabra. We already have a fairly vast media network supporting health and welfare directly, but we are now getting support from practically all media channels in the country.

But this movement has to be taken further. Apart from television and radio there was a vast army of field publicity, including song and dance troops, as well as the widespread extension channels of the health and family welfare system. But more importantly we are now bringing in the development functionaries dealing with agriculture, women and child development and other fields. We are getting across the understanding that the family welfare message including immunization is central to other development concerns, said Smt. Chhabra.

#### **Involvement of voluntary agencies**

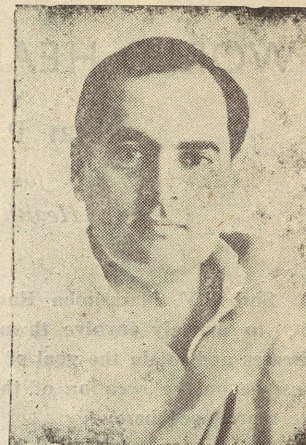
Dr A. K. Mukherjee, Additional Director General of health Services,

#### *Message*

## WORLD HEALTH DAY—7 April, 1987

SHRI RAJIV GANDHI

*Prime Minister of India*



In a message on the World Health Day, the Prime Minister, Shri Rajiv Gandhi, has made an appeal to all to support the Immunization Programme so that our children have a better and brighter future. The World Health Day was observed on 7 April, 1987. The message says:

"Health for all" is one of the basic tenets of our approach towards human resources.

"As a vital component of this approach, the Universal Immunization Programme was launched in November 1985 in the memory of the late Prime Minister Smt. Indira Gandhi who firmly believed in securing a better future for our children.

"By covering expectant mothers and infants against six dreaded diseases, the Programme aims to protect millions of our people from death and disability and the wasteful effects of illness and poor growth.

"Such a stupendous task cannot be undertaken without the involvement of the community and the required awareness and motivation on the part of parents. It is significant, therefore, that this year the underlying theme of the World Health Day is "Immunization". On this occasion I appeal to all to support this challenging venture so that our children can have a better and brighter future."

in his presidential address said "India is self-sufficient in the production of vaccines" under EPI except polio and measles.

Polio vaccine is being imported at present, but is likely to be produced in the country shortly. Efforts are being made for indigenous production of measles vaccine through imported technology, said Dr Mukherjee.

There was need to "lay tremendous emphasis on community involve-

ment" and education of mothers for immunization, said Dr Mukherjee.

Another significant feature of EPI was involvement of voluntary agencies. They could contribute a great deal in mobilizing people for immunization of children, he said.

#### **Health education programme**

Earlier, Dr V. K. Bhasin, Director, Central Health Education Bureau, in her address of welcome said that the Bureau was observing in its modest way the World Health

## Message

# WORLD HEALTH DAY—7 April, 1987

SHRI P. V. NARASIMHA RAO

*Union minister for human resource development and  
Health and Family Welfare*

Shri P.V. Narasimha Rao has appealed to all members of the community to actively involve themselves in the fight against vaccine-preventable diseases and attain the goal of Universal Immunization by 1990. Excerpts of his message on the occasion of the World Health Day, observed on 7 April, 1987, are reproduced here:

"Out of the approximately 3.8 million deaths taking place in the world due to these vaccine-preventable diseases, it is estimated that India's share in the deaths and disabilities caused by polio, tetanus, pertussis and measles is about 44 per cent, 31 per cent, 41 per cent and 39 per cent respectively. This contributes in considerable measure to the still high infant mortality rate prevailing in India.

"To combat these diseases and help reduce the infant mortality rate, Programme for Universal Immunization of pregnant women and infants has been launched since 1985. It is India's living memorial to the late Prime Minister, Smt. Indira Gandhi. Under this programme it is proposed to protect, by 1990, all pregnant women against tetanus and all infants with vaccination against the six vaccine-preventable diseases. Through immunization as well as other interventions like better nutrition, improved hygiene, etc., it is estimated that the infant mortality rate would be brought below 60 by the turn of the century.

"However, this goal cannot be achieved unless a total and dedicated move is made by the people involved in the programme, as well as the community at large. I would, therefore, seek all members of the community to actively involve themselves in this noble endeavour and, thereby, ensure the survival and improved health of millions of mothers and children."

Day each year since 1957. "The accent throughout has been on health education of the people with a view to winning their active support and participation in different health programmes."

Suggested guidelines and a Back-grounder to the observance of the programme against six child diseases brought out by the bureau were sent out to the health organisations including State Health Education Bureaux, medical colleges, and

media organisations like AIR & TV.

"Radio and T. V. too, would brodecast/telecast programmes on the theme of the Day.

An exhibition was organised for different localities for education of the viewers.

Filmshows on immunization were planned for different localities to educate people on the importance

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of immunization of infants, children and expectant mothers.

"In short, a concerted, continued health education programme has been planned to help achieve the target of providing immunization of infants and children and expectant mothers by 1990," said Dr Bhasin.

Dr V. M. Bagley, DADG, proposed a vote of thanks.

The function concluded with a puppet show on immunization.



## EXHIBITION ON WORLD HEALTH DAY 1987

### Shri Dhanoa Inaugurates

Some 800,000 lives are saved every year by immunization in the developing world. And how can a mother protect herself, her baby before and after birth from the six vaccine-preventable diseases were some of the highlights of the exhibition set up for the World Health Day 1987. The exhibition was organised by the Central Health Education Bureau at its building on Kotla Road, New Delhi on the theme of the Day—Immunization: A Chance for Every Child.

Shri S. S. Dhanoa, Secretary, Union Ministry of Health and Family Welfare, while inaugurating the exhibition, on the eve of the World Health Day on 6 April, 1987, said that the exhibition was informative and entertaining and should prove an attention getter of the mother for getting her child immunized against childhood diseases.

Through a series of panels, and telling pictures, the exhibition highlighted the nutritional requirements of

a mother before, during and after child-birth. It also highlighted the significance of breastfeeding for the healthy growth of her baby.

The exhibition brought out vividly that immunization is truly a chance for every child. And how a mother can protect herself and her child against six vaccine-preventable diseases—measles, diphtheria, pertussis, tetanus, polio and tuberculosis. Through photographs it spelled out when and how the vaccinations should be given to the child and mother and where such facilities were available.

Indeed, the exhibition, a feast for eyes, was received favourably by one and all the viewers.

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*Photo above:* Shri S. S. Dhanoa, Secretary, Ministry of Health & Family Welfare, going round the Exhibition. Seen with him are Dr (Smt) V.K. Bhasin, Director, CHEB, and Dr B. Popovic, WHO Representative to India.

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