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PROTECTING HEALTH FROM CLIMATE CHANGE

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Abstract: *A growing Body of Scientific evidence strongly suggests that climate change has enormous and Diverse effects on Human Health. Rises in temperature and Sea level and extreme weather events such as floods cause water logging and contamination, which in turn exacerbate Diaorrhoeal Diseases. The spatial and Temporal Distribution of vector–borne diseases like Malaria and Dengue has been projected to increase due to favourable temperatures, with resulting alternations of communicable Disease dynamics.*

Climate Change is a global issue and its adverse impact can effect the entire world. However, the poor and most vulnerable populations are likely to be disproportionately affected, with poorer nations bearing the burnt of the impact due to deficient health systems and resources of various forms of pollutions like Air, Light, Noise, Soil, Water, Radioactive, Thermal, Visual are High lighted. The effects of pollution on Human health, Environment, Regulation of pollution control methods all are explained along with Ayurvedic remides which are easily available for a lay man can be explained, like purification of vitiated Air, Water, Land, all are explained and useful to control the pollution for environment and for man kind etc.

The Magnitude of the problem makes it imperative to Raise greater awareness of the threats of climate change, especially among policy–Makers, but to do so, Sustainable strategic planning and funding are urgently needed. An effective, sustainable response requires an assessment of Health Risks, integrated action, financial Investment and Multi sector collaboration is necessary

Keywords: *Climate, Pollution, Regulations, Health, Environment, Ayurveda remidies.*

Introduction: The term Environment implies all the external factors living and Non-living Material and Non- Material which surround and around the man. In its modern concept environment includes not only the water, Air, Soil that form our environment but also the social and economic conditions under which we live [1]. For descriptive purpose environment has been divided into three components all closely related (1) Physical (2) Biological (3) Social. Here the two words are explained in detailed aspect.

Pollution: Pollution is the introduction of contaminants into a natural environment. That causes instability, Disorder, Harm or Discomfort to the eco-systems. That is physical systems or living organisms. Pollution can take the form of chemical substances or energy, such as Noise, Heat or Light which is going to be influence on Human life.

Pollutants: The components of pollution can be either foreign substances, energies or naturally occurring contaminants. In simple word pollutants are a waste material that pollutes, water, air, soil, environment and human life. A pollutant is a waste material that pollutes Air, Water or Soil. 3 Factors Determine the severity of a pollutant its- 1. Chemical Nature, 2. The Concentration, 3. The Persistence. The key to man's health lies largely in his environment, in fact much of Man's ill health can be traced to adverse environmental factors such as water pollution, soil pollution, Air pollution, poor Housing constructive conditions etc.

Often man is responsible for the pollution of his environment through urbanization, industrialization and other human activities. In 1972 the UN conference on the human environment focused world wide attention on the environmental hazards that threatens human beings.

Forms of Pollution

1. Air Pollution
2. Soil Contamination
3. Water Pollution
4. Noise Pollution
5. Light Pollution
6. Visual Pollution
7. Thermal Pollution
8. Radio Active Contamination**.**

1. Air Pollution: The release of chemicals and particulate into the atmosphere. Common gaseous pollutants include carbon monoxide, sulfur dioxide, Chloro fluoro carbons (CFCs) and Nitrogen oxides produced by industry and motor vehicles. Photo chemical ozone and smog are created as Nitrogen oxides and hydro carbons react to sun light. Particulate matter or fine dust is characterized by their micrometre size PM 10 to PM25.

2. Soil Contamination: Occurs when chemicals are released by spill or under ground leakage. Among the most significant soil contaminants are Hydrocarbons, Heavy metals, Herbicides, pesticides and chlorinated Hydrocarbons.

3. Water Pollution: By the Discharge of waste water from commercial and industrial waste (intentionally or through spills) into surface water, discharges of untreated Domestic sewage and chemical contaminants such as chlorine, from treated sewage, release of waste and contaminants into surface runoff flowing to surface waters (including urban run off and agricultural run off, which may contain chemical fertilizers and pesticides),waste disposal and leaching into ground water, eutrophecation and littering.

4. Noise Pollution: Noise Pollution which encompasses Road way noise, air craft noise, industrial Noise as well as High intensity sonar.

5. Light Pollution: Includes light Trespass, over–illumination and astronomical interference.

(i). Littering: The criminal throwing of inappropriate man–Made objects un-removed, on to public and private properties.

6. Visual Pollution: Visual Pollution which can refer to the presence of over lead power lines, motor way bill-boards, scarred land forms (as from strip mining) open storage of Trash or municipal solid waste.

7. Thermal Pollution: Thermal Pollution is a temperature change in Natural water bodies caused by Human influence such as use of water as coolant in a power plant.

8. Radioactive Contamination: Resulting form 20th century activities in Atomic Physics, such as Nuclear power generation and Nuclear weapons research manufacture and Deployment (alpha emitters and actinides in the environment).

The Clear Indication of Purpose

1. The Air Composition: Air is a Mechanical mixture of Gases [2]. The Normal composition of external air by volume is approximately as follows:-

Nitrogen: 78.1 %

Oxygen: 20.93 %

Carbon Dioxide : 0.03 %

The balance is mode up of other gases which occur in trace Ex: Xenon and Helium. In Addition to these gases air also contains water vapour. Trace of Ammonia, suspended matter such as Dust, Bacteria, Spores and Vegetable Debris.

Sources of Air Pollution

- Automobiles
- Industries
- Domestic Sources
- Tobacco Smoke
- Miscellaneous

Air pollution comes from both natural and Man made sources [3]. Though globally man made pollutants from combustion, construction, Mining, Agriculture and warfare are increasingly significant in the air pollution equation.

Motor vehicle emissions are one of the leading courses of air pollution, China, US, Russia, Mexico and Japan are the world leaders in air pollution emissions.

Principal stationary pollution sources include chemical plants, coal-fired power plants, Oil refineries petro chemical plants, Nuclear waste disposal activity, Incinerators, large live stock farms (Dairy cows, Pigs, poultry etc) PVC factories, Metals production factories, Plastic factories and other heavy industry.

Agricultural air pollution comes from contemporary practices which include clear felling and burning of Natural Vegetation as well as spraying of pesticides and Herbicides.

Air Pollutants

- Carbon Monoxide
- Cadmium
- Sulphar Dioxide
- Hydrogen Sulphide
- Lead
- Ozone
- Carbon Dioxide
- Polynuclear Aromatic Hydrocarbons
- Hydrocarbons
- Particulate Matter

1. Ozone pollution can cause Respiratory Disease, cardio vascular disease, Throat inflammation, Chest pain and congestion [4].
2. Oil spills can cause skin irritations and rashes.
3. Noise pollution includes Hearing Loss, High Blood Pressure, stress and sleep Disturbance.
4. Mercury air pollution causes Developmental Deficits in children and neurologic symptoms.
5. Lead and other Heavy metals have been shown to cause Neurological problems.
6. Chemical and Radio active substances can cause cancer and as well as Birth Defects.
7. Carbon dioxide emissions cause ocean Acidification, the on going decrease in the PH of the Earths oceans as co_2 becomes dissolved.
8. The emission of Green house gases leads to global warming.
9. Nitrogen Oxides are removed from the air by Rain and fertilize land which can change the species composition of ECO system.
10. Smog and Haze can reduce the amount of sunlight received by plants to carry out photo synthesis and leads to the production of tropospheric ozone which Damages plants.
11. Soil become infertile and unsuitable for plants.
12. Sulfur Dioxide and Nitrogen oxides can cause Acid rain which lowers the PH Value of soil.[5]

2. The Criteria

Safe and Whole Some Water: Water intended for human consumption should be both safe and whole some. This has been defined as water that is [6]

1. Free from pathogenic agents.
2. Free from Harmful Chemical Substance
3. Pleasant to the taste that in free from colour and odour.
4. Used for Domestic purpose.
5. Water is said to be polluted or contaminated when it does not fulfill the above Criteria.

3. The Vitiated Land: Bhoomi place of Stay. The Specific features of Epidemics are mentioned in Cha. Vimana Sthanam–3rd chapter [7] under the Heading Jana pada Dwamsaniya. Jalam, Vayu, Desam (Land), Kalam under this Headings. Adharma (Un Righteousness) is the Root causes for the derangement of all the factors causing epidemics.

The Kalam (The Time): Epidemics are going to be effected at the same Time, place causes mass Destructions (or) same symptoms with same food are causative factors, So much population is effected, at the same time.

The Methodology: Pollution can be controlled by the following Methods.

1. Recycling
2. Reusing
3. Reducing
4. Mitigating
5. Preventing

4. Methodology of Pollution Control

a. Source correction methods.
b. Pollution control equipment
c. Diffusion of pollutant in Air
d. Vegetation
e. Zoning

a. **Source Correction Methods Done by**

i. Substitution of Raw materials.
ii. Process modification
iii. Modification of Existing Equipment
iv. Maintenance of Equipment

b. **Pollution Control Equipment–Done by**

i. Control devices for particulate contaminants.
ii. Gravitational setting chamber
iii. Cyclone Separators (Reverse flow cyclone)
iv. Fabric Filters (Bag house Filters)
v. Electro static Precipitators.
vi. Wet Collectors (Scrubbers) Done by- (a) Spray Tower, (b) Venturi Scrubber, (c) Cyclone Scrubber
    1. Diffusion of Pollutant in Air
    2. Vegetation
    3. Zoning

The Pollution Control Devices

1. Dust Collection Systems

a) Baghouses
b) Cyclones
c) Electro Static Precipitators.

2. Scrubbers

a) Baffle Spray Scrubber
b) Cyclonic Spray Scrubber
c) Ejector Venturi Scrubber
d) Mechanically aided Scrubber
e) Spray tower–Dunddubhi swaneeyem (Suskalpa–6th Chapter)[8]
f) Wet Scrubber

3. Sewage Treatment

a) Sedimentation (Primary Treatment)
b) Accumulated Sludge Bio treat (Secondary Treatment) also used for Industrial waste water.
c) Aerated Lagoons.
d) Constructed wet lands (also used for urban Runoff)

4. Industrial Waste Water Treatment

a) API oil-water Separators

b) Bio Filters
c) Dissolved air Flotation (DAF)
d) Powdered activated carbon treatment
e) Ultra Filtration

5. Vapor Recovery Systems

The Major Results with Ayurveda

1. The Purification of Air

a) Dhoopana Karma with Drugs like Laksha, Hareedra, Ativisha, Abhaya, Harenu, Ela, Vakra, Kustha, Priyangu useful for purification of air. (SUS. KAL 3/17)[9]
b) Shigruadhi Agada
c) Fine Powder of Devadaru, Natha, Anantha, Arjuna, Gairikam, Vajrakanda, Latha, Lodhra are to be sprinkled over the Top of the Trees, Flag pastes, Tall Pillers, Gabels of Tall Houses etc. By coming into contact with this powder everywhere the poison air becomes Detoxified (AS. SUT: 8/48)**[10]**

2. Water Purification Treatment: Susruth Mentioned 7 Purification Drugs in (Sus.Sut 45/27)[11]. (a) Kataka (b) Gomedaka (c) Bisagrandhi (d) Shivala Moolam (e) Vastram (f) Muktha, (g) Mani.

- In Susrutha Kalpa Sthanam Mentioned the Preparation of Some Herbs to be Sprinkled on to water
- The ASH (Bhasmam) of DHAVA, Aswakarna, Asana Paribadra, Patola, Siddhak, Makshika, Raja Druma and somavalka
- Shigruvadi Agada which should be given to Drink
- AJashrungi, Vishala, Vishagni, Uttamarani, PhaninJa, Prativisha are all to be burnt to Ash and this is Dissolved in water for Filtration Purpose
- Marol, Rajanidruma, Ela, Manjistha, Sunanda, Bakuchi where these drugs falls that place going to be detoxified.
- Patala, Panibadra, Aswakarna, Sonayaka, all put into a pot set on fire and mouth of the Pot in to be closed with a lid, The ash to be taken out than it is Sprinkled over the Poisoned water.

Land Purification Treatment

- According to Charaka Rasayana Therapy and Achara Rasayana is useful.
- Anantha, Suganthatriphala-water along with these herbs must be sprinkled.
- Also milk mixed with Soil is to be sprinkled over the Road.
- Usheera Moolam, Munaga (Drum Sticks), Soma, asafoteda to be mixed with little amount of curds and it is Administered to all.
- The Urine Flesh and blood of Goat, Sheep and elephants added with all the Fragrence Drugs are to be boiled with water and that water Sprinkled all over the Poisoned land (As.sut;8/38)**[10]**

Discussion

1. The IMP of sur. Kalpa Sthanam 6th Chapter-Dundhubhi Swaneeyem Kalpam-The Doctrine of the Sounds of Drums (of Anti Poisonous Virtues) one given IMP.
2. Herbs which are useful to Purify Air, Water, and Land one explained.
3. FORMS of Pollution are explained Nicely
4. Whole some and safe water Criteria explained
5. Importance of Epidemics are explained
6. The Controlling Methodology is Explained.
7. The Major Results with Ayurveda Herbs are explained
8. Sus.Kalpa sthanam 3rd and 6th Chapters are explained [9]
9. AS.SUT. 8th Chapters –Detoxification agents and Herbs are explained [10]
10. SUS. Sut 45th Chapter –water Purification Drugs are Mentioned.[11]
11. Important of Dundubhi Swaneeyem– Sus.Kalpa-6th Chapter Dusting of Powder and their Importance Mentioned and Discussed.

Conclusion

1. Create Greater Awareness of the threats of Climate Change
2. Sustainable Strategic Planning and funding is needed.
3. An affective, Sustainable response requires an assessment of Health risks, integrated action, Financial investment and Multi Spectral Collaboration required.
4. The Health Sector Needs to play a Critical Role in Mitigating Climate Change and in adapting to its Detrimental effects.
5. Personal training must be promoted, and measures for reducing green house gases must be implemented, as they can benefit health.
6. An increased financial allocation for health Programmes will be needed to Develop Comprehensive Plans for addressing the effect of climate change on human health.
7. If all Countries of the region make a Combined effort to tackle the effects of climate Change on Health, the resulting

evidence Base emerging best Practices and Lessons Learnt will make a Valuable Contribution to global Health.[12]

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