

Concept of Environmental Sanitation

แนวคิดเกี่ยวกับสุขาภิบาลสิ่งแวดล้อม

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ABSTRACT

Environmental sanitation refers to the protection of environment for keeping the human happy and free from disease. Both scientific and artistic principles are used to protect environmental factors that negatively affect human health and environmental quality. Environmental sanitation also involves a management of physical, chemical, biological factors and related factors that affect human health, as well as hygiene promotion and disease prevention associated with environmental factors. It operates under the principles of equality, intersectorality, public participation, democratic principles, international cooperation, environmental sanitation promotion, subsidiarity, sustainable development, precautionary

principle, and environmental rights and justice. The scope of environmental sanitation operations includes water supply for consumption, treatment and control of water pollution, waste management and waste management vector control, prevention and control of soil pollution, food sanitation, air pollution control, radiation protection, occupational health and safety, noise pollution control, sanitary shelter, urban planning, transport environment management, accident and emergency environmental management of recreation facilities, sanitation operations on outbreaks, emergencies, disasters and migration of population, and measures to protect general environment without risk and danger to human health.

Environmental sanitation operations operate under environmental and ecological relationships. They are essential for the control and prevention of pollution and pathogens, waste management and pollution caused by country development, and environmental improvement and control for good quality. An operation of environmental sanitation incurs an international cooperation and establishment of a network of operations across all regions and around the world to prevent and improve the deterioration of the environment, which caused by an increase of the world population, inappropriate use of resources, lack of natural resource and pollution management, inappropriate use of forest and land resources, lack of knowledge and awareness of waste management and waste generated from consumption. Finally, the policy development that does not cover the protection and remediation of natural resources and the environment is one of several factors contributing to the deterioration of the environment.

KEYWORDS: Environmental Sanitation

บทคัดย่อ

การสุขาภิบาลสิ่งแวดล้อม หมายถึง การระวังรักษาสิ่งแวดล้อมเพื่อให้มนุษย์ มีความสุขปราศจากโรค ด้วยการใช้องค์ความรู้ทางด้านศาสตร์และศิลป์ในการพิทักษ์ปัจจัยสิ่งแวดล้อมที่มีผลเสียสุขภาพของมนุษย์ และคุณภาพของสิ่งแวดล้อม และจัดการกับปัจจัยทางกายภาพ เคมี และชีวภาพ และปัจจัยที่เกี่ยวข้องที่มีผลกระทบต่อสุขภาพ รวมถึงการส่งเสริมสุขภาพและการป้องกันโรคที่มีความเกี่ยวข้องกับปัจจัยสิ่งแวดล้อมที่มีความสัมพันธ์กับสุขภาพของมวลมนุษย์ ที่ดำเนินงานภายใต้หลักการความเสมอภาค การบูรณาการ การมีส่วนร่วม หลักประชาธิปไตย ความร่วมมือระหว่างประเทศ การส่งเสริมสุขาภิบาลสิ่งแวดล้อม การเสริมอำนาจ การพัฒนาที่ยั่งยืน การป้องกันล่วงหน้า และสิทธิและความยุติธรรมด้านสิ่งแวดล้อม โดยมีขอบเขตการดำเนินงาน ในด้านการจัดหาน้ำเพื่อการบริโภคและอุปโภค การบำบัดและควบคุมมลพิษทางน้ำ การจัดการขยะมูลฝอย และสิ่งปฏิกูล การควบคุมสัตว์พาหะนำโรค การป้องกันและควบคุมมลพิษทางดิน การสุขาภิบาลอาหาร การควบคุมมลพิษทางอากาศ การป้องกันอันตรายจากรังสี อาชีวอนามัยและความปลอดภัย การควบคุมมลภาวะทางเสียง การสุขาภิบาลที่พักอาศัย การวางผังเมือง การจัดการสิ่งแวดล้อมทางคมนาคม การป้องกันอุบัติเหตุ

และเหตุฉุกเฉิน การจัดการสิ่งแวดล้อมของสถานที่พักผ่อนหย่อนใจ การดำเนินงานสุขาภิบาลเมื่อเกิดโรคระบาด เหตุฉุกเฉิน ภัยพิบัติ และการอพยพย้ายถิ่นของประชากร และมาตรการการป้องกันเพื่อให้สิ่งแวดล้อมโดยทั่วไป ปราศจากความเสี่ยงและอันตรายต่อสุขภาพอนามัยของมนุษย์

การดำเนินงานการสุขาภิบาลสิ่งแวดล้อมเป็นการดำเนินงานภายใต้ความสัมพันธ์ของสิ่งแวดล้อมและระบบนิเวศซึ่งมีความสำคัญที่เป็นการดำเนินการเพื่อควบคุมและป้องกันมลพิษและเชื้อโรค การจัดการของเสีย และมลพิษที่เกิดจากการพัฒนาประเทศ การดำเนินงานเพื่อปรับปรุงและควบคุมคุณภาพสิ่งแวดล้อมให้มีคุณภาพเหมาะสม การสุขาภิบาลสิ่งแวดล้อมเป็นการดำเนินงานที่ก่อให้เกิดความร่วมมือระดับนานาชาติ เกิดภาคีเครือข่าย การดำเนินงานทั่วทุกภูมิภาคและทั่วโลก ในการป้องกันและปรับปรุงการเสื่อมโทรมของสิ่งแวดล้อมอันมีสาเหตุมาจากการเพิ่มขึ้นของประชากรโลก การใช้ทรัพยากรที่ไม่คุ้มค่า การขาดการจัดการทรัพยากรธรรมชาติและมลพิษ การใช้ทรัพยากรป่าไม้และที่ดินที่ไม่เหมาะสม ประชากรโลกขาดความรู้ ความตระหนักในการจัดการของเหลือใช้และของเสียที่เกิดขึ้นจากการอุปโภคบริโภค และการกำหนดนโยบายในการพัฒนาประเทศไม่ครอบคลุมการปกป้องและเยียวยาทรัพยากรธรรมชาติและสิ่งแวดล้อม

คำสำคัญ: สุขาภิบาลสิ่งแวดล้อม

Introduction

Environmental sanitation is supporting health management systems to meet the goal of sustainable development. It is focusing on implementation of environmental conditions, making population healthy, controlling and preventing diseases that cause from environment of a community to residential housing as a physical environment, biological environment, and chemical environment, including management and technical planning for environmental sanitation in communities and localities.

Definition of Environmental Sanitation

Sanitation means a cure for disease-free happiness. (Office of Environmental Health, 2015) Environment means everything

around us with all living and non-living thing, substantial (tangible and visible), and abstract (culture, traditions, beliefs) influence on each other. They were a factor supporting each other. The impact of one factor will inevitably contribute to or destroy another. The environment is a cycle involved in the whole system. (Office of Environmental Health, 2015).

Environmental sanitation refers to a relationship between human health and environment with science and arts. It is controlling negative factors of the environment that affect human health and quality of the environment. It is managing of physical, chemical, biological, and relevant factors that affect health, include promotion of hygiene and prevention of diseases

associated with environmental factors, such as waste disposal, sewage, residence, and water. (Office of Environmental Health, 2015; World Health Organization, 2014).

In summary, environmental sanitation means environmental protection using scientific and artistic principles to protect human from diseases. It is preventing negatively environmental factors that affect human health and quality of the environment dealing with physical, chemical, biological factors, and related factors, including the promotion of hygiene and prevention of diseases associated with environmental factors that relate to human health and happiness.

Foundation Principles of Environmental Sanitation

The basic principles of environmental sanitation are 10 elements; as follows (Conant & Fadem, 2012; Fitzpatrick & Bonnefoy, 1998; Sukhothai Thammathirat Open University, 2016)

1. Equity; It is empowering people and community to have equal choices of living and working.

2. Intersectorality; It is coordinating agencies of working in the same field, but different interests or goals to work, prevent, and solve problems together.

3. Public Participation; It encourages people in the community, community organization to be strong, to take a role

and join the decision-making process, and evaluation with the leading organization to work.

4. Democratic principles that take into account the rights and duties of people in the community through participatory processes in all processes, including the right to make decisions.

5. International Cooperation; Environmental sanitation is not limited to one area. Some environmental sanitation issues are a global problem. International cooperation is an important mechanism to work together to solve the problem of environmental sanitation.

6. Principles of Environmental Sanitation; Environmental Sanitation Promotion is a measure of knowledge for promoting and preventing problems, including research to obtain specialized knowledge for use in solving environmental sanitation problems.

7. Subsidiarity; Subsidiarity is an empowerment that empowering people or organizations to make effective environmental sanitation decisions in the field of problem analysis, priority and sustainable management.

8. Sustainable Development; Sustainable Development is a prerequisite for the implementation of a prudent framework and covering impact of the environment on people's health at all levels of the country.

9. Precautionary Principle; Precautionary Principle is preventing the impact of environment on health in advance under the correct health and environmental information.

10. Environmental Rights and Justice; Environmental Rights and Justice are everyone in community and society has the right health, environment, benefits in healthy and equal quality of life

Scope of Environmental Sanitation

Environmental sanitation is a work that focuses on preserving the quality of the environment and contributing to the well-being of human life. The scope is as follows. (World Health Organization, 2014)

1. Water Supplying: Provide safe and sufficiency to a community.

2. Water Quality: Treatment of water pollution, controlling water quality and prevent waterborne disease in various water sources such as canals, swamps, canals, rivers, and groundwater.

3. Waste and Sewage Management: It is systematic management of storage, transport, and disposal that is sanitary, because of waste and sewage as a source of germs and carriers.

4. Vector Control: Insects and rodents are carriers of communicable diseases such as cholera, malaria, etc. They also cause nuisance and destruction of important property.

5. Soil Quality: Prevention and control of soil pollution that contaminates waste and heavy metal substances. They cause harm to plants, animals, and impact on human life.

6. Food Sanitation: Cooking, food storage, food handlers, and provide food sanitation knowledge were important factors to prevent and control pathogens and toxins of foodborne diseases.

7. Air Pollution: Control and prevents foreign substances cause harm and effect to humans, animals, and plants.

8. Radiation Protection: Prevention and control of radiation hazards that from agriculture and medical industry. These radiators cause harm to human health.

9. Occupational Health and Safety: Management of working environment, protection of occupational health care and control of the physical, chemical and biological hazards in the occupation.

10. Noise Pollution Control: Control the sound level that harmful to human health.

11. Residence Sanitation: Housing management, cleaning, beautiful and safety housing to physical and mental health.

12. Urban Planning: Area management, reasonable and proportional area. It consists of industrial, business, and residential area. Area management is controlling and preventing traffic and environmental problems that cause to physical and mental health.

13. Transport Environmental Management: Sanitary management of land, water, and air traffic, covering vehicles and stations to control communicable diseases.

14. Accident and Emergency Management: Public health management system to reduce the rate of illness and death from various accidents.

15. Environmental Management of Recreation Facilities: Quality resting place management to promote human health and prevent a source of disease, emergencies, and disasters.

16. Epidemic, Emergency, Disaster, and Migration Sanitation Management: Quickly control and prevent the outbreak of an epidemic, emergency, disaster, and migration.

17. General Environmental Protection: Management of general environment to protection and reduce the risks and harms to the human health.

Environmental sanitation operations of any area or region are cover or focus on any side to depend on the environmental sanitation issue of the area or region. Thailand, which is a developing country, faces on almost every aspect of environmental sanitation. Including new environmental sanitation issues of modern technologies that threaten the health of people is inevitable.

Types of Environment

The environment can be classified by components and features are as follows.

1. Classified by environmental elements are four types as follows.

1.1) Physical Environment refers to characteristics of the environment with elements that can be touched by the body such as taste, smell, sound, air, soil, water, wind, etc.

1.2) Chemical Environment refers to environmental features that contain chemicals such as minerals, metals, nonmetals, chemical compounds, etc.

1.3) Biological Environment refers to environmental features with elements of the life of microorganisms, plants, and animals as well as humans. Human beings play an important role in helping to sustain and to destroy the environment with each other.

1.4) Social Environment refers to the environment that relevant to human well-being in terms of living in society, including customary and traditional customs such as religious traditions.

These four types of environment to be not occur alone. They need to have a mutual relationship to sustain human life as well as other creatures.

2. Classified by generates are two types as follows.

2.1) Natural Environment refers to Naturally occurring environments such as soil, water, microorganisms, plants, and animals.

2.2) Man-made Environment refers to the environment that generates by human such as food, medicine, equipment, appliances, machinery, electrical appliances, and etc.

3. Classified by life are two types as follows.

3.1) Biotic Environment refers to the environment that a life such as Microorganisms, plants, and animals, as well as humans.

3.2) Abiotic Environment refers to the environment without properties of life that can happen naturally or man-made such as Water, lighting, machinery, appliances, consumer goods, etc.

Environmental Sanitation and Ecology

The environment whether in any form or by any group include natural environment, man-made environment, physical, chemical, biological, or social environment. It is necessary for human living as well as other living things to, directly and indirectly such as food, air, water, etc. It is also necessary for human activities to include housing, work, vehicles, etc. At the same time, the effects of various use the relation to the human environment both

in living and doing activities. As a result, the environment becomes degraded or depleted. Eventually, it could become a dangerous waste to humans and other organisms. (Office of Environmental Health, 2015).

The environment that promotes or supports life means environment or system of the necessary environment, which is the basic human need to carry out activities such as energy, geophysics for human activities, include the use of resources and turn to residues and wastes by type of activity. Residues and wastes are mostly useless for humans. If recovery waste, it does not cost saving, limits to reuse, causes trouble, and uncomfortable for the user. In addition, waste or some kind of waste can be dangerous or maybe a hazardous environment such as germs, toxic substances, and etc. (Chankaew, 1991).

Environment or environmental systems may be harmful to organisms such as Microorganisms, plants, and animals (including humans) or damage to other resources. This dangerous environment can be caused by nature as Flood, volcanic eruptions, earthquakes, thunderstorms, etc. or the activities of living organisms, especially from humans as waste, sewage, wastewater, air pollution. In addition, humans and the environment are both directly and indirectly related and relationships may be simple or complicated. Relationship between

environment and organism (Including humans) refer to “Ecology” (Chankaew, 2001; Mara, Lane, Scott, & Trouba, 2010)

1. Meaning and Type of Ecosystem

Ecology means the relationship of living environment elements and the non-living environment in a part of the ecosystem. They are the role to play in building relationships in coexisting maybe large or small area and scope. There is a system of exchanges of nutrients and energy that can be controlled by one another to support balance of the ecosystem. It may be related to a nearby ecosystem. The ecosystem consists of living organisms, or a group of organisms exists a little more, and each type of housing demand varies by nature of environment such as humans also need primary residence on the ground, fish need primary habitat in water, etc. The ecosystem is different in terms of size as zodiac is a big size (the world) to animalcule is a small size (microorganism). Ecosystems can be classified as follows. (Chankaew, 1991).

1.1 Natural and semi-natural ecosystems. The system that requires the sun or the sun to be a source of energy: such as follows.

1) Aquatic ecosystems

Various organisms in the water habitat rely on water plants as a conductor of solar energy. It is divided into two sources.

- Marine ecosystems include the sea and ocean.

- Freshwater ecology includes of river, canal, creek, swamp, reservoir, etc.

2) Terrestrial ecosystems

Land Ecosystems where various organisms are living on the land. They rely on energy from the sun. It is divided into two sources.

- Wetland Ecology: mangrove forest.

- Ecology on land: rainforest and mountains.

1.2 Urban Industrial Ecosystems.

It is a re-created ecosystem and generates more power as electric power and energy from various fuels.

1.3 Agricultural Ecosystems. It is an ecosystem that people changes to increase natural energy to be sufficient for life in the system.

2. Elements of Ecosystem

There are 2 categories of ecosystems' elements.

2.1 Abiotic Component have three types as following

1) Inorganic such as minerals, soil, rock, etc.

2) Organic such as fossil, nutrient, etc.

3) The Physical environment such as light, temperature, etc.

2.2 Biotic Component have three types as following

1) Producer, it can transform light to be food or any energy such as small

plant and big green plants. The producer is important because it is a begin place and a connector between living and alive in other ecosystems. We also call this type as Autotrophic Component.

2) Consumer, they cannot produce energy by themselves, and they must eat plants or animals.

- Herbivorous, the primary consumer such as cow, buffalo, elephant, horse, etc.

- Carnivorous, the secondary consumer such as bear, lion, tiger, etc.

- Omnivorous, the Tertiary consumer such as human, etc.

3) Decomposers, they cannot cook and they need to digest from the other components. We also call them Heterotroph or Saprotroph such as bacteria, fungus, etc. They are important for plants.

Another component in ecosystems has a various relation such as human eat fish, fish eat aquatic plant and then bacteria digest waste from the human that we call food network. Energy from ecosystems will be an endless cycle that is the balance of ecosystems. If there is something stop or obstruct this cycle such as producer is not enough for the consumer, it will make an unbalance to systems and then the result is damage of relation between human and environment that brings the problem of human health. (Chankeaw, 2001)

Importance of Environmental Sanitation

We can classify the Environmental Sanitation as following;

1. Environmental sanitation is an operation to control and pollution protection because human is part of the environment then the environment is influenced with human life. Pollution and pathogen overspread around us. They also affect health and human life quality

2. Environmental sanitation is an operation to manage waste and pollution that come from country development. Every country in the world develops their community with rapid high technology such as industry, agriculture, services and energy for their future and economic, social and convenience for their citizen. If they did not do the wage management and pollution with the appropriate method, it would do effect to environment and health of their citizen.

3. Environmental sanitation is an operation to improve and quality control environment to make the proper quality, did not assassinate living thing and human living.

4. Environmental sanitation also establishes world cooperation that operates around the world because the environment is not a specific place then the environmental problem is the same with everywhere in the world.

Causes of Environmental Decadence

Cause of environmental decadence as following; (Verawatthanant, 2003).

1. Rapidly increasing of the world population, it caused to consume the limited world resource with a large amount to support human need.

2. Lack of resource and environmental pollution management that affect ecology.

3. Inappropriate management for land and forest such as the establishment of industry zone in the land that has plentifully compound for agriculture.

4. Lack of knowledge and awareness of waste management in daily life when it comes to be the environmental pollution.

5. The country development policy: It is not covering the issue of protection and treat the natural resource and environment.

Present, the causes of these degraded environments are severing to emerging and recurrent diseases. They are an outbreak in various parts of the world. Many areas are not controlling and protecting promptly because less of sanitation principle practices.

Conclusion

Environmental Sanitation is the activities that take care of the environment, aim at human happiness without disease with science and art to manage environmental factors that have a negative effect on human. The physical, chemical, and biological factors management and factors that affect

to the health and to promote the hygiene and disease protection that involve the environmental factors and relate with human health. It's operated under the 10 basic environmental sanitation principles 1) equality, 2) integration, 3) participation, 4) democracy, 5) world cooperation, 6) environmental sanitation promotion, 7) potential, 8) sustainable improvement, 9) advance protection, and 10) right and justice in the environment. They have 17 operations framework as following; 1) provide for water supply consumption, 2) water pollution treatment and control, 3) waste management, 4) animals as carriers of disease control, 5) ground pollution protection, 6) food sanitation, 7) air pollution control, 8) radioactivity protection, 9) occupational health and safety 10) sound pollution control, 11) accommodation sanitation, 12) city planning, 13) transport environment management, 14) accident and emergency protection, 15) environment management for playground, 16) sanitation management when epidemic, emergency accident and citizen evacuation, and 17) protection principle for environment without human health risk and hazard.

Environmental Sanitation operate under the environment and ecosystems relation that is very important as following; 1) to control and protect the pollution and pathogen, 2) To manage waste and pollution that is the result by country development,

3) to improve and control the environment, and 4) Environmental Sanitation also sets up world cooperation that operates around the world, because of the rapid increase of world population, unappropriated management, lack of natural resource and pollution management, lack of knowledge and awareness of waste management in daily life, the country development policy is not cover the issue of protection and treat the natural resource and environment.

Recommendation

Environmental Sanitation operates under the environment and ecosystems relation that is very important as following; 1) to control and protect the pollution and pathogen, 2) to manage waste and pollution that is the result by country development, 3) to improve and control the environment, and 4) environmental sanitation also set up world cooperation that operates around the world, because of the rapid increase of world population, unappropriated management, lack of natural resource and pollution management, lack of knowledge and awareness of waste management in daily life, the country development policy is not cover the issue of protection and treat the natural resources and environment.

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