

The Effect of Natural Radioactive Elements in the Soil and Ground Water Toward Human Beings

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Abstract: The new study was assessed the effect of naturally radioactive elements in soil and water to ward human being. The most of the world's coverage was of radioactivity element exist in water and soil surface. Natural radioactive material such as ^{238}U , ^{232}Th , ^{238}U , and ^{40}K , are of major concern to emit ionizing radiation. Water is one of the vastest natural resources. The amount of naturally occurring radioactivity in the country's soils, and groundwater is associated in its occurrence. The soil and water sample were technically distinguished by using advanced instrument high-purity germanium gamma-ray detector. Natural radioactivity and radiation in soils and water have gained substantial works attention because humans are exposed to natural radioactivity at different levels depending on natural radioactive materials were presented throughout in country. The aim of the current work was to know the risk of radiation and forward the scientific information to the researchers. The main source of ionizing radiation that pollutant the soil and water was occurred in nature. In this work have focused the property and associated between the source of emitting ionizing radiation with target sample. It seen that the consequence of determinant and somatic effect. The study was also assessed the producer of radionuclide exposed to the peoples.

Keywords: Radiation, Radioactivity, Environments, Effect and Exposure

1. Introduction

Natural radiation is a normal part of the environment that originates from two main sources [1]. Naturally Occurring Radioactive Materials are radioactive materials which occur in nature [2]. NORMs are categorized of radionuclides: primordial or terrestrial, biological, and anthropogenic, and they are distributed everywhere in the environment [3]. Natural radioactivity and the associated external exposure due to gamma radiation are largely determined by environmental and topographical conditions, and appear at various quantities in soils [4]. The levels of radioactivity can be used to assess public dose rates and radioactive pollution and predict changes in natural radioactivity caused by nuclear accidents, manufacturing activities, and other human activities [9]. The increasing need for radioactivity and its applications has caused an assessment of human radiation exposure [12]. Even with wide concern in the amount of natural background radiation and the scope of nuclear advances, the level of natural radioactivity for most of its environments is not being established [11]. The most of

studies on environmental radioactivity focused on measuring natural radionuclides in soil and water trials for specific locations and reported comparatively higher radioactivity levels. This review aims to assess baseline data on natural radiation and radioactivity levels of soil and water in the environment. The assessment of this work also used scientific baseline data on the levels of natural radioactivity in the area for monitoring and determining any future radiation contaminations in the environment due to local accidental releases or those on a global scale. Such data can also be used to assess the radiological health effects of natural radiation in the environment and can be used to approve, and to plan decisions about possible radiation linked health problems in the area [5]. It also evaluates the contribution of natural radioactivity and radiation risks to residents of the area [10]. To distinguish between the levels of usual radioactivity in some soils and the possible effect on groundwater radioactivity [7]. Soil was scooped at certain places, while rock pieces were chipped from out crops [6]. Radioactive particles enter the environment from a range of problems and exhibit a lot of aspects [13]. The environmental

consequences of these particles is linked to their physicochemical forms and weathering effects [8].

2. Literature Review

2.1. Radiation in the Environment

Radiation exposure is an unavoidable part of life of individuals. Aside of medical care, everybody is exposed to ionizing radiation in their daily life. The majority of our daily radiation exposure comes from radionuclides carried over from the creation of all matter billions of years ago [14]. The methods generate radioactive elements some of which are widely dispersed in the environment. This has led a life of polluted water supplies, developed farm land, and soil

producing exceedingly high levels of naturally occurring radioactive elements and ionizing radiation interactions in the environment. This leads to a variety of biological effects, that can later manifest as a medical symptom. The nature and seriousness of the symptoms is determined by absorbed dose as well as the rate of many illnesses and diseases that can be effectively managed if information about an environment's radiation level is effective. Only radioactive elements with half-lives comparable to the earth's age or their corresponding decay products present in terrestrial material, such as ²³²Th, ²³⁸U, and ⁴⁰K, are of major concern in this study. Since this radioactive element is not evenly distributed in soils and water, it plays an important role in radiation protection and measurement [16].

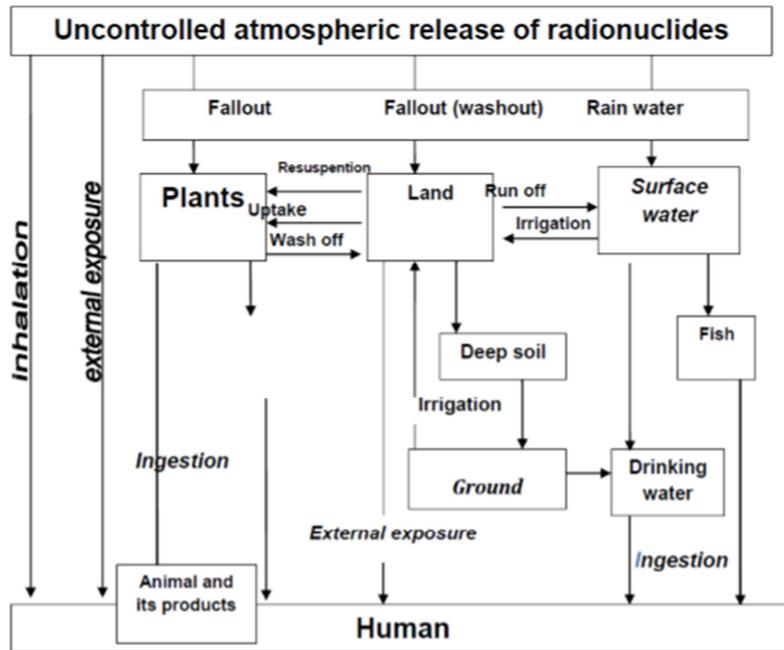


Figure 1. The diagram show that radionuclide exposure to human being [14]

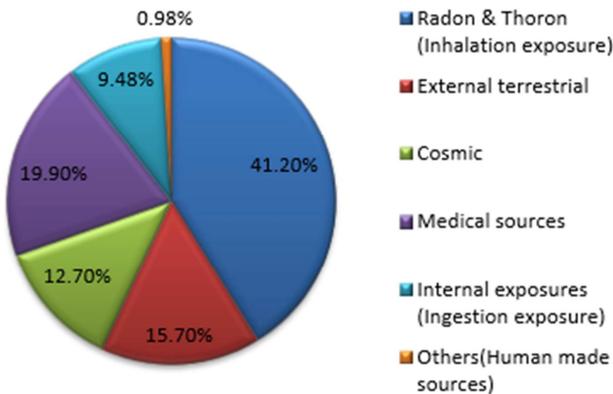


Figure 2. A chart on human exposure to sources of radiation [15].

Soil is an important resource to human. It can be used for food production and building shelter. The chemical, mineral and biological components of soil can be inhaled, ingested or absorbed through the skin, hence can be harmful to human

health, for example cancers due to inhalation of radon gas from the decay of uranium in soil minerals, radiation sickness and sterility [15].

2.2. Biological Effects of Ionizing Radiation

Radioactive materials and ionizing radiations are existed naturally in our environment. The radiation exposure hazard cannot be removed entirely but can only be restricted. The two categories of detrimental health effects that can be caused by exposure to radiation are deterministic and stochastic.

2.2.1. Deterministic Effects

These are effects that can occur once a threshold level of exposure has been exceeded. The threshold can be small and may vary from one person to another. However, on exceeding the threshold, the severity of an effect increases with increase in dose. Deterministic effects include skin erythema, sterility, hair loss, cataracts and fetal abnormality. Deterministic effect results

from delayed cell division or cell death, due to exposure to very high radiation levels. These effects can weaken the function of the exposed tissues if they are extensive enough [11].

2.2.2. Stochastic Effects

There are quite long-term effects of radiation exposure. This increasing amounts without a threshold level, and also over a wide range of doses. Stochastic effects may occur if an irradiated cell is altered. Over just a long period, the modified cells may develop into cancer. This may not occur at low doses due to the body's repair mechanisms; although, there is no dose below which cancer cannot occur. The cancer risk occurring at higher doses is increased, but the severity of any cancer that may result from irradiation is reduced by dose. The risk of stochastic effects increases in response to the dose [15].

3. Conclusion

The present work in this review were the assess the effect of radioactive elements on human being causing by soil and water pollution. The effect of ionizing radiation stochastic effects and determinant effect on the gene of human cell. Most of naturally radioactive element occurred in soil, and water surface. Natural and man-made materials were the main source of radiation. The radioactivity concentration of soil samples collected around the world was assessed by gamma spectrometry. The level of suffering caused by people's exposure to external gamma radiation, radioactivity in soil, and ingestion in groundwater were assessed.

Author Contribution

B. Z. K wrote this article to assess and gave information the effect of natural radioactive material within soil and water toward human being.

Conflicts Interest

The author declared no conflict interest.

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