Chapter 12
Agricultural Health and Safety Measures by Fuzzy ahp and Prediction by Fuzzy Expert System:
Agricultural Risk Factor

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ABSTRACT

Farming is an ancient traditional business, but still it is not a profitable business sector due to risk factor attached to it. It is a high-risk business. Although profit is lucrative, loss rate is also high. Occupational safety is a big issue of discussion for agricultural workers. The methods of working in field in extreme climate (heat, rain) totally depends on environmental factors. Due to rain and droughts, the loss of profit impacts on economic condition and market. Extreme weather condition, heavy workload during their working procedure gives them early old age, bone and muscle problems. So to attain better efficiency of performance and to improve productivity of the worldwide farmers in the agricultural sector it is essential to minimize risk factors. Agricultural workers need sufficient precaution and safety measures at the time of field and machine work to minimize risk factors. Still risk is major discussion topic in agricultural business. So, an effort is taken to prioritize safety majors by fuzzy ahp, and prediction are done by fuzzy logic modelling.

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INTRODUCTION

Agriculture assumes an imperative role in the development of Indian economy, and it additionally contributes around 15% to the nation's GDP, offering work chances to around half of its population. Diverse devices and supplies implied for farming machines are utilized in farming processes which are either manually or mechanically operated. In spite of the fact that there have been advancements in new technologies, still sustainability is the most important issue in farming. Now a days modern farming process and advanced machineries have solved OHS(occupational health and safety) problems of farming .But modern equipment smoke, dust, chemicals and fertilizers both in manual driven farming and modern farming are major environmental issue. Sustainability is a very critical issue in farming, if the farming is traditional manures of animal waste is used instead of chemicals and fertilizers to improve farming prouctivity. But use of wastes of animals also creates pollution. Two of the many possible practices of sustainable agriculture are crop rotation and soil amendment, both designed to ensure that crops being cultivated can obtain the necessary nutrients for healthy growth. Soil amendments would include using locally available compost from community recycling centers. These community recycling centers help produce the compost needed by the local organic farms. *Sustainable agriculture* is a type of *agriculture* that focuses on producing long-term crops and livestock while having minimal effects on the environment. This type of *agriculture* tries to find a good balance between the need for food production and the preservation of the ecological system within the environment.

The utilization of genetically modified crops and Organic farming will improve the fertility of land and improve the crop production rate of Indian farmers. But still the small and medium agricultural sector are very poor and neglected and are following the traditional method of crop production. Risk and uncertainty are inherent to agriculture. The most common sources of risk factor are weather, climate, diseases, natural disasters, and market and environmental factor shocks. Other risks relate to logistics, infrastructure, public policy, the political situation and institutions. Some risks have become more severe in recent years due to climate change and the volatility of food prices. Smallholder farmers' livelihoods are especially vulnerable. They may find difficulty and organization of risks, and fail to get benefit from investment opportunities that could progress their farming businesses and strengthen household resilience. Farmers live with risk and make decisions every day that affect their farming operations due to change in weather conditions, dropping of prices at the time of harvest, availability of hired labor at peak times, machinery and equipment break down when most needed, draught animals death and change in government policy overnight. All of these changes are examples of the risks that farmers face in managing their farm as a business. All of these risks affect their farm profitability. Heavy rains and drought without rain could also damage or even wipe out crops. Another source of production risk is equipment. A farmer's tractor may break down during the production season resulting in an inability to harvest in time, thus affecting yields. Marketing risk and variation in prices are beyond the control of any individual farmer. The price of farm products is affected by the supply of a product, demand for the product, and the cost of production. The technology, assets and labor or human factor is also very important issue. Contacts and exposure with the chemicals & fertilizers, the exposure to soil & dust, the contamination due to bacteria, exposure to animals, injury due to hand tools and muskulateral disorders are the most important injuries faced by all agricultural workers. Indian agricultural business sector is expected to be the most important driver of Indian economy within few years because of high investments for agricultural facilities, warehousing and cold storage. The utilization of genetically modified crops and organic farming will improve the fertility of land and improve the crop production rate of farmers.