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MEDITATIVE FUZZY LOGIC AND AGRICULTURAL PRODUCTION PLANNING: STATE LEVEL INVESTIGATION OF WHEAT CROP IN INDIA

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Abstract: Wheat is the second most dominant food grain cultivated in India and also a major source of food security for the nation. After the Green Revolution, this crop witnessed remarkable growth. But, in the mid-1990s, doubts about the sustainability of its growth performance started cropping up. Consequently, methods to enhance the production through the best utilization of agricultural inputs were considered and Meditative Fuzzy Logic (MFL) was found to be a suitable method for incorporating agricultural production planning at crop level. Meditative Fuzzy Logic deals with inconsistent information; wherever a contradiction exists. Herein, MFL is used to construct an appropriate production planning technique to suggest increase in the productivity in wheat farming, by including eight input factors for five major states. The results clearly reveal that if agricultural inputs are used according to MFL technique, then output (productivity) of wheat crop will be much better as compared to existing productivity.

Key words: Agricultural, Wheat crop, Meditative fuzzy logic, Inputs function and productivity.

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1. Introduction

Most of the population in developing countries like India is directly dependent on agriculture sector for their food and nutrition requirements. After the rice crop, wheat is the staple food in India. This crop has an important role for achieving food security in India through 'Green Revolution'. Uttar Pradesh, Punjab and Haryana are the main producer states of wheat crop. Due to surging population levels in India, there is a need to improve the agricultural production capacity from both economic and social point of view. Recently, sustainability of agriculture sector in India has been a great challenge for farmers, policy makers and academicians. Moreover, the farmers are facing different kinds of problems during the current era which need to be contextualized. Therefore, there is a need to build up mathematical models in farming practice for taking decisions to achieve optimum crop production in vague context. Meditative Fuzzy Logic (MFL) is one

such suitable method for incorporating agricultural production planning at crop level.

Nowadays, ambiguity, doubtfulness, oscillation and uncertainty constitute an integral part of every decision making problem. Zadeh (1965) gave an idea to remove this kind of uncertainty or ambiguity, with the help of fuzzy logic by using membership grade/values. However, there are some cases in which human judgment plays a key role and wherein we are left with more than two answers like; "Yes" or "No" or "I cannot say" or "I do not know" etc. In order to accommodate Atanassov (1986) proposed intuitionistic fuzzy logic. This was an extension of fuzzy logic, which deals with membership as well as non-membership grade/values. intuitionistic fuzzy logics have the capability to handle the uncertainty caused by membership, non-membership and hesitation part of the situation. Hence, in many aspects, intuitionistic fuzzy logic is better than traditional fuzzy logic. Further, Atanassov and Gargov

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