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Editorial

Bringing Order to Complex Decisions through Analytic Hierarchy Process

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The present-day environment of agricultural development, extension delivery and government policy is becoming more and more complex, uncertain and with multiple objectives. Many decisions involving the distribution of technology, allocation of resources, adaptation to climatic changes, well-being of farmers and restructuring of institutions are no longer linear and one-dimensional, nor are they primarily based on one objective. The agricultural extension community, policymakers and social scientists are faced not only with the problem of making productive decisions but also with the problem of ensuring that these decisions are rational, optimum and amenable to human rationality. It is in this environment that the Analytic Hierarchy Process (AHP) has emerged as an influential tool in decision making, providing a systematic but flexible approach that is tempered by mathematical models and the nature of human perception. It was developed by Thomas L. Saty in the 1970s.

Fundamentally, the conceptual basis of AHP is rooted in the concept of hierarchy, which is a cognitive aid by means of which people naturally think in a hierarchical or hierarchical-offered systematic way to deal with complex realities. It has a three-level hierarchy, i.e., the Goal, evaluation Criteria and available Alternatives. The available alternatives are to be selected based on the preferred criterion and the alternative best suited to the situation. It relies on pairwise comparisons of decision criteria and alternatives, using a numerical scale to quantify subjective judgements. The scale ranges from one (equal importance) to nine (extreme importance) and allows decision-makers to express their preferences consistently and in a structured manner [1]. Already in the context of agricultural extension work and policy, the hierarchical pattern of thought is at work, where the broad objectives of development, namely sustainability, productivity, or security of means of livelihood, are sought to be achieved by several criteria including, but not limited to, economic viability, environmental components, social acceptability, or institutional ability and backed by specific intervention or alternative options, whereby the ambiguous nature of the complex situations in agriculture is given a manageable format through AHP.

One of the greatest strengths of AHP as a research methodology in agriculture and the social sciences is its ability to deal with subjective and intangible aspects of decision-making. Key factors such as farmer perception, attitudes, risk preference, trust and usefulness of technology may not have objective or quantitative

measures and may be very inconsistent. Most traditional approaches consider objective and quantitative data, complete information and stable preferences, which are not very realistic, particularly in rural and policy context situations. The AHP method removes such weaknesses by making use of pairwise comparison, whereby the expert, policymaker, or researcher makes his/her judgments relatively, thus making subjective judgments compatible with objective analysis by converting judgments into ratio scales through the basic scale, which provides ample opportunity to learn and learn from inconsistencies inherent in subjective judgments [2].

But apart from the calculations involved in the solution of problems, the major analytical power of the AHP in agricultural extension and policy analysis lies in structuring the decision situation. Identification of factors such as cost, adoptability, scalability, environmental sustainability and institutional support, together with awareness of who the players are in agricultural extension, including farmers, agricultural extension workers, researchers and policy makers, is far more important than the calculations. An appropriate hierarchy allows for an understandable way of showing how the decision situation is, with all the trade-offs and interdependencies inherent in agricultural systems. It allows for homogeneity in comparisons in a way that is important when dealing with different factors such as economics, society and environment in one situation.

As far as social science methodology is concerned, AHP provides an appropriate and meaningful revival of rationality. Instead of identifying rationality with mere optimization or forced consistency, rationality is defined within AHP as the clarity and adequacy of purpose, information, judgment and openness towards diverse perspectives. This is especially important within the context of participative extension planning and policy formulation, where decision-making needs to address various actors and their sets of priorities. AHP also has applications that are independent of decision-making and are related to the design and measurement of research, especially in social research and extension research. In the design of a psychometric scale, often situations arise whereby the weights corresponding to different dimensions and the retention of the number of items under different dimensions are unclear. AHP can be applied in this area as it will allow the researchers to assign weights to dimensions and sub-dimensions systematically. For instance, while conducting a policy analysis, AHP can be applied to identify the ranking of interventions as well as trade-offs between the cost and benefit. While conducting extension research, it can be applied to identify the ranking of different technologies, communication, or capacity-building.

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