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Early Cognitive Mapping of Responses to Vedic–Modern Farming Integration: A Mind Genomics Study with Synthetic Respondents

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Abstract
This exploratory Mind Genomics study examined how individuals cognitively interpret the integration of Vedic agricultural principles with modern scientific farming. In an initial discovery phase, 48 synthetic respondents evaluated 24 systematically constructed vignettes generated from 16 elements capturing emotional reactions, practical considerations, social influences, and conceptual interpretations of blended Vedic–scientific farming. Synthetic respondents were intentionally employed as a pre-field step to map early cognitive patterns before empirical validation with real farmers. Ratings were binary-transformed and analyzed using Ordinary Least-Squares regression and clustering techniques, revealing three distinct mind-sets: (1) Practical & Clarity-Focused, emphasizing feasibility and implementation clarity; (2) Future-Optimistic & Science-Aligned, responding to sustainability and long-term agricultural promise; and (3) Tradition-Oriented & Socially Influenced, motivated by community endorsement and cultural continuity. Although Mind Genomics typically supports development of a Personal Viewpoint Identifier (PVI), a valid PVI could not be constructed in this phase because synthetic respondents do not reflect authentic psychological variation. Instead, the study establishes a conceptual framework for future field research. These findings provide an early cognitive map that may inform agricultural communication strategies, extension programs, and subsequent empirical investigations involving real farming communities.

Keywords: Mind Genomics, Vedic Agriculture, Cognitive Mapping, Sustainable Farming, Farmer Decision-Making.

Introduction

Agriculture in India has historically functioned not only as a means of food production but as an integrated knowledge system embedded in ecological balance, cultural ethics, and experiential science. Classical Sanskrit literature portrays farming as a disciplined and methodical practice central to societal well-being. Historical analyses indicate that early Vedic society conceptualized agriculture as a structured science involving soil management, seasonal alignment, plant vitality, and responsible resource use [1]. This orientation is reflected in specialized treatises such as Suprapāla's Vṛkṣāyurveda, which documents seed treatment, organic manures, plant-protective formulations, and principles of environmental harmony, illustrating how ancient scholars framed agriculture as an ecologically aligned system [2]. In contemporary discourse, several Vedic agricultural principles—such as cow-based soil amendments, biological pest regulation, and cyclical cultivation—are receiving renewed scholarly attention for their potential sustainability benefits [3]. Recent analyses further highlight that the Rigvedic worldview regarded agriculture as a foundation of prosperity, cultural continuity, and ethical responsibility [4]. In the context of present-day environmental challenges, including soil degradation, climate variability, and sustainability pressures, interest in culturally rooted yet ecologically responsive farming models has intensified. These perspectives suggest that integrating Vedic agricultural knowledge with modern scientific methods may offer resilient and context-sensitive pathways for agricultural innovation. Despite this growing interest, little is known about how individuals cognitively interpret the idea of blending traditional Vedic principles with contemporary scientific agriculture. Agricultural adoption is not driven solely by technical outcomes; it is strongly influenced by psychological, social, and perceptual factors. Diffusion of innovations theory emphasizes the importance of perceived usefulness, complexity, and compatibility in shaping innovation uptake [5]. Economic models of adoption similarly highlight risk perception, expected profitability, and feasibility as central determinants of farmer decision-making [6]. Social learning theory further underscores the role of modeling, peer influence, and trusted intermediaries in shaping behavioral change [7]. Empirical research in agricultural systems confirms that knowledge exchange, advisor trust, and community networks significantly affect farmers' willingness to adopt new practices [8-9]. Together, these theoretical and empirical insights indicate that understanding cognitive responses to Vedic–modern farming integration requires more than agronomic evaluation; it requires systematic mapping of how individuals emotionally, practically, and socially interpret such blended approaches. Mind Genomics provides a structured experimental framework for accomplishing this task. Rather than eliciting general opinions, the method decomposes complex concepts into discrete message elements and quantifies their independent influence on judgment [10]. By identifying distinct micro-mindsets—clusters of individuals who interpret the same information differently—Mind Genomics has been applied successfully in domains such as food perception, consumer behavior, and health communication [11]. However, it has not previously been used to explore cognitive interpretations of Indian agricultural systems or the integration of Vedic and modern farming paradigms. The present study addresses this gap by applying Mind Genomics to examine how message elements related to Vedic, modern, and blended agricultural practices are interpreted in an exploratory simulation phase. By mapping early cognitive patterns and identifying emergent mind-sets, the study establishes a conceptual foundation for future empirical validation with real farmers and agricultural communities, thereby contributing to both agricultural communication research and sustainability-oriented innovation studies.

Materials & Methods

Developing Questions, Elements, and Insights During Early Study Construction

The construction of the study followed the standard Mind Genomics workflow using the BimiLeap platform, which provides a step-by-step interface for building cognitive experiments. The researcher first completed the basic setup steps—defining the study title, specifying the thematic focus, selecting the interaction language, and confirming that no personal information would be collected. Because this project used synthetic respondents, demographic details were neither required nor included. After this short administrative setup, development of the study materials began. Mind Genomics relies on four narrative questions, each accompanied by four answers, producing sixteen short elements that together express the range of ideas the study aims to explore. For many researchers, the most challenging part is crafting the four foundational questions, especially when the topic blends traditional knowledge with modern scientific concepts. Transforming a broad theme such as Vedic–modern farming integration into four concise, meaningful questions often requires multiple rounds of refinement. Once the questions are established, formulating the answers becomes substantially easier. To assist this process, BimiLeap includes the Idea Coach—an AI-driven prompting tool designed to help researchers move from vague concepts to clear, testable statements. In this study, the Idea Coach was used to generate an initial pool of potential questions reflecting how respondents might think about Vedic agricultural principles alongside modern scientific farming. The tool produced fifteen candidate questions, from which the researcher selected and refined the final four. Figure 1 illustrates this progression, from the blank template to the AI-generated suggestions and the finalized set of questions.

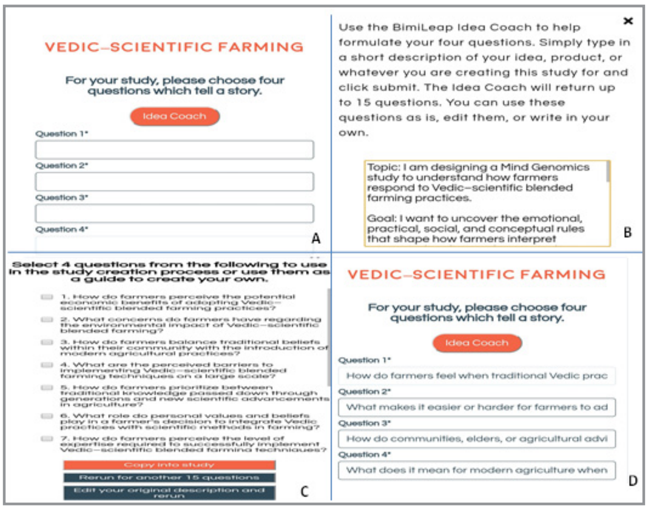

Figure 1: The request for four questions, the Mind Genomics Idea Coach, and the four questions which emerge

The researcher may revise these AI-generated questions to improve clarity, ensure cultural appropriateness, or strengthen the scientific framing. Table 1 presents the complete set of fifteen candidate questions produced by the Idea Coach in the initial pass, prior to any refinement

Table 1: The 15 questions generated by Idea Coach in the first Pass. The 15 questions were generated in response to the paragraph written for Idea Coach in Figure 1, Panel B

S. No	Research Question
1	How do farmers feel when traditional Vedic practices are blended with scientific methods to support farming?
2	What concerns do farmers have about the long-term impact of blended Vedic–scientific farming?
3	How do communities, elders, or agricultural advisors influence a farmer’s decision to try Vedic–scientific blended farming?
4	How do traditional beliefs influence a farmer’s willingness to adopt new scientific tools?
5	What motivates farmers to try a farming method that combines ancient wisdom with modern evidence?
6	How does access to scientific training influence the acceptance of Vedic principles in farming?
7	What makes it easier or harder for farmers to adopt a Vedic–scientific blended farming approach today?
8	How do farmers evaluate the success of Vedic–scientific blended farming on their crops?
9	What role do community success stories play in promoting Vedic–scientific farming?
10	How do farmers balance cultural practices with the practical demands of modern farming?
11	What does it mean for modern agriculture when Vedic principles and scientific methods are combined?
12	How much do farmers trust agricultural advisors when blending Vedic and scientific methods?
13	How does blended Vedic–scientific farming affect a farmer’s confidence in their agricultural decisions?
14	What expectations do farmers have from future innovations that combine Vedic wisdom and modern agriculture?
15	How do farmers perceive risks associated with mixing traditional and scientific farming techniques?

The same approach was used to create the answers. For each question, the Idea Coach generated multiple possible responses within seconds, allowing the researcher to accept, edit, or regenerate these options until sixteen coherent elements were finalized. Each element was reviewed to ensure that it represented one of the intended dimensions of meaning: emotional reactions, practical considerations, social influence, or conceptual interpretations related to Vedic and scientific farming. After finalization, all content was compiled automatically into an Idea Book—a digital record containing the questions, answers, and an AI-generated thematic summary.

Figure 2 shows the answer-generation process, including the blank template, the activation of the Idea Coach, sample outputs, and the finalized set of answers. Table 2 lists the four questions and sixteen elements selected for the experiment.

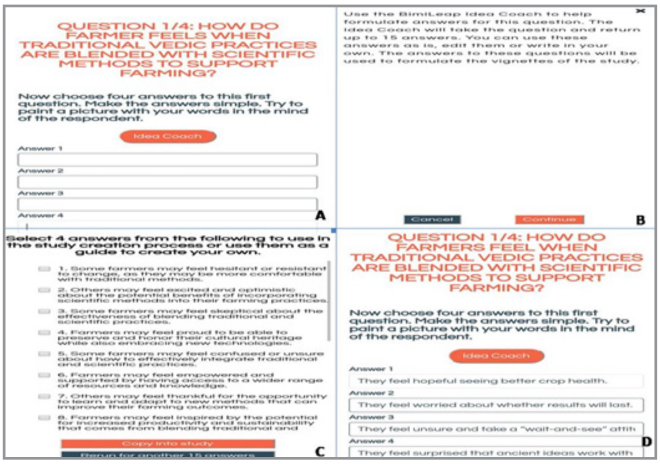

Figure 2: The template showing the request for four answers to the first question (Panel A), the Idea Coach which is either selected to skipped (Panel B), a set of prospective answers to question 1 returned by the Idea Coach (Panel C), and the four selected answers ‘dropped into’ the template

Beyond supporting content generation, the Idea Coach also functions as a valuable instructional tool—essentially acting as a “Socratic assistant” within the study-building process. Even when researchers are not deeply familiar with Vedic agricultural concepts or modern scientific farming methods, the AI provides well-structured, contextually relevant prompts that can be refined, adjusted, or replaced as needed. This ensures that the emerging experimental material remains coherent and meaningful throughout the development stage.

Table 2 presents the four finalized questions and the sixteen elements selected for this study, each lightly edited to enhance clarity and maintain alignment with both traditional Vedic principles and contemporary agricultural thinking.

Table 2: The four questions and the four answers to each question provided by the Idea Coach, viz., AI embedded in the BimiLeap program

Question Code	Question (Silo)	Element ID	Element Description
A	How do farmers feel when traditional Vedic practices are blended with scientific methods to support farming?	A1	They feel hopeful seeing better crop health.
		A2	They feel worried about whether results will last.
		A3	They feel unsure and take a “wait-and-see” attitude.
		A4	They feel surprised that ancient ideas work with modern tools.
B	What makes it easier or harder for farmers to adopt a Vedic–scientific blended farming approach today?	B1	Easier when it improves yield without big expense.
		B2	Harder when equipment and schedules don’t match the method.
		B3	Depends on how simple and clear the instructions are.
		B4	Unexpected weather changes sometimes make the blended method tricky.
C	How do communities, elders, or agricultural advisors influence a farmer’s decision to try Vedic–scientific blended farming?	C1	Elders encourage farmers saying the method is time-tested.
		C2	Advisors sometimes give mixed or confusing guidance.
		C3	Farmers often follow what others in the village are doing.
		C4	A single success demo in the community can shift everyone suddenly.
D	What does it mean for modern agriculture when Vedic principles and scientific methods are combined?	D1	It suggests a more sustainable future for farming.
		D2	It may not mean much if farmers cannot apply it consistently.
		D3	It becomes simply another farming option among many.
		D4	It could redefine how people think about soil, health, and crop life.

In summary, the combination of researcher judgment and AI-assisted prompting enabled a smooth translation of a culturally rooted agricultural theme into a structured Mind Genomics study. This initial construction phase ensured that the final design captured the emotional, practical, social, and conceptual signals that respondents might associate with Vedic–modern farming integration.

Running the Mind Genomics Study

Figure 3 (Panel A) illustrates one of the three classification questions selected for this study. Although Mind Genomics allows up to Sixteen self-profiling options for each classification item, the present study required only simple Yes/No responses because the purpose was not demographic insight but cognitive segmentation. The three classification questions addressed (1) whether the respondent is open to trying new farming methods if they promise better results, (2) whether they trust scientific recommendations more than traditional farming advice, and (3) whether they have ever used Vedic or traditional farming methods in their field work. Since the study used synthetic respondents, no demographic questions such as age, gender, location, or education were included.

Figure 3 (Panel B) shows the brief orientation statement presented to respondents at the start of the experiment. In Mind Genomics, the introduction is deliberately minimal—often a single line—so that respondents form their impressions directly from the elements rather than being primed by a long explanation. In topics requiring specialized background knowledge, longer contextual introductions are sometimes used, but for this exploratory synthetic study a short orientation ensured that each message stood on its own.

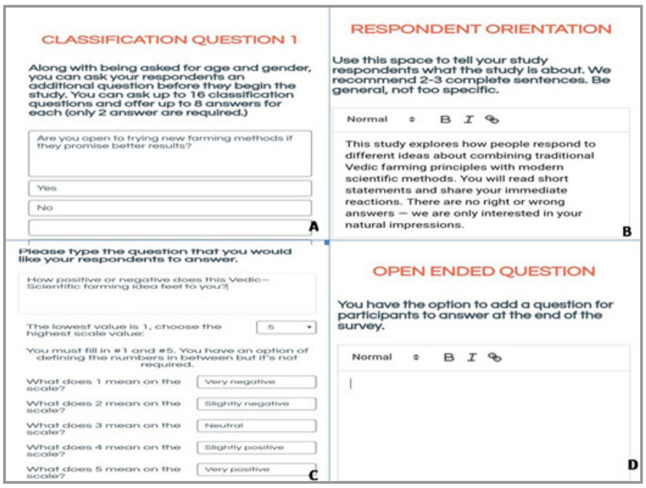

Figure 3: Additional study set-up screens. Panel A: Example of a self-profiling classification question. Panel B: Respondent orientation. Panel C: The rating scale and anchors. Panel D: Openended question.

Figure 3 (Panel C) presents the rating task and the 5-point scale used in this experiment. The scale anchors ranged from 1 = Very negative to 5 = Very positive. Mind Genomics requires the researcher to fix the top and bottom anchors, while intermediate labels may be added optionally. Each vignette was evaluated independently, allowing the regression model to identify which individual messages contributed most strongly to perceived positivity toward the Vedic–Scientific farming idea. Figure 3 (Panel D) depicts the optional open-ended response box, giving respondents the opportunity to include additional thoughts. Although synthetic respondents do not provide meaningful narrative text, the open-ended field remains part of the standard template and appears in all BimiLeap configurations.

Figure 4 contains the last two screens of the setup stage. Figure 4 (Panel A) records the researcher's "final thoughts," including the purpose of the study and the key words associated with it. These notes help maintain clarity, especially when multiple studies on related agricultural themes may exist in the database. In this investigation, the notes emphasized the goal of exploring how respondents interpret the integration of Vedic farming principles with modern scientific agriculture. Key words included terms such as Vedic farming, Modern Agriculture, and Soil Health, enabling easy retrieval and future reference within the BimiLeap system.

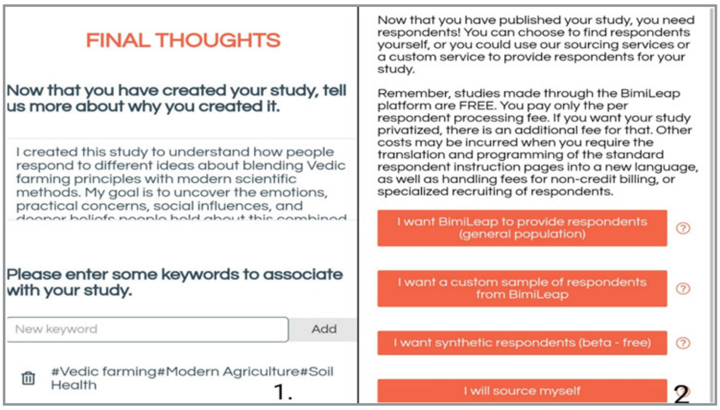

Figure 4: Final thoughts (Panel A), and sourcing the respondents (Panel B).

Figure 4 (Panel B) shows the panel sourcing screen. In human respondent studies, the researcher may choose respondents from various panel providers, either through the default Luc.id API or alternative sources. However, for this project, the researcher selected the synthetic respondent option, which bypasses external panel aggregation and allows the platform to generate statistically diverse artificial respondents. This approach is particularly useful in early-stage conceptual research, where the objective is to uncover potential mindset structures before conducting large-scale studies with real participants. The overall design process demonstrates the simplicity and adaptability of Mind Genomics. Whether the respondents are synthetic or human, the platform allows the researcher to quickly build a structured experimental setup that captures meaningful variation in how people evaluate ideas—in this case, messages linking traditional Vedic farming principles with modern scientific agriculture.

Synthetic Respondent Simulation

Once the study materials were finalized, the Mind Genomics experiment was launched through the standard BimiLeap interface. Unlike conventional human-participant studies requiring recruitment, compensation, and screening, this project used synthetic respondents, eliminating all logistical constraints. The system automatically generated forty-eight synthetic respondents, each programmed to deliver statistically independent patterns of responses. Synthetic respondents do not "think" or "feel," but the platform assigns simulated answers to the three classification questions. These classification values—representing prior exposure to Vedic practices, trust in scientific advice, and openness to new farming methods—serve as segmentation markers analogous to those used in human respondent studies. Figure 5 shows how the test vignettes appeared. Each synthetic respondent evaluated 24 unique combinations of elements, each vignette containing two, three, or four message elements drawn from the final sixteen-element set. Although the vignettes appear random, they follow a strict 4×4 experimental design. Each element appears in exactly five vignettes and is absent in nineteen, ensuring orthogonality and allowing the regression model to isolate the contribution of each Vedic, modern, or blended farming message.

Figure 5: Example of a vignette.

Synthetic respondents assigned a rating to each vignette using the 1–5 affective scale. The platform also generates simulated response-time values in milliseconds. While these timestamps do not represent genuine cognitive processing, they preserve structural equivalence with human datasets and allow future comparative studies. Where human studies require several minutes to complete the twenty-four evaluations, synthetic studies execute almost instantly. This rapid throughput allows the researcher to refine culturally specific topics—such as Vedic agriculture—and verify that the experimental structure is valid before collecting data from real farmers in later phases. Overall, the synthetic respondent simulation replicates the procedural workflow of a Mind Genomics experiment while avoiding the complexities of human testing. The resulting dataset provides a clean, structured foundation for subsequent analysis and for future empirical validation with real agricultural communities.

The Mind Genomics Study on Cognitive Responses to Vedic–Modern Farming Integration

This Mind Genomics study was conducted to explore how people might think about the integration of Vedic agricultural principles with modern scientific farming methods. The purpose of the study was not to evaluate agronomic outcomes, but to uncover the early cognitive patterns, emotional reactions, practical considerations, and conceptual interpretations that individuals—or in this initial phase, synthetic respondent profiles—may attach to the idea of blended Vedic–modern farming. The entire study was constructed on the BimiLeap Mind Genomics platform, following the standard experimental workflow. Because this project represents an early-stage, exploratory phase, synthetic respondents were used instead of human farmers. This approach allowed the researchers to rapidly generate structured response patterns and identify potential micro-mindsets before conducting future field studies with real farmers, particularly in India where Vedic agriculture holds cultural and historical relevance.

The full study setup required approximately 30 minutes, including the creation of four narrative questions and sixteen corresponding message elements. The AI-assisted Idea Coach supported the generation and refinement of these materials, ensuring that each element reflected one of four key dimensions relevant to Vedic–modern farming:

1. Practical benefits or barriers related to adopting Vedic, modern, or blended agricultural methods
2. Scientific or long-term outcomes, such as soil improvement or sustainability
3. Cultural or traditional influences, including guidance from elders and community norms
4. Emotional or intuitive reactions to the concept of blended agricultural practices

Once the elements were finalized, the platform automatically generated 48 synthetic respondents, each assigned to evaluate the 24 vignettes generated by the standard permuted 4×4 experimental design. No external panel recruitment or demographic targeting was needed; the BimiLeap system internally simulated diverse respondent profiles to create variation in ratings.

Table 3 presents the setup information from the study configuration screen, including the study title, the four-question/sixteen-element structure, the 1–5 affective rating scale, and the three classification questions used to capture variation in baseline attitudes toward Vedic farming, scientific trust, and openness to new methods.

This synthetic-respondent study forms the conceptual foundation for later empirical validation with real farmers. By mapping these early cognitive patterns, the research establishes an initial framework for understanding how messages about Vedic–modern blended farming may be communicated more effectively in practical agricultural settings.

Table 3: Study summary provided when the data report is issued at the end of analysis

Study Title	Vedic–Scientific Farming
Identification Number of the Study Date when the study was run Number of respondents Purpose of the study	11272025.Vedic– 27/11/2025 48 synthetic respondents I created this study to understand how people respond to different ideas about blending Vedic farming principles with modern scientific methods. My goal is to uncover the emotions, practical concerns, social influences, and deeper beliefs people hold about this combined farming approach. These insights may help shape better communication, training, and adoption strategies in the future.
Keywords	#Vedic farming#Modern Agriculture#Soil Health
Study info	This study explores how people respond to different ideas about combining traditional Vedic farming principles with modern scientific methods. You will read short statements and share your immediate reactions. There are no right or wrong answers — we are only interested in your natural impressions.
Preliminary question 1	Are you open to trying new farming methods if they promise better results? 1=Yes 2=No

Preliminary question 2	Do you trust scientific recommendations more than traditional farming advice? 1=Yes 2=No
Preliminary question 3	Have you ever used any Vedic or traditional farming methods in your field work? 1=Yes 2=No
Rating question	How positive or negative does this Vedic–Scientific farming idea feel to you? 1=Very negative 2=Slightly negative 3=Neutral 4=Slightly positive 5=Very positive

Analyzing the Data: Transforming Ratings and Applying OLS(Ordinary Least-Squares) Regression

The study generated data from 48 synthetic respondent profiles, each evaluating 24 unique vignettes, producing a total of 1,152 vignette evaluations (48 × 24). As in all Mind Genomics experiments, nearly every vignette was unique because the platform systematically arranged the sixteen elements into twenty-four combinations using the standard 4×4 experimental design. Respondents—whether human or synthetic—evaluate complete vignettes rather than single statements, which means traditional approaches such as averaging raw ratings for individual elements are not meaningful. Instead, Mind Genomics quantifies the contribution of each element independently, treating these short statements as the basic units of interpretation. In typical human-based Mind Genomics studies, each of the sixteen elements appears exactly five times per respondent. In the synthetic-respondent mode used here, the system is not required to enforce a strict five-appearance pattern. Rather, the platform distributes elements across the 24 vignettes based on the internal rules of the 4×4 design, ensuring orthogonality and enough variation for stable estimation of regression coefficients. This structure provides sufficient coverage to identify the independent effects of messages related to Vedic farming principles, modern agricultural practices, emotional reactions, practical barriers, social influences, and conceptual interpretations of blended farming approaches. Before regression can be applied, the 5-point rating scale must be transformed to produce interpretable insights that reflect how positively or negatively respondents evaluated each vignette.

Step 1 — Transforming the Ratings into a Binary Scale

The study used a 5-point scale ranging from very negative to very positive to capture respondents' immediate emotional reaction to the Vedic–Scientific farming idea:

1 = Very negative
2 = Slightly negative
3 = Neutral
4 = Slightly positive
5 = Very positive

To simplify analysis and make the results comparable across elements and mind-sets, these ratings were converted into a binary variable representing whether the message produced a clearly positive reaction. The transformation used was:

Ratings 4 and 5 → 100 ("Positive")
Ratings 1, 2, and 3 → 0 ("Not Positive")

Here, ratings 1 and 2 explicitly represent negative responses, and rating 3 is neutral, so all three naturally fall into the "Not Positive" category.

This binary conversion makes it easier to interpret which elements consistently push respondents toward a positive perception of Vedic–Scientific farming. A small random number (less than 10^{-5}) was automatically added by the platform to prevent regression instability, which can occur in synthetic datasets. In this experiment, "Positive" indicates that respondents perceived the blended Vedic–Scientific farming idea favorably. No additional binary variable (e.g., personal relevance) was created because synthetic respondents cannot generate meaningful self-relevance patterns.

Step 2 — Estimating the Regression Equation

After transforming the 5-point positive–negative rating scale into a binary variable, Ordinary Least-Squares (OLS) regression was applied to estimate the contribution of each of the sixteen elements. The Mind Genomics model used in this study follows the form:

$$DV = k_1(A1) + k_2(A2) + ... + k_{16}(D4)$$

No additive constant was included, allowing all coefficients to be directly comparable within the study and across other Mind Genomics experiments. Each coefficient represents the percentage of positive responses (ratings 4 or 5) attributable to the presence of that element in a vignette. For example, a coefficient of 23 indicates that 23% of evaluations were positive when that element appeared.

The 4×4 experimental design supports regression modeling at multiple levels, including the total panel, subgroups defined by the classification questions, and individual respondents. This structure provides the basis for identifying distinct cognitive patterns and the emergent mind-sets described later.

Figure 6 presents the coefficients for the Total Panel, as displayed in real time on the BimiLeap dashboard. In the present study, most coefficients were positive, indicating generally favorable reactions toward the integration of Vedic agricultural principles with modern scientific farming methods. Consistent with standard Mind Genomics interpretation, coefficients of 15 or higher were treated as meaningfully strong signals.

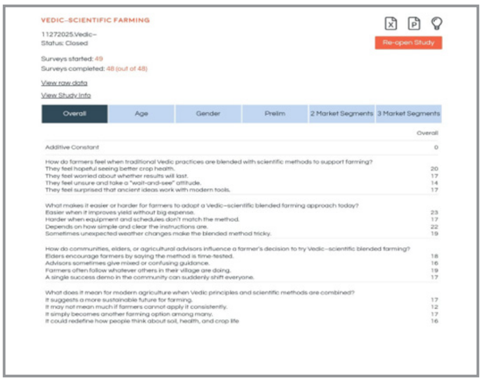

Figure 6: Screenshot of the visual report of the data. The visual report is updated when the researcher refreshes the screen. The screen shows the number of respondents who started the study, the number who completed, the elements and the coefficients estimated for the Total Panel.

The strongest-performing elements for the Total Panel included:
A1 – "They feel hopeful seeing better crop health."
(Coefficient: 20)
B1 – "Easier when it improves yield without big expense."
(Coefficient: 23)
B3 – "Depends on how simple and clear the instructions are."
(Coefficient: 22)
C3 – "Farmers often follow whatever others in their village are doing."
(Coefficient: 19)
C1 – "Elders encourage farmers by saying the method is time-tested."
(Coefficient: 18)
D4 – "It could redefine how people think about soil, health, and crop life."
(Coefficient: 16)

These elements provided the initial structure for differentiating the three emergent mind-sets uncovered in the study

Step 3 — Create the Models for the Total Panel and for the Self-Defined Groups

After the binary transformation was completed, Ordinary Least-Squares (OLS) regression was applied to generate statistical models for both the Total Panel and the self-defined subgroups created from the study's classification questions. Each synthetic respondent evaluated 24 unique vignettes, producing a total of 1,152 vignette evaluations (48 × 24). This volume of data provided adequate variation for stable estimation of the coefficients. Although traditional human-based Mind Genomics studies ensure that each of the sixteen elements appears exactly five times per respondent, the synthetic mode does not require such strict repetition. Instead, the BimiLeap platform distributes elements across the 24 vignettes according to the standard 4×4 design, preserving orthogonality and enabling accurate estimation of each element's independent effect on perceived positivity toward Vedic–scientific farming. The Total Panel model summarizes the overall cognitive response of the 48 synthetic profiles. Table 4 displays the coefficients for all sixteen elements, where values of +16 or higher signify meaningfully strong positive signals and coefficients of +25 or above represent particularly influential messages. These values offer a clear numerical interpretation of which Vedic–modern agricultural messages resonated most strongly with the simulated respondent pool. To provide a comprehensive view of the regression results, Table 4 presents the element-level coefficients for the Total Panel and subgroup solutions, forming the quantitative foundation for the subsequent mind-set analysis.

Table 4: Element-level coefficients for the Total Panel, self-defined subgroups, and the two- and three-cluster solutions. All sixteen elements are shown; coefficients represent percentage of positive responses (binary-transformed ratings). Elements with coefficients of +25 or higher are highlighted

How do farmers feel when traditional Vedic practices are blended with scientific methods?							
Element ID	**Element Description**	**Total**	**M1 of 2**	**M2 of 2**	**M1 of 3**	**M2 of 3**	**M3 of 3**
A1	They feel hopeful seeing better crop health	20	16	26	17	27	17
A2	They feel worried about whether results will last	17	15	19	20	17	11
A3	They feel unsure and take a "wait-and-see" attitude	14	10	22	14	21	10
A4	They feel surprised that ancient ideas work with modern tools	17	14	21	17	19	16
What makes it easier or harder for farmers to adopt a Vedic–scientific blended farming approach?							
Element ID	**Element Description**	**Total**	**M1 of 2**	**M2 of 2**	**M1 of 3**	**M2 of 3**	**M3 of 3**
B1	Easier when it improves yield without big expense	23	23	22	24	22	23

B2	Harder when equipment and schedules don't match the method	17	21	11	23	9	15
B3	Depends on how simple and clear the instructions are	22	23	21	27	21	20
B4	Sometimes unexpected weather changes make the blended method tricky	19	20	19	21	18	21
How do communities, elders, or advisors influence farmers' decisions to try Vedic–scientific farming?							
Element ID	**Element Description**	**Total**	**M1 of 2**	**M2 of 2**	**M1 of 3**	**M2 of 3**	**M3 of 3**
C1	Elders encourage farmers by saying the method is time-tested	18	14	23	13	17	25
C2	Advisors sometimes give mixed or confusing guidance	16	16	15	17	6	21
C3	Farmers often follow whatever others in their village are doing	19	16	23	17	20	22
C4	A single success demo in the community can suddenly shift everyone	17	13	21	13	14	24
What does it mean for modern agriculture when Vedic principles and scientific methods are combined?							
Element ID	**Element Description**	**Total**	**M1 of 2**	**M2 of 2**	**M1 of 3**	**M2 of 3**	**M3 of 3**
D1	It suggests a more sustainable future for farming	17	11	26	10	28	17
D2	It may not mean much if farmers cannot apply it consistently	12	10	15	13	15	9
D3	It simply becomes another farming option among many	17	15	23	14	22	18
D4	It could redefine how people think about soil, health, and crop life	16	14	20	11	20	20

The same regression procedure was then applied to the subgroups generated from the three classification questions: (1) whether the respondent was open to trying new farming methods, (2) whether they trusted scientific recommendations more than traditional advice, and (3) whether they had previously used Vedic or traditional farming methods. Because each question offered a simple Yes/No option, multiple structural subgroups emerged from the combinations of these responses. Only groups comprising at least ten synthetic respondents were retained for analysis to ensure stability of the resulting coefficients. Although synthetic respondents do not possess real beliefs or experiential differences, these subgroup models functioned as intermediate analytical tools, demonstrating that systematic variation existed in the dataset and validating the transition toward deeper structural interpretation.

Visual review of the subgroup and Total Panel coefficients revealed that some patterns were shared across groups, whereas others differentiated respondents more clearly. However, because regression tables alone do not always capture complex interpretive structure, Mind Genomics standard practice is to proceed from these numeric models to mind-set discovery. By clustering respondents based on similarity in their 16-element coefficient patterns, the analysis identifies coherent cognitive groups that reveal how different types of individuals interpret the same agricultural messages. Thus, the regression models developed in this step provided the essential statistical foundation for discovering the three emergent mind-sets identified in this study.

Results

Mind Sets

Mind-set discovery was based on clustering the 48 synthetic respondents using their individual 16-element coefficient vectors, allowing the cognitive structure to emerge directly from patterns of element-level impacts. Three distinct mind-sets were identified, each representing a different way respondents interpreted the integration of Vedic agricultural principles with modern scientific farming. During the clustering process, two subgroup solutions were generated: a 2-cluster solution (M1-of-2 and M2-of-2) and a 3-cluster solution (M1-of-3, M2-of-3, and M3-of-3). Following standard Mind Genomics analytic practice, the 3-cluster solution was selected because it produced clearer internal coherence, stronger interpretability, and conceptually meaningful distinctions across respondents. Accordingly, M1-of-3, M2-of-3, and M3-of-3 were adopted as Mind-Set 1 (Practical & Clarity-Focused), Mind-Set 2 (Future-Optimistic & Science-Aligned), and Mind-Set 3 (Tradition-Oriented & Socially Influenced) in the final analysis. Table 5 presents the element-level coefficients for the three mind-sets, showing how each group differs in its cognitive reactions to the 16 messages. These coefficients form the empirical foundation for interpreting the three distinct cognitive segments.

Mind-Set 1: Practical & Clarity-Focused Respondents

Respondents in this mind-set assigned their strongest coefficients to messages emphasizing simplicity, clarity, and ease of implementation. Elements such as "Depends on how simple and clear the instructions are" (B3), "Easier when it improves yield without big expense" (B1), and practical constraints such as mismatched schedules or equipment (B2) were particularly influential. Weather-related unpredictability (B4) also elicited strong responses, reinforcing that this group evaluates blended farming primarily through real-world feasibility. Philosophical or conceptual messages had weaker effects. For this segment, adoption depends on whether the method is practical, low-risk, and straightforward to follow.

Mind-Set 2: Future-Optimistic & Science-Aligned Respondents

This mind-set responded most strongly to elements framed around scientific benefits, sustainability, and future improvement. High-performing elements included “It suggests a more sustainable future for farming” (D1), “They feel hopeful seeing better crop health” (A1), and messages portraying the blended method as a legitimate option among many (D3). Even elements expressing cautious evaluation (A3) resonated with this group, suggesting they remain thoughtful but open to innovation. Overall, these respondents interpret the Vedic–scientific blend as a progressive, evidence-aligned approach with long-term potential for soil health and crop vitality.

Mind-Set 3: Tradition-Oriented & Socially Influenced Respondents

This group was most strongly influenced by messages grounded in tradition and social endorsement. Elements such as “Elders encourage farmers saying the method is time-tested” (C1) and “A single success demo in the community can shift everyone suddenly” (C4) produced the highest coefficients. Community alignment (C3) and localized examples of success were also motivational. For this mind-set, farming decisions are shaped largely by cultural continuity, peer behavior, and visible social proof. Scientific or practical framing alone has limited persuasive power unless reinforced through community uptake or trusted social figures. Table 5 summarizes the elements with relatively high coefficients within each mind-set of the three-cluster solution, illustrating the numerical basis for the mind-set interpretations described above.

Table 5: Elements with relatively high coefficients within each mind-set from the three-cluster solution

Group(Binary Ratings)					
Element ID	**Element Description**	**Total**	**M1**	**M2**	**M3**
B3	Depends on how simple and clear the instructions are	22	27	21	20
B1	Easier when it improves yield without big expense	23	24	22	23
B2	Harder when equipment and schedules don’t match the method	17	23	9	15
B4	Sometimes unexpected weather changes make the blended method tricky	19	21	18	21
Strong for Mind-Set 2- Future-Optimistic & Science-Aligned Respondents					
Element ID	**Element Description**	**Total**	**M1**	**M2**	**M3**
D1	It suggests a more sustainable future for farming	17	10	28	17
A1	They feel hopeful seeing better crop health	20	17	27	17
B1	Easier when it improves yield without big expense	23	24	22	23
D3	It simply becomes another farming option among many	17	14	22	18
A3	They feel unsure and take a “wait-and-see” attitude	14	14	21	10
B3	Depends on how simple and clear the instructions are	22	27	21	20
Strong for Mind-Set 3- Tradition-Oriented & Socially Influenced					
Element ID	**Element Description**	**Total**	**M1**	**M2**	**M3**
C1	Elders encourage farmers by saying the method is time-tested	18	13	17	25
C4	A single success demo in the community can suddenly shift everyone	17	13	14	24

Interpretive Overview

Despite relying on synthetic respondents in this exploratory phase, the analysis revealed clear and structured differences across mind-sets. Mind-Set 1 prioritizes practicality and clarity, Mind-Set 2 is motivated by scientific framing and future-oriented benefits, and Mind-Set 3 responds most strongly to tradition and community influence. Table 5 illustrates how the 16 elements performed across the total sample and each of the three emergent groups. These distinctions underscore that respondents do not interpret blended Vedic–scientific farming as a single coherent narrative. Instead, they selectively prioritize elements that align with their cognitive orientation—whether grounded in feasibility, scientific reasoning, or social tradition. This structured variation provides a foundation for developing communication strategies, extension programs, and future empirical studies tailored to different agricultural mind-sets.

Moving Toward Actionable Communication: The Role of the Personal Viewpoint Identifier (PVI)

The broader purpose of Mind Genomics extends beyond identifying mind-sets; it aims to convert these cognitive insights into tools that can guide real-world communication and decision-making. Rooted in the tradition of consumer decision science established by Paul Green and Yoram Wind, Mind Genomics blends scientific rigor with practical usability. One of its most important applications is the Personal Viewpoint Identifier (PVI)—a brief classification tool that assigns new individuals to a specific mind-set so that communication can be tailored to their way of thinking. In the context of agriculture, extension workers, policymakers, and input advisors often assume that all farmers interpret messages about new methods—whether traditional, modern, or blended—in a similar way. However, the present study shows that people respond quite differently to the same information about Vedic–scientific farming. Some prioritize practical clarity, others are motivated by scientific or future-oriented benefits, and still others rely heavily on tradition and community endorsement. Recognizing these differences allows agricultural communicators to refine their approach—emphasizing clarity for one group, scientific framing for another, or trusted social proof for a third. Despite the usefulness of such a tool, a PVI could not be developed in the current project. Because the experiment used synthetic respondents rather than real farmers, the data do not capture authentic demographic variation, emotional nuance, or meaningful self-profiling patterns. A functioning PVI requires real individual differences that can be used to identify discriminating questions—something synthetic data cannot provide.

Thus, in this exploratory phase, the role of a PVI remains conceptual. The study demonstrates that: the three mind-sets are stable and interpretable, the element-level differences are meaningful, and more effective agricultural communication would be possible if individuals could be quickly classified.

In future research conducted with real Indian farmers or diverse international agricultural communities, a PVI could be created by selecting a small set of discriminating questions derived from the mind-set patterns observed here. Such a tool would assign new respondents to Mind-Set 1 (Practical & Clarity-Focused), Mind-Set 2 (Future-Optimistic & Science-Aligned), or Mind-Set 3 (Tradition-Oriented & Socially Influenced), providing communication tailored to each group's cognitive and motivational patterns. If constructed, the PVI would follow the standard PVI360 structure. The researcher would upload the coefficient matrix or discriminating responses into the template, and the system would generate a short screening tool with 4–6 questions. Based on an individual's answers, the tool would classify them into the most likely mind-set and provide guidance aligned with their thinking—whether emphasizing ease of implementation, scientific benefits, or community reinforcement. While a functioning PVI cannot be produced using synthetic respondents, this study establishes a strong conceptual foundation for its development. A future PVI designed for Vedic–scientific agricultural communication could offer extension workers, policymakers, and sustainability practitioners a rapid, evidence-based method for understanding "how this farmer thinks," enabling communication that is more impactful, culturally grounded, and strategically precise.

Discussion

This exploratory Mind Genomics study set out to examine how people cognitively interpret messages that blend Vedic agricultural principles with modern scientific farming. Although the present phase used synthetic respondents rather than real farmers, the resulting cognitive patterns were structured, interpretable, and aligned with established agricultural adoption theories. Three distinct mind-sets emerged—each reflecting a different way of processing emotional, practical, social, and conceptual aspects of Vedic–scientific blended farming. These mind-sets not only validate the analytical framework but also illustrate how varied cognitive orientations shape agricultural decision-making.

Mind-Set 1: Practical & Clarity-Focused Respondents

Individuals in this group responded most strongly to messages related to ease of implementation, clarity of instructions, and practical feasibility. Elements emphasizing simple guidelines (B3), affordable benefits (B1), and manageable constraints (B2, B4) were particularly influential. This cognitive pattern aligns closely with classical adoption research showing that farmers adopt innovations when they perceive them as low-risk, easy to understand, and compatible with existing practices (Feder et al., 1985). Rogers' Diffusion of Innovations theory likewise highlights complexity and compatibility as central determinants of adoption [5].

Thus, Mind-Set 1 reflects a practical, implementation-oriented orientation: these respondents are not opposed to Vedic–scientific integration, but their acceptance is conditional upon clarity, reduced complexity, and operational realism.

Mind-Set 2: Future-Optimistic & Science-Aligned Respondents

Mind-Set 2 rated highest the elements describing sustainability, scientific legitimacy, and future potential. Messages such as "a more sustainable future for farming" (D1), "hopeful crop health improvements" (A1), and conceptual legitimacy (D3) were influential. This pattern resonates strongly with research showing that farmers adopt new practices when they expect long-term benefits, ecological resilience, and scientific credibility [12]. Likewise, studies from global adoption literature demonstrate that positive attitudes toward innovation and knowledge-based evaluation strongly predict uptake [8].

This mind-set represents a forward-looking segment that gravitates toward innovation, evidence-based reasoning, and long-term value—suggesting that modern-scientific framing may be especially effective for motivating this group.

Mind-Set 3: Tradition-Oriented & Socially Influenced Respondents

The third mind-set responded most strongly to messages grounded in tradition, community validation, and collective practice. Elements such as elder endorsement (C1), success demonstrations (C4), and village-level behavioral cues (C3) shaped their cognitive reactions. This mindset reflects well-established findings that agricultural adoption in India is heavily shaped by social networks, peer influence, and trusted community intermediaries [9]. Social Learning theory further reinforces that individuals adopt behaviors modeled by respected or relatable figures [7].

Thus, Mind-Set 3 is culturally rooted and socially responsive: change is most likely when trusted figures endorse it, or when visible community success normalizes the practice.

These differentiated cognitive orientations align with broader scholarly efforts to map farmers' mental models in agricultural decision-making contexts. Recent systematic syntheses have emphasized the value of understanding cognitive structures to inform policy and communication strategies [13]. While such reviews consolidate existing cognitive mapping research, the present study extends this line of inquiry by experimentally segmenting interpretive patterns using a Mind Genomics framework.

Taken together, these findings show that blended Vedic–scientific farming is not interpreted uniformly. Instead, respondents prioritize different aspects of the narrative depending on their cognitive style:

Mind-Set 1 → practical clarity and operational feasibility

Mind-Set 2 → scientific validation and future promise

Mind-Set 3 → tradition, social proof, and cultural continuity

These differences reinforce the study's original objective: to reveal how emotional, practical, social, and conceptual elements influence early interpretations of Vedic–modern integration. Even with synthetic respondents, the patterns were stable and theoretically grounded suggesting that real farmers may also cluster into similar cognitive groups. Table 5 further demonstrates how each mind-set responds to specific message elements, highlighting clear segmentation within the total sample. This segmentation provides a strategic communication pathway for future field studies: Messages for Mind-Set 1 should emphasize clarity, low cost, and step-by-step practicality. Messages for Mind-Set 2 should highlight scientific legitimacy, sustainability, and long-term outcomes. Messages for Mind-Set 3 should leverage demonstrations, elder endorsement, and culturally resonant framing. Although Mind Genomics typically progresses toward constructing a Personal Viewpoint Identifier (PVI), a valid PVI could not be created here because synthetic respondents do not provide genuine psychological variation. Since PVI algorithms require real human differences in attitudes and self-profiling responses, the current phase treats the PVI as conceptual only. A functional PVI can be developed in future research when real farmers are included. Overall, the study lays a conceptual foundation for future empirical work involving real farmers, setting the stage for more accurate mapping of agricultural cognition and improved communication strategies for blended Vedic–scientific farming systems

Conclusion

This exploratory Mind Genomics study extends prior work by mapping how people cognitively interpret the integration of Vedic agricultural principles with modern scientific farming. Using synthetic respondents, the study identified three coherent mindsets—Practical & Clarity-Focused, Future-Optimistic & Science-Aligned, and Tradition-Oriented & Socially Influenced—each reflecting a distinct way individuals evaluate blended farming messages.

The results show that people do not perceive Vedic–scientific agriculture as a single unified idea. Instead, they respond to different components of the narrative depending on whether they prioritize feasibility, scientific promise, or social and cultural reinforcement. These distinctions directly support the study's objectives by revealing which message elements create motivation, how interpretations diverge across mind-sets, and why targeted communication may be necessary for effective agricultural outreach [14].

Although synthetic respondents were used in this preliminary phase, the cognitive patterns uncovered here establish a strong foundation for future field studies with real farmers. Such studies can validate the mind-sets, refine message strategies, and eventually support the development of a Personal Viewpoint Identifier (PVI) for practical use in agricultural extension.
Overall, the findings suggest that integrating Vedic and scientific farming principles has meaningful communicative potential—but its success will depend on understanding "how different farmers think." This study provides the conceptual groundwork for doing so and paves the way for more culturally grounded, psychologically informed, and scientifically aligned agricultural communication.

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Ethical Statement

This study did not involve human participants, animals, or sensitive personal data. All analyses were conducted using synthetic respondent simulations generated through the BimiLeap platform. Therefore, institutional ethical approval and informed consent were not required. The authors confirm that the research complies with relevant ethical standards and publication guidelines.

Conflict of Interest

The authors declare no conflict of interest.

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