

Week-06-L-06

# Value Engineering Agricultural Plan

## Value Engineering Case Study

### Case 2: Irrigation Strategies

#### Presentation & Course Summary

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# Evaluation Criteria of Alternatives

- A - Constructability
- B - Ease of Maintenance
- C - Durability
- D - Continuity of supply
- E - Cost

	B	C	D	E	T. Wt	Adj. Wt	% Wt
A	<u>A2</u> <sup>1</sup>	A1 <sup>2</sup>	<u>D1</u> <sup>3</sup>	<u>E2</u> <sup>4</sup>	3 <sup>5 ↓</sup>	<u>4</u> <sup>6 (5+1)</sup>	<u>18.18</u> <sup>7</sup>
B		<u>C1</u>	<u>D2</u>	E3	0	1	4.54
		C	<u>D2</u>	<u>E2</u>	1	2	9.09
			D	<u>E1</u>	5	6	27.27
				E	8	9	40.91
					<b>Total</b>	<u>22</u>	<b>100</b>

4/22 × 100

Evaluation Weight Factor (Difference in Importance)	
1	Minor Difference
2	Medium Difference
3	Major Difference

# Value alternative scoring

- Columns 4, 5, and 6 show average scores given by irrigation experts.
- Panel rated alternatives on a 1 to 5 scale for each criterion.
- A score of 1 implies least significance, while 5 indicates the highest.

Table 1: Weight of evaluation criteria & value alternatives score

- Excellent = 5 point
- Very Good = 4 point
- Good = 3 point
- Fair = 2 point
- Poor = 1 point

	<b>Evaluation Criteria</b>	<b>Weight</b>	<b>VA-I</b>	<b>VA-II</b>	<b>VA-III</b>
A	Constructability	0.1818	3 $(3 \times 0.1818 = 0.5454)$	4	1
B	Ease of Maintenance	0.0454	3 $(3 \times 0.0454 = 0.1362)$	5	3
C	Durability	0.0909	4 $(4 \times 0.0909 = 0.3636)$	5	3
D	Continuity of supply	0.2727	2	2	3
E	Cost	0.4091	3	4	2
			15	20	12

# Scores of value alternative

- The alternatives' scores in columns 4, 5, 6 is calculated by multiplying by the evaluation criteria weights with value alternative scores from Table 1.

Table 2: Scores of value alternative

	<b>Evaluation Criteria</b>	<b>Weight</b>	<b>VA-I</b>	<b>VA-II</b>	<b>VA-III</b>
A	Constructability	0.1818	0.5454	0.7272	0.1818
B	Ease of Maintenance	0.0454	0.1362	0.227	0.1362
C	Durability	0.0909	0.3636	0.4545	0.2727
D	Continuity of supply	0.2727	0.5454	0.5454	0.1818
E	Cost	0.4091	1.2273	1.6364	0.8182
	Total value	1.0000	2.8179	3.5905	1.5907
	Rank		II	I	III

Rank Rank Rank

- Based on the evaluation criteria, the findings suggest that VA-II has the greatest total score.

# Case Study of Value Alternatives

## **VA-1: Drip Irrigation with Rainwater Harvesting and Water Reuse:**

### **Case Study: Small-Scale Farming in a Semi-Arid Region**

- Small-scale farmers in a semi-arid region optimize water use through drip irrigation, rainwater harvesting, and treated wastewater reuse.
- Drip irrigation ensures precise watering, conserving water. Rainwater harvesting supplements water supply during the short rainy season.
- Repurposing treated wastewater reduces dependence on local freshwater sources, fostering sustainable agriculture in challenging environments.



# Case Study of Value Alternatives

## ***VA-II: Pond Irrigation with Crop Rotation and Selection:***

### Case Study: Rice Farming in Southeast Asia

- In Southeast Asia, rice farmers address water and soil challenges.
- They construct ponds for water storage, practicing crop rotation and choosing drought-resistant rice.
- This optimizes water use, enhances soil fertility, boosts rice yields, and eases strain on local water resources, as seen in sustainable farming in the Mekong Delta, Vietnam.



# Case Study of Value Alternatives

## VA-III: Construct Canals (for better water distribution) with Drip Irrigation:

### Case Study: Large-Scale Farming Cooperative in an Arid Region

- In a water-scarce area, a farming cooperative established canals for efficient water distribution from a central source to fields.
- Drip irrigation systems in each field deliver water directly to plants, reducing wastage.
- This approach ensures sustainable crop cultivation on a larger scale.





# Summarising the course:

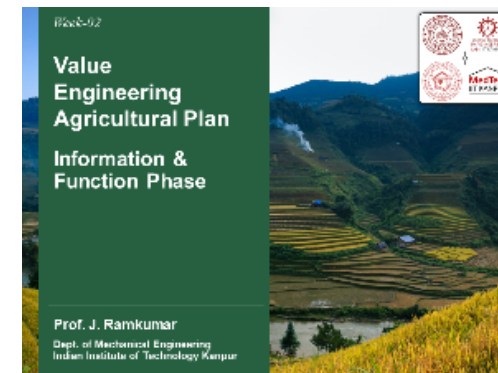
## ✓ Week 1:

- ✓ Background
- ✓ Definition & basic terms
- ✓ Type of Values
- ✓ Why to use VE?
- ✓ Cost Reduction vs. VE

## ✓ Week 2:

*Information Phase*

- ✓ Forming VE Team
- ✓ Job Plan *BoM*
- ✓ Function Definition
- ✓ Function Analysis
- ✓ Cost Analysis







# Summarising the course:

## Week 3:

- ✓ FAST, ✓ *Work (wb) Sell*
- ✓ Numerical Evaluation of functions
- ✓ FCM and VIP Index
- ✓ Life Cycle Costing

## Week 4:

- ✓ Innovation & Thinking
- ✓ Idea Generation & Creative Thinking
- ✓ Brainstorming
- ✓ Feature Analysis



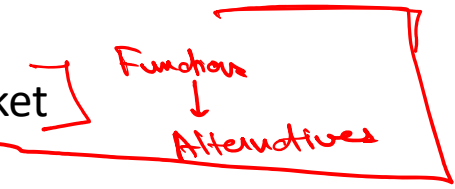
# Summarising the course:

## Week 5:

- ✓ Sustainable Concepts
- ✓ Life Cycle Analysis
- ✓ Presentation and Report
- ✓ Project Facilitation & Oversight

## Week 6:

- ✓ Case Study I:
  - Harvest Basket
- ✓ Case Study II:
  - Irrigation Strategies



Thank You

