*Week-06-L-02*

# Value Engineering Agricultural Plan

## Value Engineering Case Study

## Case 1: Harvest Basket

### Function & Creativity Phase

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# *Function Phase*

- Harvest baskets play a crucial role in farming, and they serve several important functions for farmers during the harvesting process.
- These functions are designed to make the harvesting of crops, fruits, and vegetables more efficient and effective.

| S. No. | Part Name | Function Definition | | Function Location | | | |
|---|---|---|---|---|---|---|---|
| | | *Verb* | *Noun* | *Part* | | *Assembly* | |
| | | | | *P* | *S* | *P* | *S* |
| 1. | Body | Hold | Items | ✓ | | ✓ | |
| | | Store | Items | | ✓ | | ✓ |
| | | Provide | Stability | | ✓ | | ✓ |
| 2. | Straps | Support | Load | ✓ | | | ✓ |
| | | Facilitate | Mobility | | ✓ | | ✓ |
| | | Distribute | Load | | ✓ | | ✓ |
| 3. | Base | Provide | Stability | ✓ | | | ✓ |
| | | Hold | Items | | ✓ | | ✓ |
| | | Support | Load | | ✓ | | ✓ |
| 4. | Frame | Provide | Support | ✓ | | | ✓ |

→ Primary Function of H.B.

Primary – P
Secondary – S

# *Numerical Evaluation of Functions*

| | B | C | D | T. Wt | Adj.wt | % Wt |
|---|---|---|---|---|---|---|
| A | A2 | A3 | A2 | 7 | 8 | 50 |
| B | | B3 | D1 | 3 | 4 | 25 |
| C | | | D1 | 0 | 1 | 6.25 |
| D | | | | 2 | 3 | 18.75 |
| | | | | | 16 | |

8/16 ×100 = 50%

| Key Letters | Functions |
|---|---|
| A | Hold Items |
| B | Support Load |
| C | Provide Stability |
| D | Provide Support |

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

# *Numerical Evaluation of Functions*

| | B | C | D | T. Wt | Adj.wt | % Wt |
|---|---|---|---|---|---|---|
| A | A2 | A3 | A2 | 7 | 8 | 50.00 |
| | B | B3 | D1 | 3 | 4 | 25.00 |
| | | C | D1 | 0 | 1 | 6.25 |
| | | | D | 2 | 3 | 18.75 |
| | | | | | 16 | 100 |

| **Key Letters** | **Functions** |
|---|---|
| A | Hold Items |
| B | Support Load |
| C | Provide Stability |
| D | Provide Support |

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

# *Function Cost Matrix and VIP Index*

| S. No. | Part Name | Cost | Hold Items | Support Load | Provide Stability | Provide Support |
|---|---|---|---|---|---|---|
| | | | A | B | C | D |
| 1. | Body | 600 | 500 | | 100 | |
| 2. | Straps | 250 | | 250 | | |
| 3. | Base | 150 | 25 | 25 | 100 | |
| 4. | Frame | 100 | | | | 100 |
| | **Total** | **1100** | **525** | **275** | **200** | **100** |
| | | | | | | |
| | | | | | | |
| | | | | | | |

# *Function Cost Matrix and VIP Index*

| S. No. | Part Name | Cost | Hold Items | Support Load | Provide Stability | Provide Support |
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| 1. | Body | 600 | 500 | | 100 | |
| 2. | Straps | 250 | | 250 | | |
| 3. | Base | 150 | 25 | 25 | 100 | |
| 4. | Frame | 100 | | | | 100 |
| | **Total** | **1100** | **525** | **275** | **200** | **100** |
| | **%Cost** | | **47.73** | **25** | **18.18** | **9.09** |
| | | | | | | |
| | | | | | | |

$100/1100 \times 100\ \% = 9.09$

# *Function Cost Matrix and VIP Index*

| S. No. | Part Name | Cost | Hold Items | Support Load | Provide Stability | Provide Support |
|---|---|---|---|---|---|---|
| | | | A | B | C | D |
| 1. | Body | 600 | 500 | | 100 | |
| 2. | Straps | 250 | | 250 | | |
| 3. | Base | 150 | 25 | 25 | 100 | |
| 4. | Frame | 100 | | | | 100 |
| | **Total** | **1100** | **525** | **275** | **200** | **100** |
| | **%Cost** | | **47.73** | **25** | **18.18** | **9.09** |
| | **% Weight** | | **50.00** | **25.00** | **6.25** | **18.75** |
| | | | | | | |

# *Function Cost Matrix and VIP Index*

| S. No. | Part Name | Cost | Hold Items | Support Load | Provide Stability | Provide Support |
|---|---|---|---|---|---|---|
| | | | A | B | C | D |
| 1. | Body | 600 | 500 | | 100 | |
| 2. | Straps | 250 | | 250 | | |
| 3. | Base | 150 | 25 | 25 | 100 | |
| 4. | Frame | 100 | | | | 100 |
| | **Total** | **1100** | **525** | **275** | **200** | **100** |
| Row 7 | %Cost | | 47.73 | 25 | 18.18 | 9.09 |
| Row 8 | % Weight | | 50.00 | 25.00 | 6.25 | 18.75 |
| | **VIP Index** | | **0.95** | **1.00** | **2.91** | **0.48** |

(100/1100)*100
= 9.09%

$$VIP\ Index = \frac{\%\ Cost}{\%\ Weight}$$

# *Creativity Phase*

Creative Alternatives for Bamboo Harvest Basket:

- **Modular Compartments:** Design a customizable basket with modular compartments for different crops or farmer preferences.
- **Foldable Baskets:** Create baskets that can be folded or collapsed, enhancing storage and transport convenience.
- **Double Straps:** Improve comfort, efficiency, and safety with harvest baskets featuring double straps.
- **Cushions:** Enhance farmer comfort and protect produce with baskets equipped with cushions.
- **Bamboo Treatments:** Experiment with bamboo treatments like heat treatment, preservatives, or coatings to enhance durability.

# Thank You


ideas to products
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IIT KANPUR