

Decision Making in Agriculture

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Why Bother Making Decisions?

- Decisions are hard, especially when you have lots of choices and uncertainty.

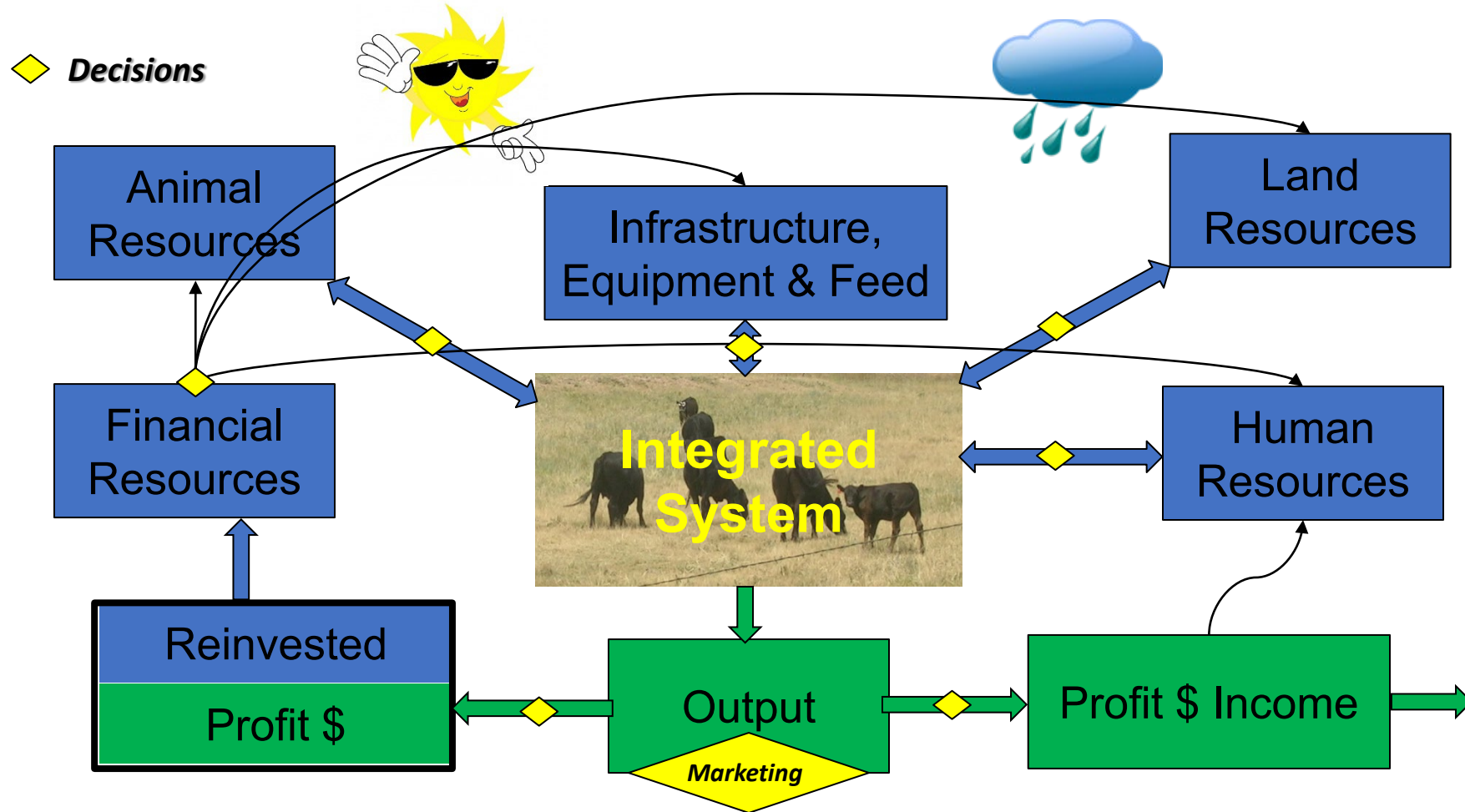


Agriculture is a Unique Decision-Making Environment

- Massive uncertainty (i.e. weather, markets, etc.)
- Family operations in a multiple range of sizes
- Government intervention
 - Incentive programs
 - Disaster programs
- Complex Systems
 - Biological
 - Environmental
 - Economically
 - Financial



Integrated Production System



Management

- The most powerful thing in the world for a manager is a decision.
- Good management is the process or art of making decisions which maximize the probability of achieving business goals.



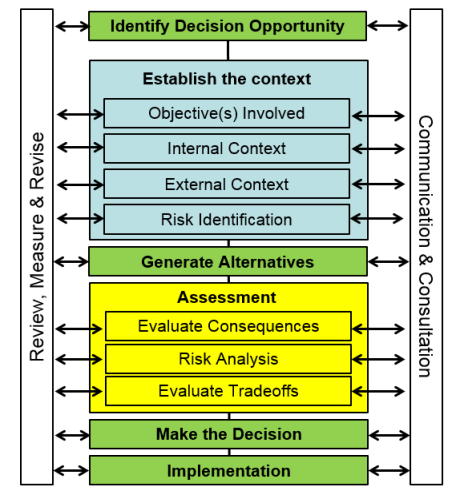
Why Bother Making Decisions?

- Decisions are your opportunity to maximize the probability of achieving your goals/objectives.
- Decisions are your opportunity to earn a competitive advantage.
- Decisions are the only way you can purposefully influence your life.
- Decisions are opportunities to shape the environment your future choices are made in.



Identify Important Decision Opportunities

Working with your classmates, write down important decisions ranchers make on a regular basis (i.e. annually, seasonally, etc.) or important decisions that many ranchers will make this year or in the near future.



Some Important Decisions

- Strategic decisions guide future decisions in the direction of long-term goals and objectives.
- Irreversible decisions are difficult or impossible to completely undo
 - Irreversible decisions should be made with great care.
 - The most important aspect of doing so is making sure the irreversible choices that are made align with the overall management strategies.



Seven Characteristics of a Good Decision

An appropriate
decision frame

Clear values to
adhere to and
objectives you are
trying to accomplish

Creative alternatives
to choose from

Good information

Clear tradeoffs and
sound reasoning

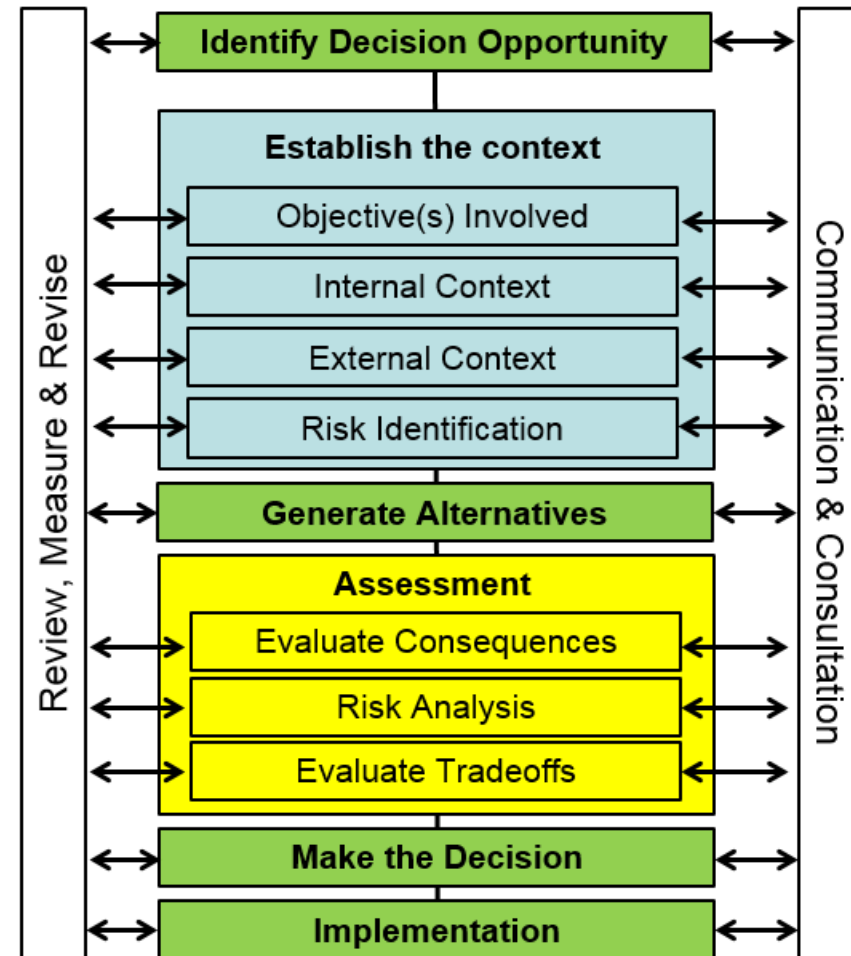
Choice alignment
with values and
objectives

Committed
implementation



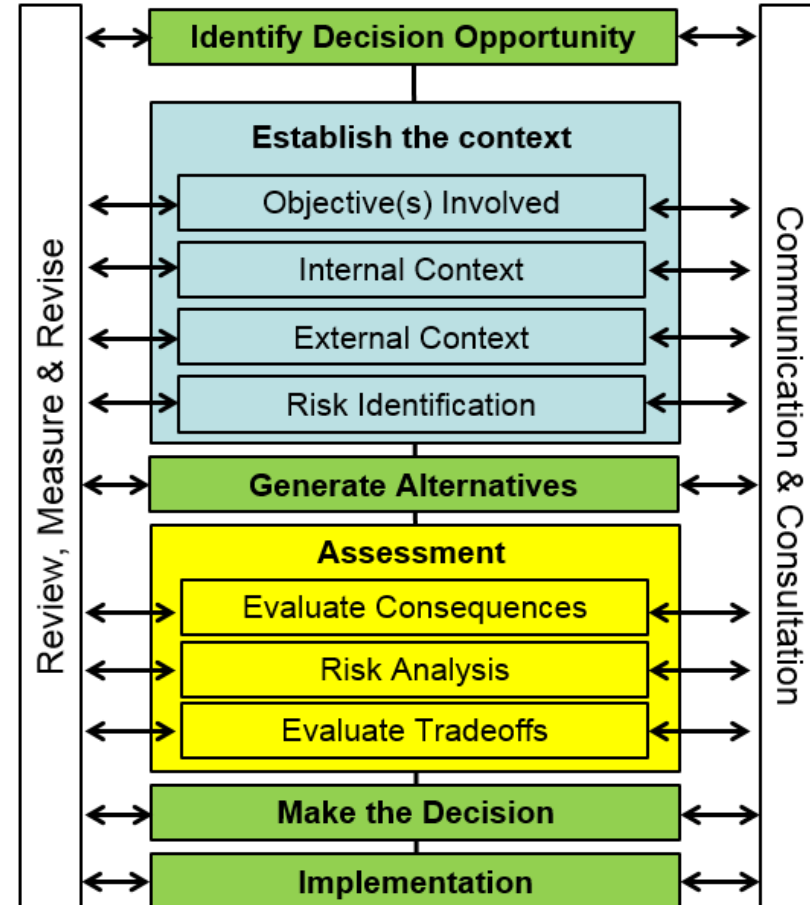
Smart Choices in Agriculture

- A decision-making process focused on creating desired outcomes more consistently while establishing a good risk management culture.
- It provides a robust decision-making framework while building proactive decision-making skills.



Five Key Principles of a Good Risk Management Culture

- Ability to anticipate decisions
- Adequate resources and capacity to respond to changing conditions
- Free flow of information into and throughout the organization
- Willingness to learn and adapt
- Risk management is embedded in all decision-making processes



Proactive Decision Making

- A decision should be viewed as an opportunity to make choices that help you accomplish your objectives.
- Decisions should not be viewed in the narrow context of problems to be solved.
- Focus on objectives first, then choices.
- Clear objectives help identify decision opportunities that lead to more smart choices.



Dimensions of Proactive Decision-Making

Cognitive Skills

Systematic identification of **objectives**

Systematic identification of **alternatives**

Systematic search for **information**

Using a '**decision radar**'

Proactive Decision-Making

Personality Traits

Taking **initiative**

Striving for **improvement**

Siebert and Kunz (2016)



Effects of Decision Training in the Nebraska Ranch Practicum

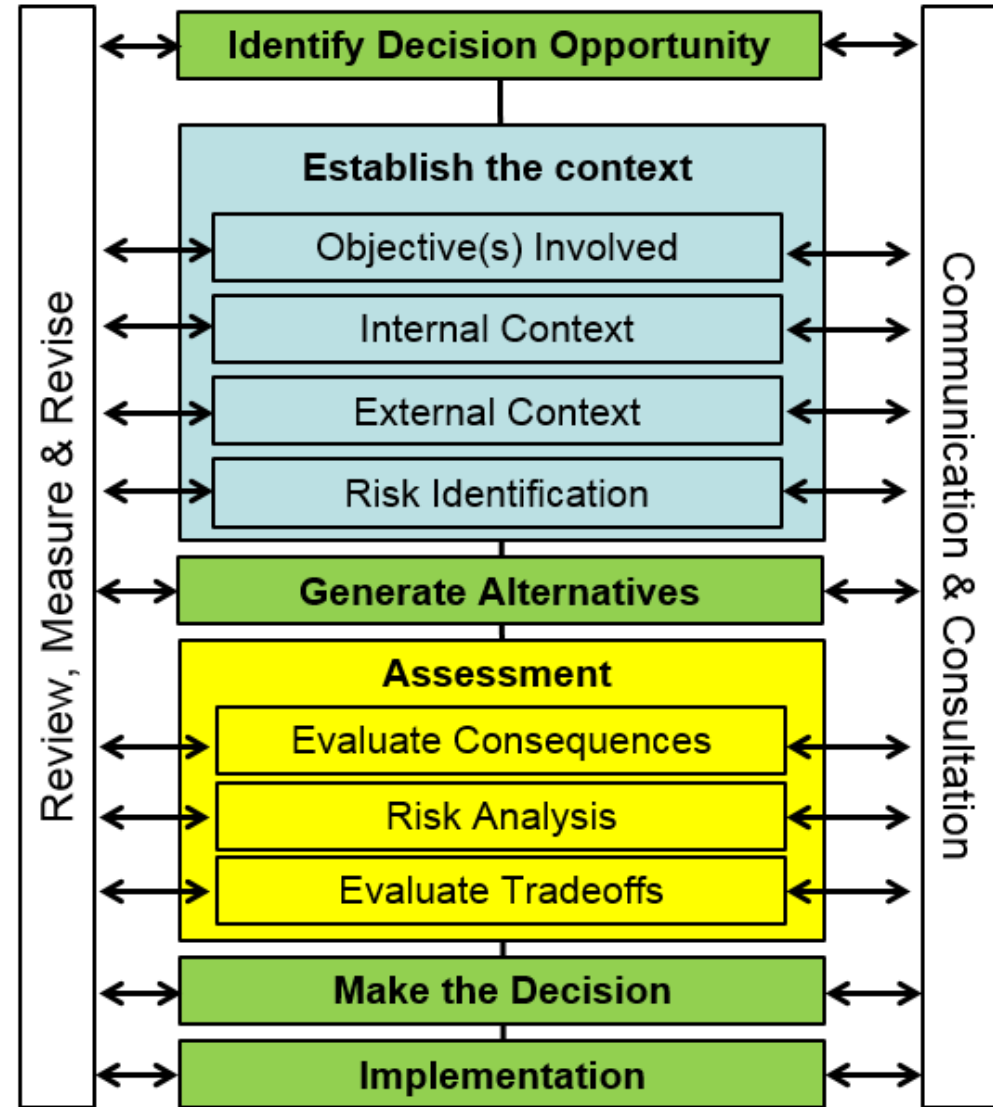
Dimension	Before Course	After Course	Δ Mean	<i>p</i> -value (t-test)
Cognitive Skills	5.0875	5.8145	0.7270***	.008
Objectives	5.2500	5.8077	0.5577*	.061
Alternatives	4.8917	7.9973	3.1056**	.049
Information	5.1875	8.4298	3.2423**	.033
Decision Radar	5.0400	5.6000	0.5600*	.061
Personality Traits				
Initiative	4.6000	5.0000	0.4000	.262
Improvement	5.2000	5.5385	0.3385	.239

Significance Levels: ***<1%, **<5%, *<10%



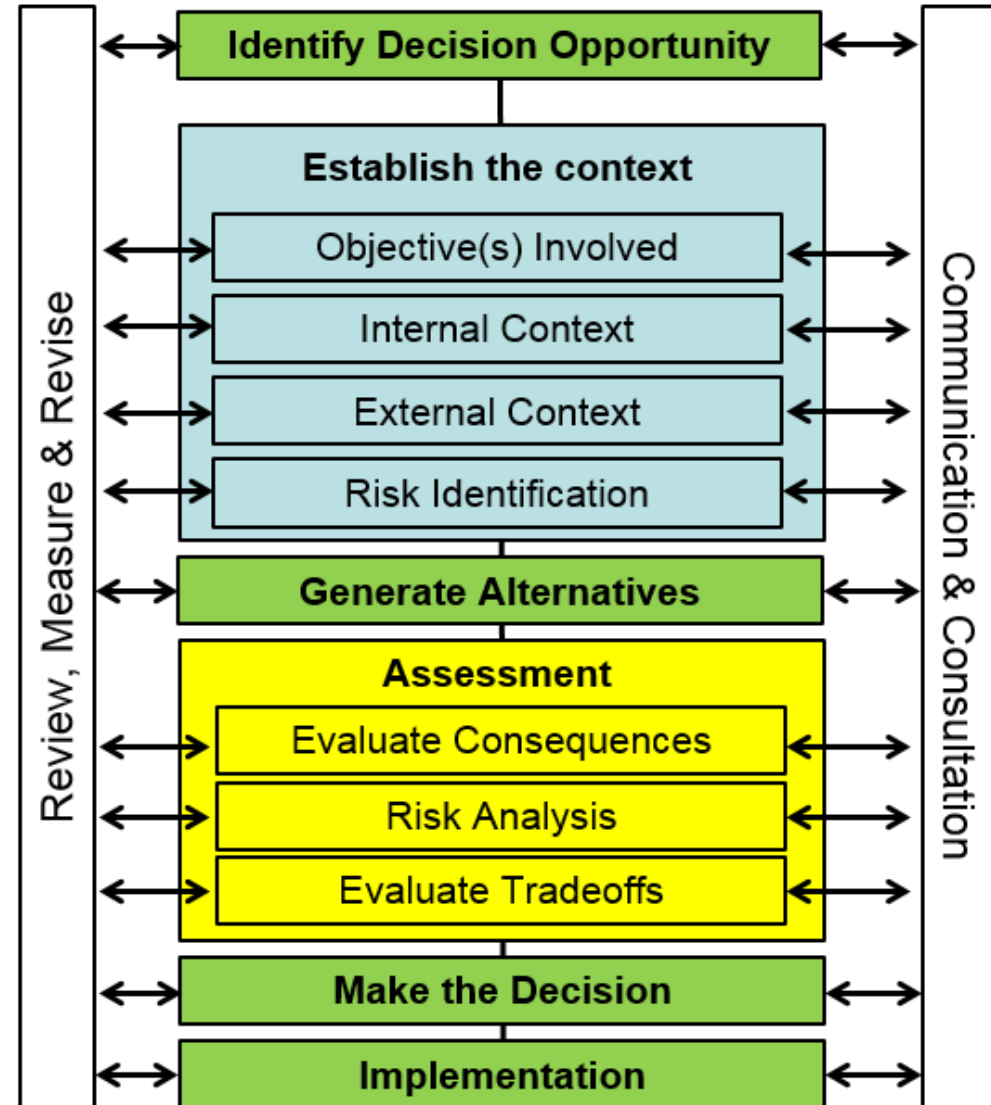
Identify Decision Opportunity

- Recognize opportunity to make a choice
 - Alternatives (choices to choose from)
 - Objective(s) (reason(s) to choose)



Identify Decision Opportunity

- Recognize opportunity to make a choice
 - Objective(s) (reason(s) to choose)
 - Alternatives (choices to choose from)



Objective Focused Thinking

- A full, clear set of objectives is the key to making good decisions consistently.
- Clear objectives
 - help identify choices you can make
 - help determine the information you need
 - help determine the importance of decisions
 - speed up the evaluation of your decision choices
 - help explain the choices you make to others.



Definitions

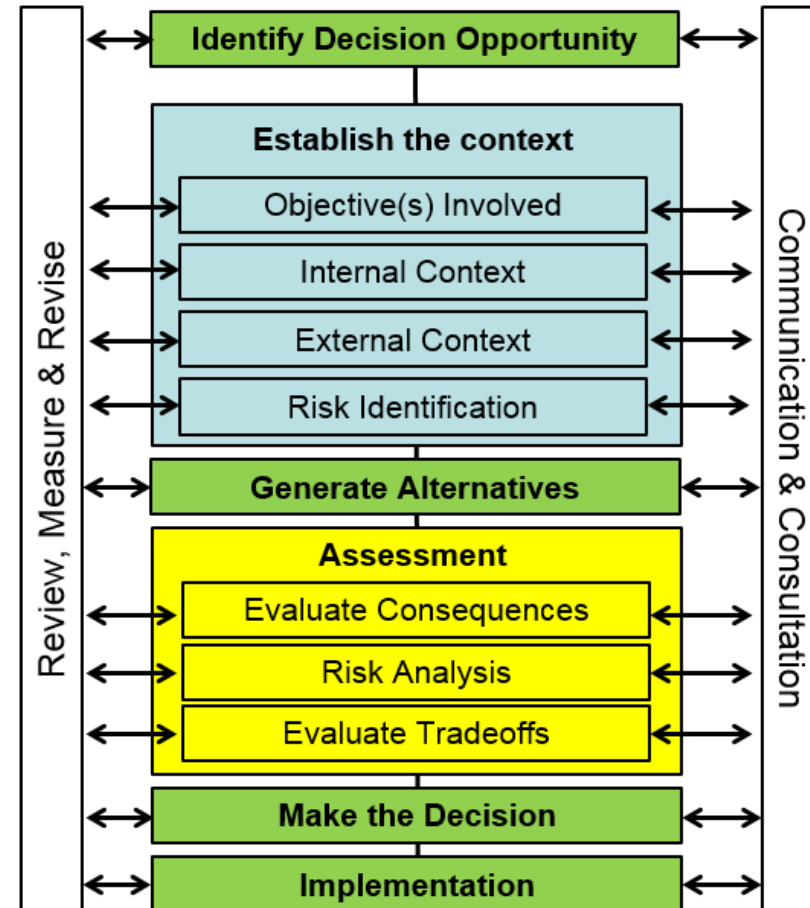
- Attributes – things you value and measure (profit, debt, happiness, etc.)
- Objectives – directions of improvement of one or more attributes like increasing profit or decreasing debt, etc.
- Goals – combining an attribute with an acceptable target level of achievement.

Goal: Debt reduced to less than 20% of asset value.



Establish the Context

Identify the objectives you are trying to achieve by making the decision.



The Art of Identifying Objectives

- Step 1: Write down what you are trying to accomplish with your decision.
 - Wish List: What would make you really happy?
 - Worst Outcome: What do you most want to avoid?
- Step 2: Convert your concerns into short, clear statements of what you want to accomplish
- Step 3: Separate the ends from the means to establish your fundamental objectives – *keep asking “Why?”*
- Step 4: Test your objectives to see if they capture your interests
 - Consider several alternative choices you could make that are consistent with objectives. Can you live with the results?
 - Can your objectives help you explain your decisions to someone else?
- Step 5: Clarify and adjust as needed.

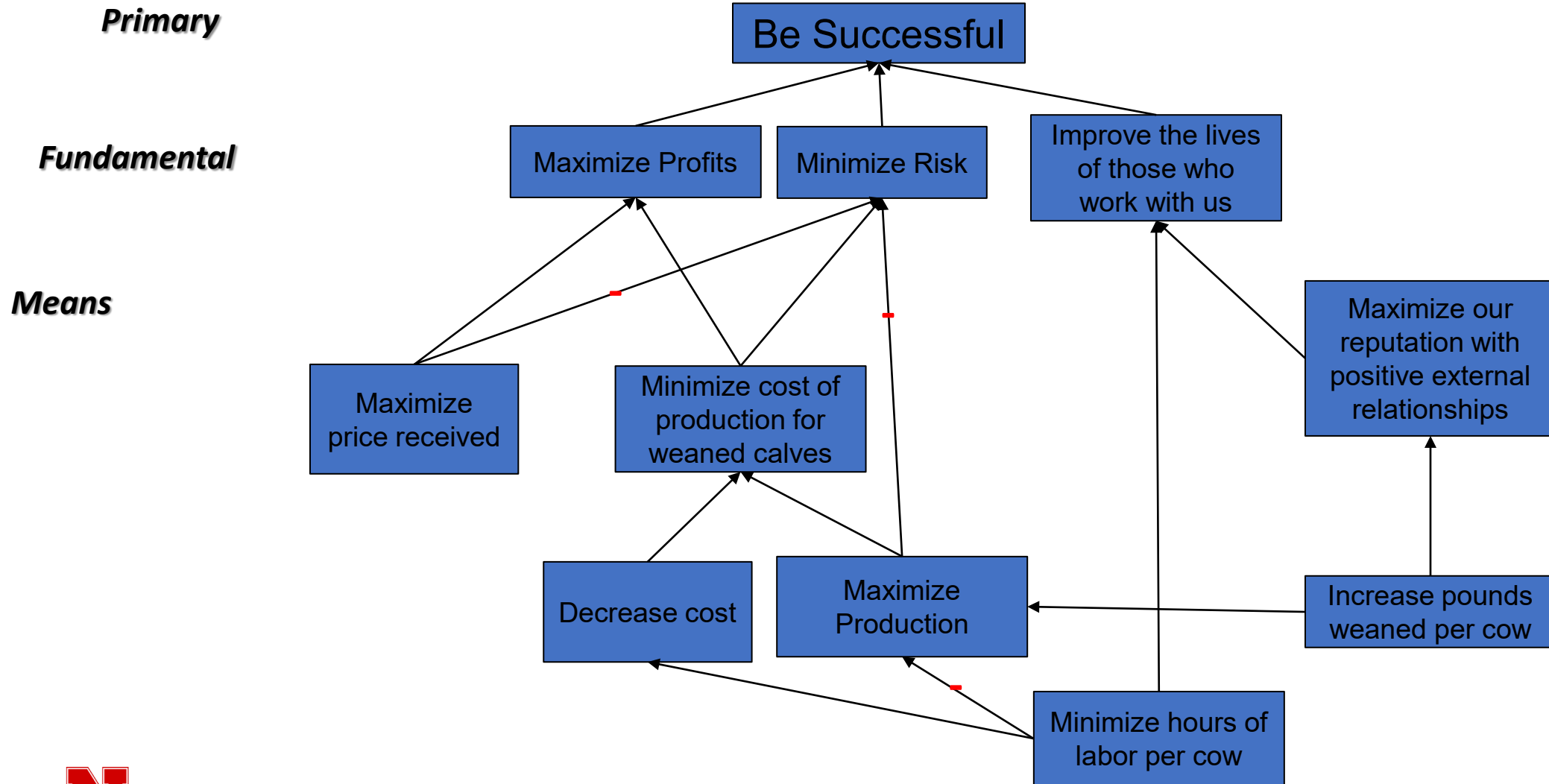


Fundamental vs. Means Objectives and Goals

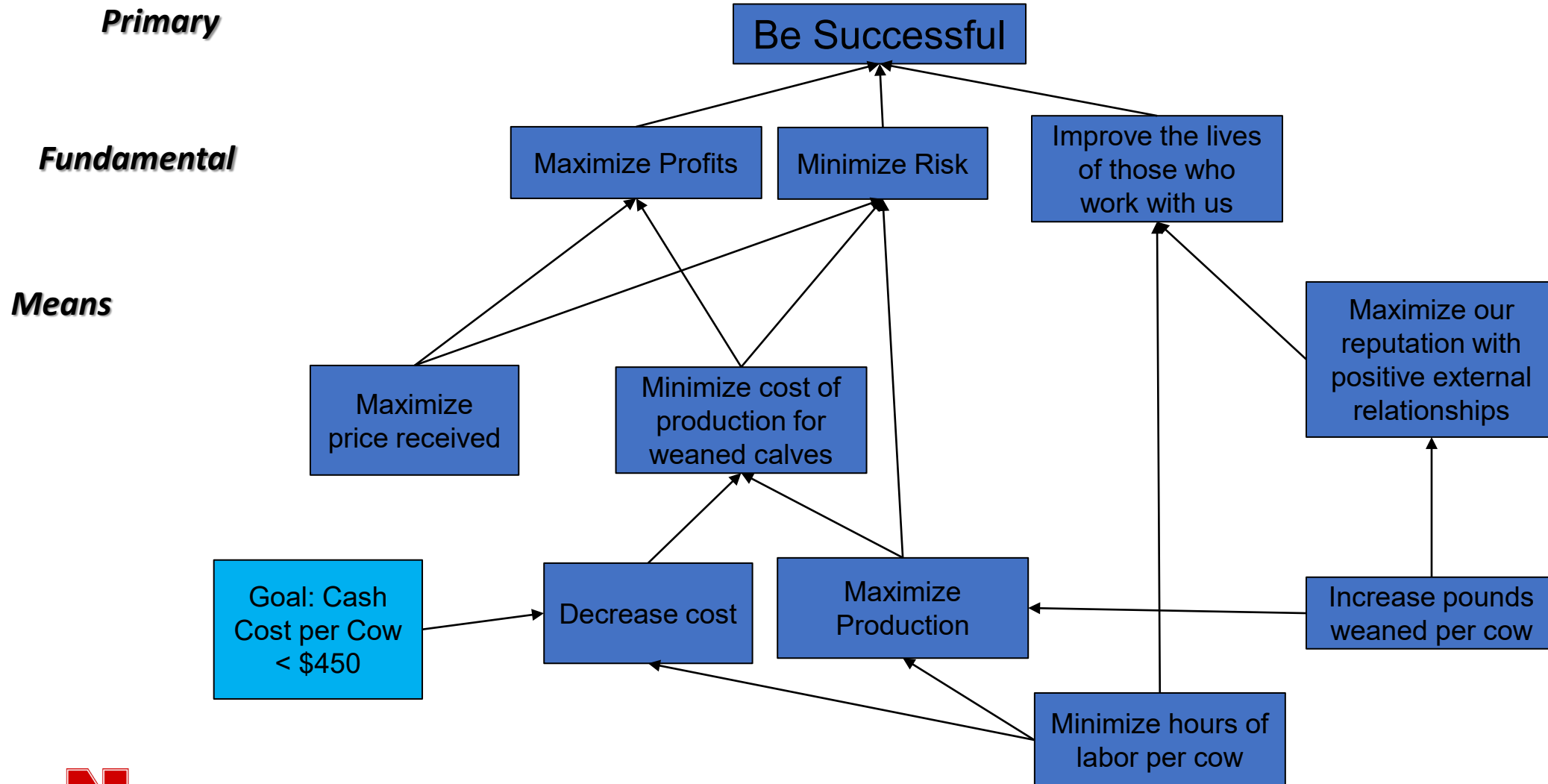
- Fundamental objectives capture the fundamental reasons behind your decisions.
 - They help you evaluate alternatives.
- Means objectives lead you toward accomplishing your fundamental objectives.
 - They help you identify alternatives.



Objectives Hierarchy

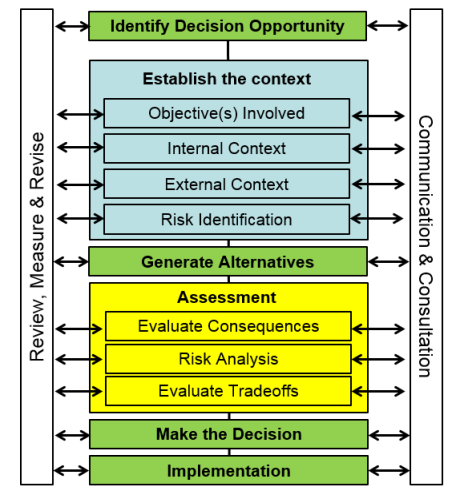


Objectives Hierarchy



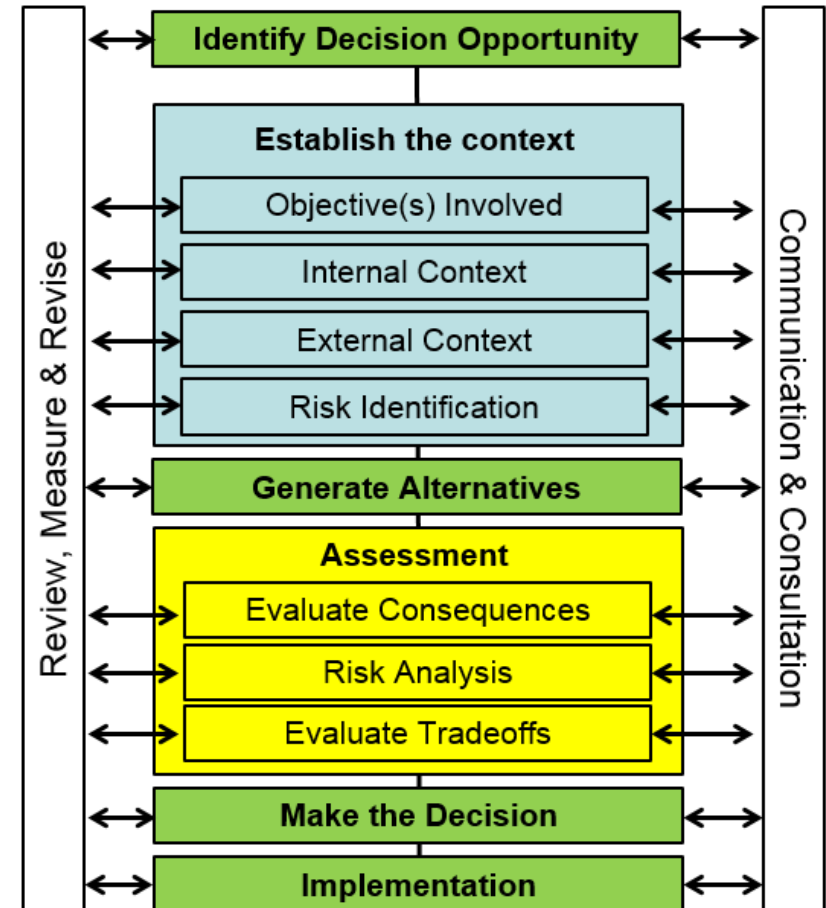
Establish the Context: Objectives

Working with your classmates, identify and write down important objectives ranchers (i.e. you) are trying to achieve with the decision(s) made.



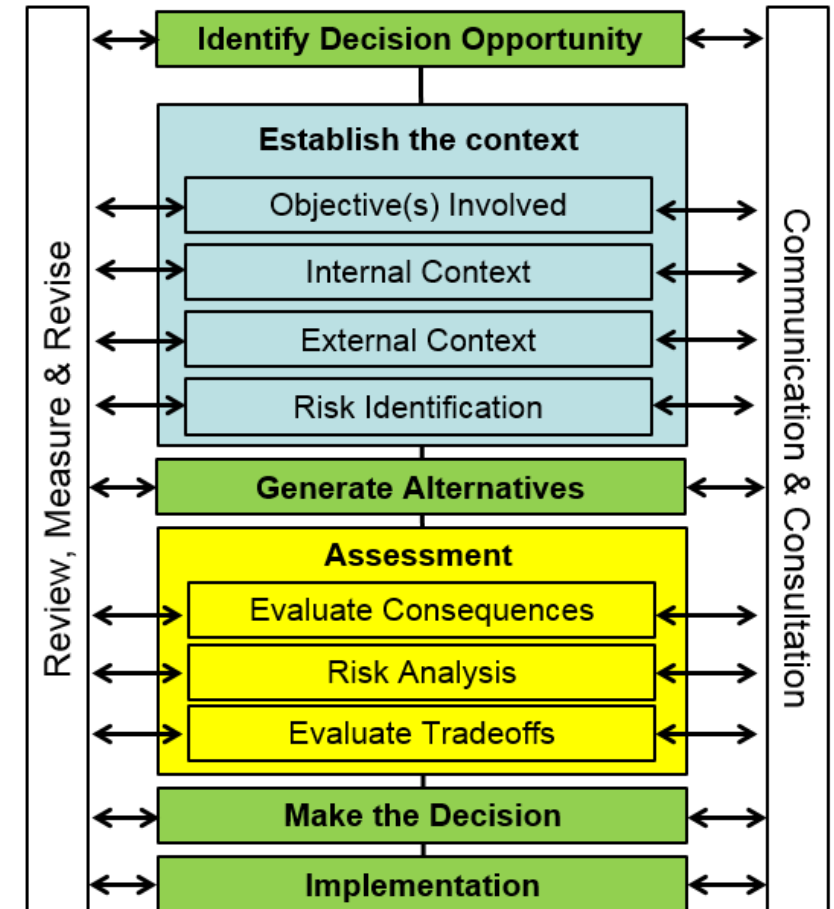
Establish the Internal Context

- What is the situation within the organization?
 - Strategies and policies
 - Resources
 - Structure (roles, responsibilities)
 - Knowledge, skills, and resources
 - Relationships
 - Strengths and weaknesses



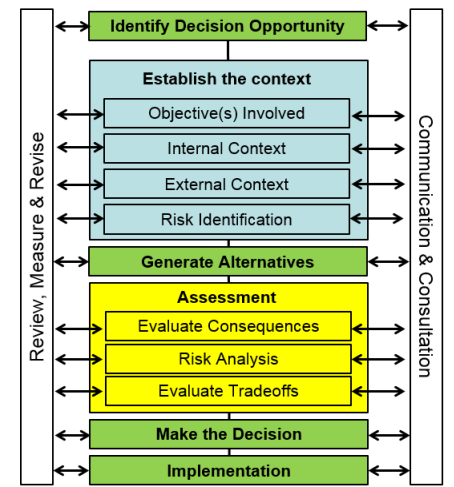
Establish the External Context

- What is the situation outside the organization as far as the environment you are making the decision in?
 - Trends and key drivers
 - Perceptions of key stakeholders
 - Economic situation (markets, etc.)
 - Social and political environment
 - Technological environment
 - Environmental and legal situation
 - Opportunities and threats



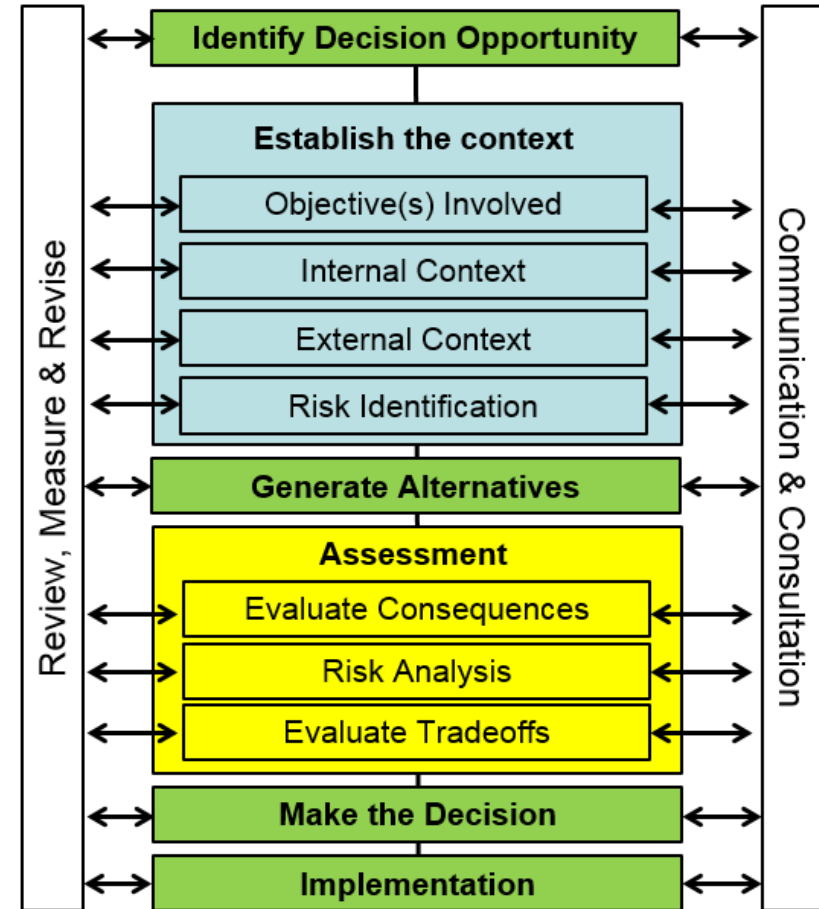
Establish the Context

Working with your classmates, identify and write down important information that provides internal and external context to the decisions to be made.



Risk Identification

- What are the risks and uncertainties involved in your decision?
- What uncertainties could affect your ability to achieve your objectives?
- Worst case scenarios?
- Best case scenarios?
- Probabilities?



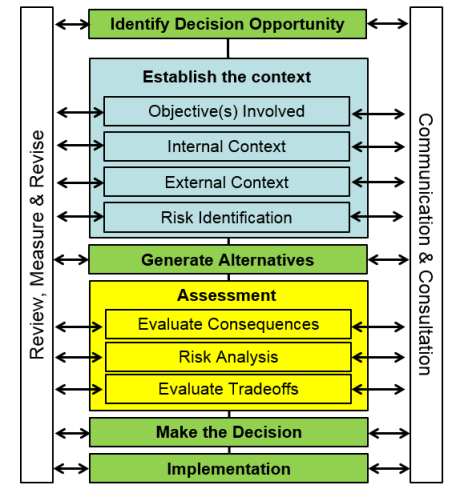
Sources of Risk in Agriculture

1. Marketing/Price Risk
2. Production Risk
3. Institutional/Legal Risk
4. Human Risk
5. Financial Risk



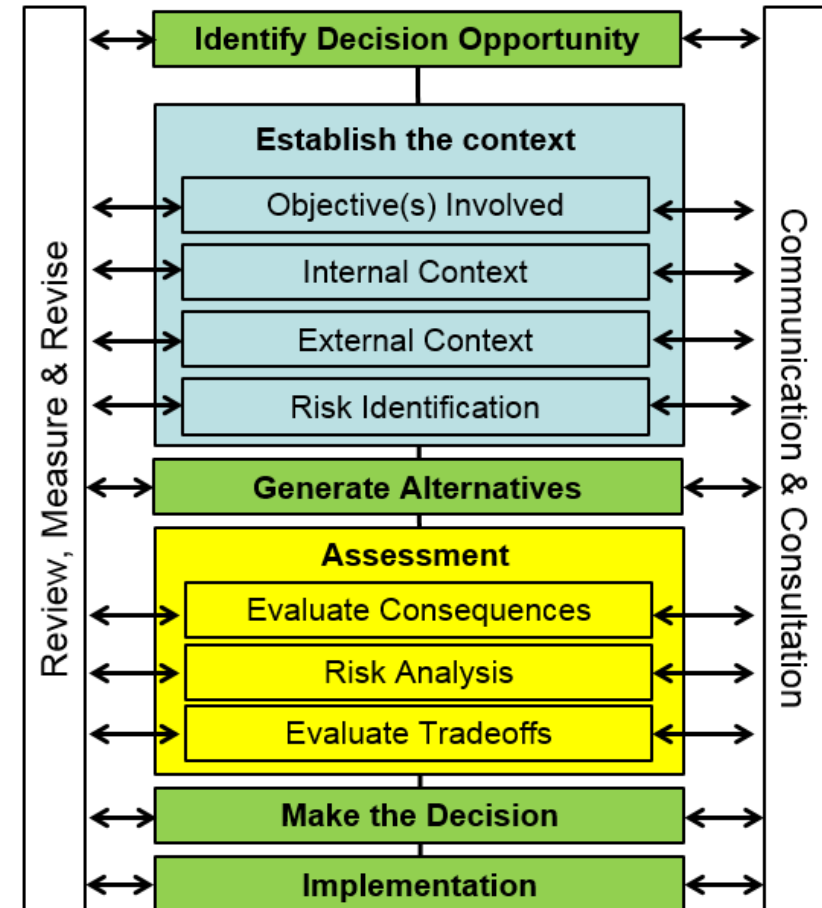
Establish the Context

Working with your classmates, identify and write down important risks and uncertainties about the information involved in the decisions to be made.



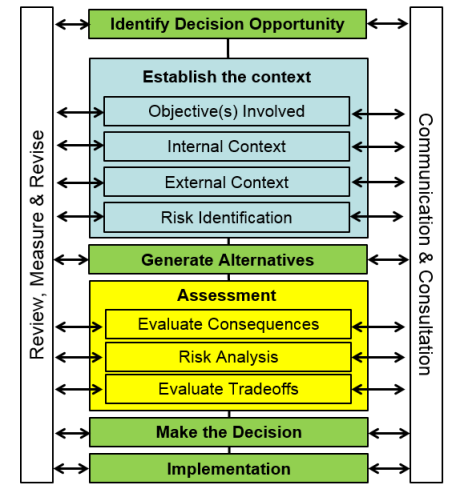
Generate Alternatives

- Alternatives are possible courses of action
- Ask “How can I accomplish my objectives?”
- Be creative and imaginative
- Challenge constraints
- Do your own thinking first.
- Ask others for suggestions.
- Keep an open mind!
- Iterate and generate better alternatives



Generate Alternatives

Working with your classmates, identify and write down alternative actions you can take to achieve ranch management objectives.

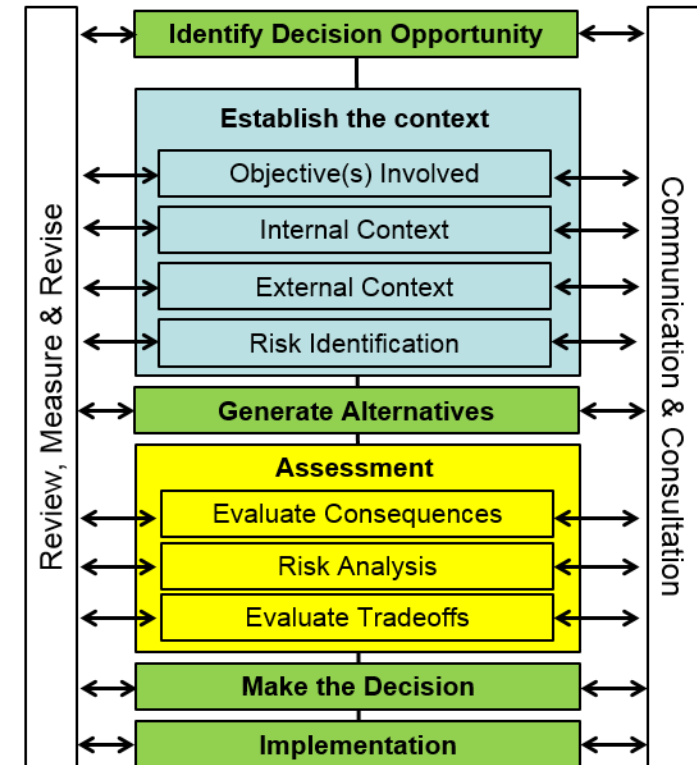


Two Pillars of Success

***Can you improve your understanding of the context in which you are making the decision? Better information? More clearly stated objectives?
Can you identify additional, better alternatives to choose from?***

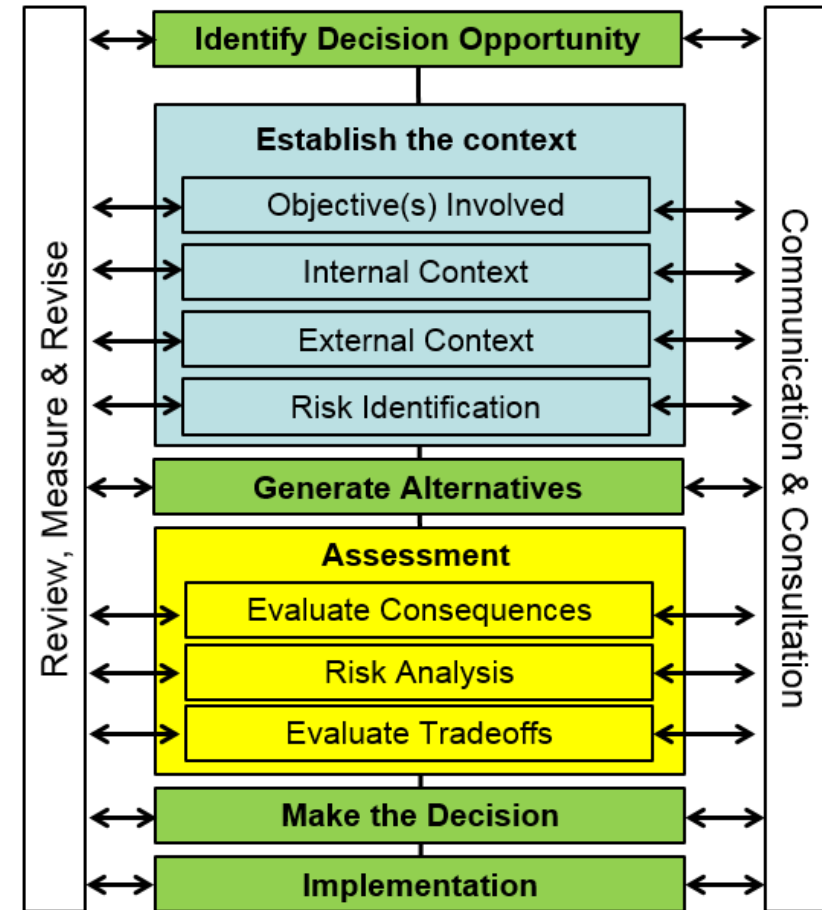
Communication & Consultation: Who can you talk to?

Review, Measure, Revise: What needs updated?



Assessment

- Evaluate Consequences
 - How well does each alternative address the objectives associated with the decision?
 - Consider linked decisions
- Risk Analysis
 - Clarify uncertain consequences
 - Ranges & probabilities
 - Clarify risk sources
 - Incorporate risk tolerance into decision
- Evaluate Tradeoffs
 - Look to simplify decision
 - Ignore irrelevant objectives
 - Eliminate dominated alternatives
 - Pairwise comparisons
- Use appropriate scales and be realistic about precision.



Identify Decision Opportunity



What should I do to comply with my CRP requirements?

Timeline for Making the Decision:

Production practice must be completed by Sep. 30



Objectives Hierarchy

Primary

Be Successful

Fundamental

Maximize Profits

Minimize Hassle

Meet CRP
Contract
Requirements

Means

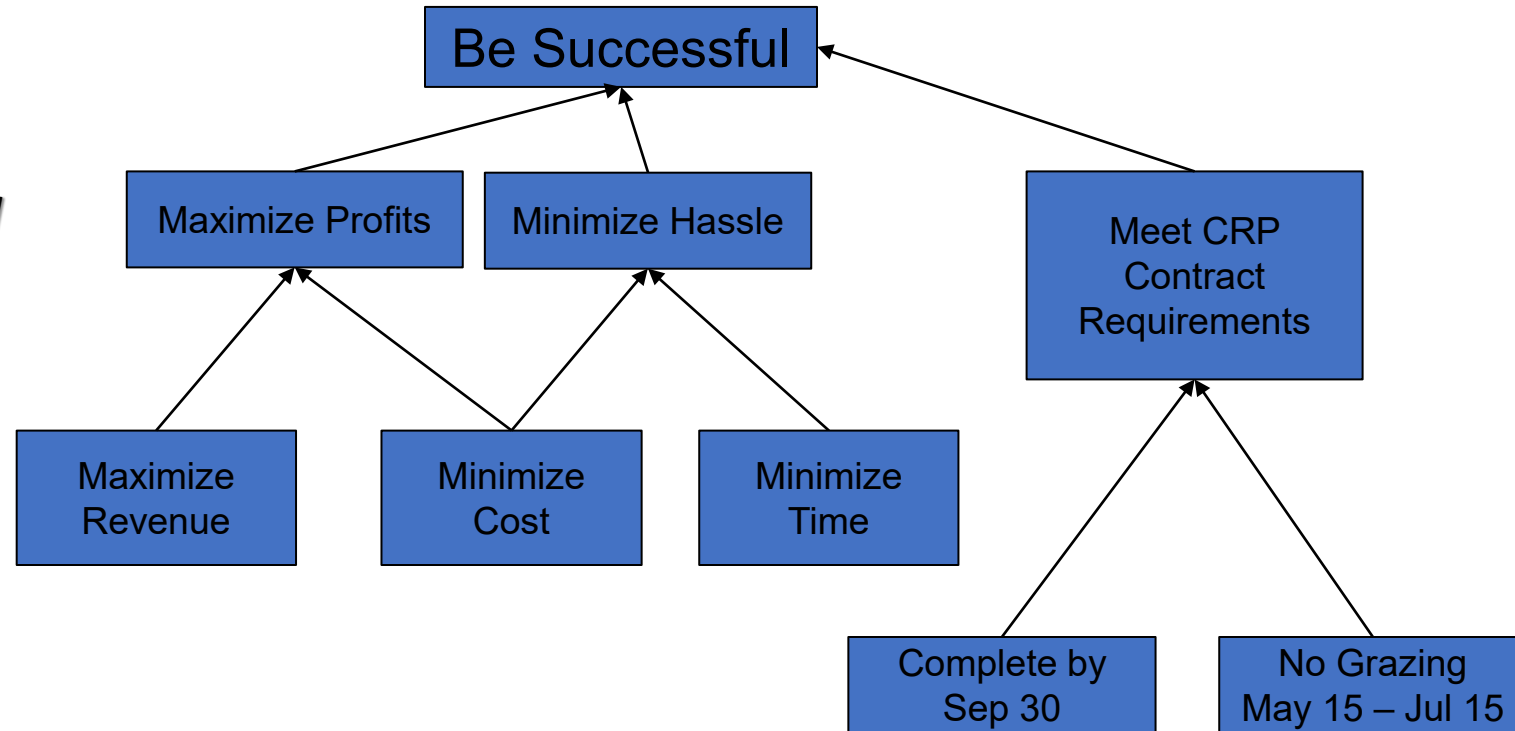
Maximize
Revenue

Minimize
Cost

Minimize
Time

Complete by
Sep 30

No Grazing
May 15 – Jul 15



Establish the Context

Internal Context:

Good water source for livestock
No fencing
Grazing practice approved with FSA
Good nearby grass can be used too
Growing wheat nearby
I don't have cattle but renter does
Renter relationship is good
Good relationship with FSA office
Spring is a busy time
Long distance to property

External Context:

Nearby road provides access
Cattle markets are down
Hay prices are down
Grazing land is fairly expensive
Strict CRP rules within FSA



Risk Identification

Risk and Uncertainties:

Time required could vary greatly

Extra expenses

Weather could affect production performance and land condition

Livestock markets could go up or down

Animal handling liability

FSA could view practice unfavorably or favorably

Uncertain future value of any investments

NOTE: Recognize linked decisions and timing of those decisions relative to risk and uncertainty



Evaluate Consequences

Consequences:

Objective Consequences

Alternatives

		Profit (\$)	Time (0-none; 3-lots)	CRP req.
1.	Renter/temp fence	\$0	0	1
2.	Highest bidder/no fence	\$1600	1	1
3.	Own stockers/temp fence	\$2600	3	1
4.	Install fence/advertise	\$3000*	2	1
5.	Approach FSA/alt.	-\$1000	2	1
6.	Partner with renter	\$1300	1	1

***Fence amortized over 30 years**



Risk Analysis

Risk:		Risk Analysis									
		Consequences					Risk Sources (+ uncertainty)				
Alternatives	<ol style="list-style-type: none"> <i>Renter/temp fence</i> <i>Highest bidder/no fence</i> <i>Own stockers/temp fence</i> <i>Install fence/advertise</i> <i>Approach FSA/alt.</i> <i>Partner with renter</i> 	Time		Profit			Market	Production	Institutional	Human	Financial
		Likely	Worst	Worst	Likely	Best					
		0	1	200	0	350			+		
		80%	20%	10%	80%	10%					
		1	2	1000	1600	2500	+	+	++		
		70%	30%	25%	50%	25%					
		3	3+	2100	2600	4000	+++	++	+	++	+++
		90%	10%	30%	60%	10%					
		2	3	3000	3000	3500	+	+	++		+++
		80%	20%	10%	80%	10%					
2	3	2000	1000	0			+		+		
90%	10%	20%	70%	10%							
1	2	200	1300	2000	++	++	+	+	+		
80%	20%	10%	60%	30%							



Objectives Hierarchy

Primary

Be Successful

Fundamental

Maximize Profits

Minimize Risk

Minimize Hassle

Meet CRP
Contract
Requirements

Means

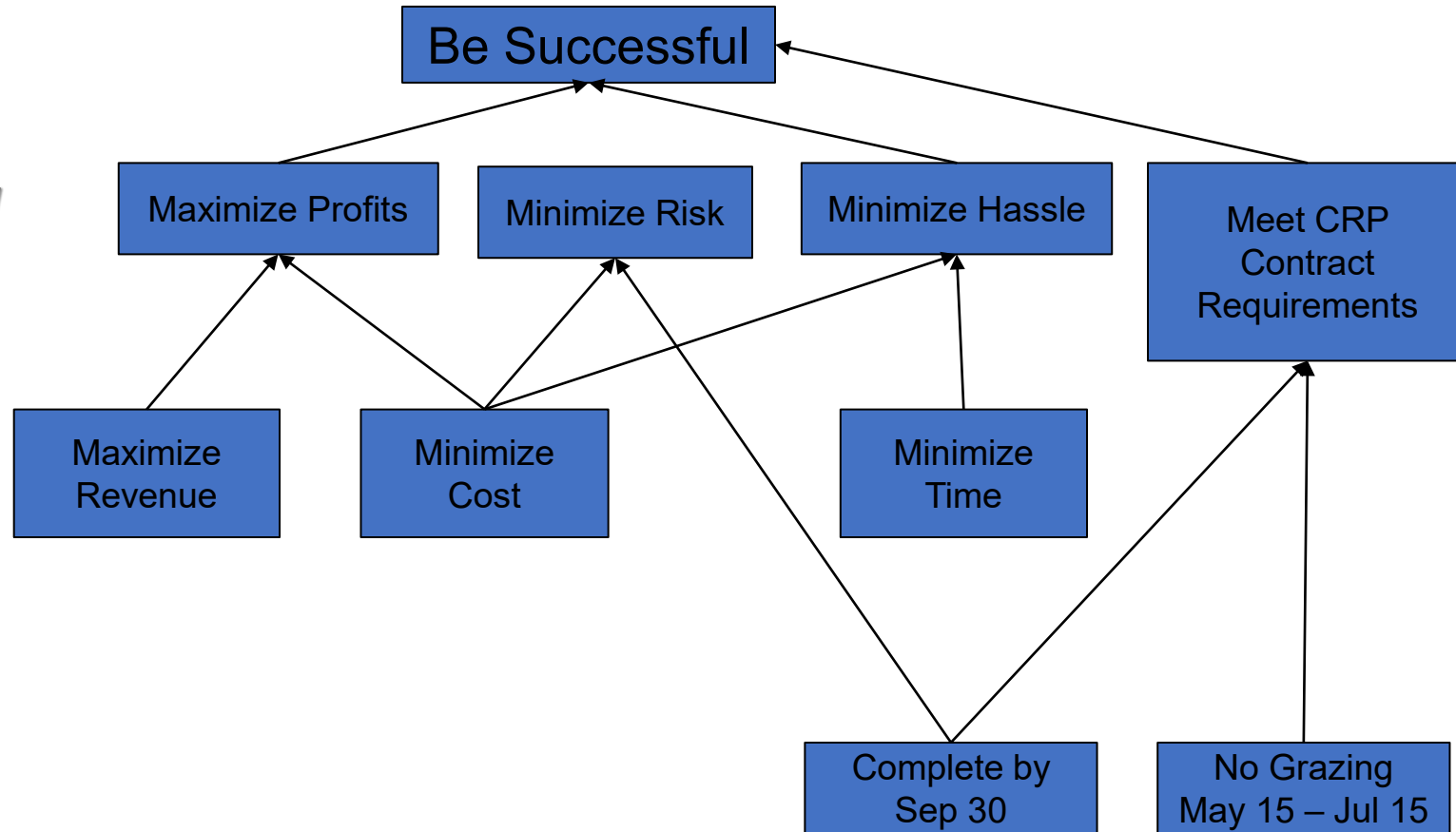
Maximize
Revenue

Minimize
Cost

Minimize
Time

Complete by
Sep 30

No Grazing
May 15 – Jul 15



Evaluate Tradeoffs

Risk:		Risk Analysis											
		Consequences					Risk Sources (+ uncertainty)						
Alternatives		Time		Profit			Market	Production	Institutional	Human	Financial		
		Likely	Worst	Worst	Likely	Best							
		1.	Renter/temp fence	0	1	200	0	350			+		
				80%	20%	10%	80%	10%					
		2.	Highest bidder/no fence	1	2	1000	1600	2500					
				70%	30%	25%	50%	25%	+	+	++		
		3.	Own stockers/temp fence	3	3+	2100	2600	4000					
				90%	10%	30%	60%	10%	+++	++	+	++	+++
		4.	Install fence/advertise	2	3	3000	3000	3500					
				80%	20%	10%	80%	10%	+	+	++		+++
5.	Approach FSA/alt	2	3	2000	1000	0							
		90%	10%	20%	70%	10%			+		+		
6.	Partner with renter	1	2	200	1300	2000							
		80%	20%	10%	60%	30%	++	++	+	+	+		

Alternative (1) dominates Alternative (5).



Evaluate Tradeoffs

Risk:		Risk Analysis											
		Consequences					Risk Sources (+ uncertainty)						
Alternatives		Time		Profit			Market	Production	Institutional	Human	Financial		
		Likely	Worst	Worst	Likely	Best							
		1.	<i>Renter/temp fence</i>	0	1	200	0	350			+		
				80%	20%	10%	80%	10%					
		2.	<i>Highest bidder/no fence</i>	1	2	1000	1600	2500	+	+	++		
				70%	30%	25%	50%	25%					
		3.	<i>Own stockers/temp fence</i>	3	3+	2100	2600	4000	+++	++	+	++	+++
				90%	10%	30%	60%	10%					
		4.	<i>Install fence/advertise</i>	2	3	3000	3000	3500	+	+	+		+++
				80%	20%	10%	80%	10%					
6.	<i>Partner with renter</i>	1	2	200	1300	2000	++	++	+	+	+		
		80%	20%	10%	60%	30%							

Alternative (4) is better than Alternative (3).



Evaluate Tradeoffs

Risk:		Risk Analysis									
		Consequences					Risk Sources (+ uncertainty)				
Alternatives	<ol style="list-style-type: none"> 1. <i>Renter/temp fence</i> 2. <i>Highest bidder/no fence</i> 4. <i>Install fence/advertise</i> 6. <i>Partner with renter</i> 	Time		Profit			Market	Production	Institutional	Human	Financial
		Likely	Worst	Worst	Likely	Best					
		0	1	200	0	350			+		
		80%	20%	10%	80%	10%					
		1	2	1000	1600	2500	+	+	++		
		70%	30%	25%	50%	25%					
		2	3	3000	3000	3500	+	+	++		+++
		80%	20%	10%	80%	10%					
		1	2	200	1300	2000	++	++	+	+	+
		80%	20%	10%	60%	30%					



Objectives

Must be done by Sep. 30

Cannot graze from May 15 to July 15

Don't want it to be too big of hassle (low time)

Don't want it to cost too much & prefer to make money (higher profit)

Don't want to take on too much risk

Want a good relationship with renter to continue



Evaluate Tradeoffs

Risk:		Risk Analysis										
		Consequences					Risk Sources (+ uncertainty)					
Alternatives	1. <i>Renter/temp fence</i>	Time		Profit			Market	Production	Institutional	Human	Financial	
		Likely	Worst	Worst	Likely	Best						
			0	1	200	0	350			+		
			80%	20%	10%	80%	10%					
			1	2	1000	1600	2500	+	+	++		
			70%	30%	25%	50%	25%					
			2	3	3000	3000	3500	+	+	++		+++
			80%	20%	10%	80%	10%					
			1	2	200	1300	2000	++	++	+	+	+
			80%	20%	10%	60%	30%					



Evaluate Tradeoffs

Risk:

Risk Analysis

Alternatives	Consequences					Risk Sources (+ uncertainty)				
	Time		Profit			Market	Production	Institutional	Human	Financial
	Likely	Worst	Worst	Likely	Best					
1. Renter/temp fence	0	1	200	0	350			+		
	80%	20%	10%	80%	10%					
6. Partner with renter	1	2	200	1300	2000					
	80%	20%	10%	60%	30%	++	++	+	+	+

- (1) less time, less risk but less profit
- (6) more profit but more time and a lot more risk. It also has more potential for conflict with renter.



Evaluate Tradeoffs

Risk: _____

Risk Analysis

Alternatives	Consequences					Risk Sources (+ uncertainty)				
	Time		Profit			Market	Production	Institutional	Human	Financial
	Likely	Worst	Worst	Likely	Best					
1. Renter/temp fence	0	1	200	0	350			+		
	80%	20%	10%	80%	10%					
6. Partner with renter	1	2	200	1300	2000					
	80%	20%	10%	60%	30%	++	++	+	+	+

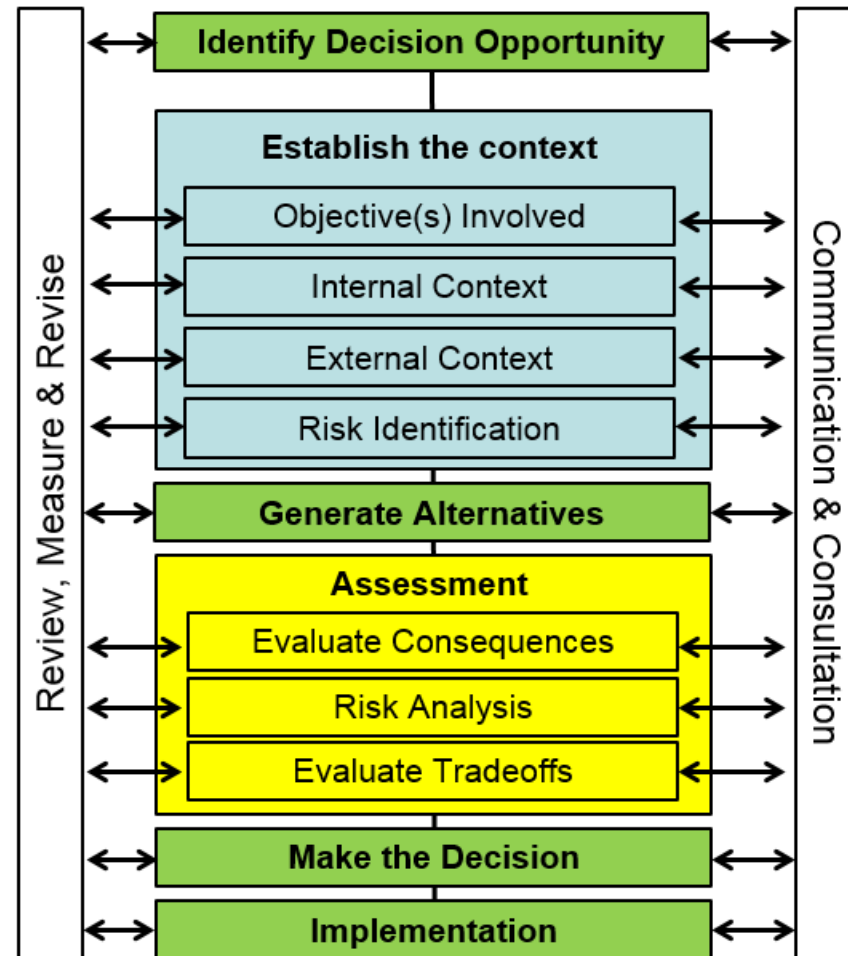
Decision:

1. Offer it to renter to put a temporary fence up and run cattle at no charge



Smart Choices in Agriculture

- A decision-making process focused on creating desired outcomes more consistently while establishing a good risk management culture.
- It provides a robust decision-making framework while building proactive decision-making skills.



Take Home Points

- Good decision-making skills can be learned.
- Focus on accomplishing objectives.
 - Proactively look for opportunities to make smart choices that lead to achieving objectives.
 - Systematically seek, process and evaluate information
- Embrace uncertainty
 - Imbed in decision making
 - Opportunity to manage to an advantage





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THANK YOU!

