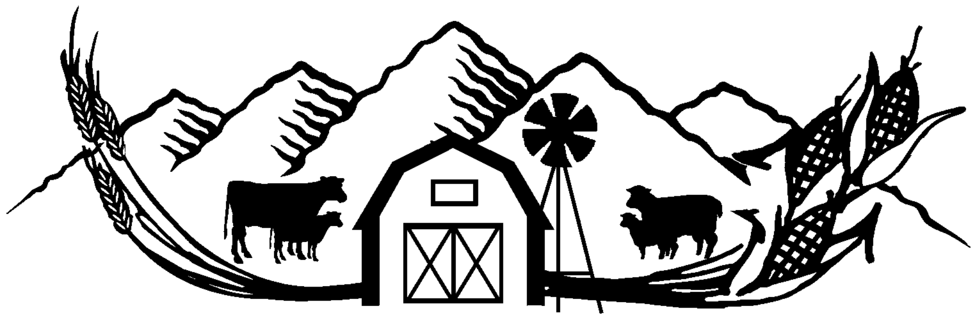

**Risk and Resilience in Agriculture**

# Defining Risk and a Framework for Moving Towards Resilience In Agriculture

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Farmers and ranchers make decisions in a risky environment every day. The consequences of their decisions are generally not known when the decisions are made. Furthermore, the outcome may be better or worse than expected. Variability of prices and yield are the biggest sources of risk in agriculture. Technology changes, legal and social concerns, and the human factor itself also contribute to the risk environment for agriculture producers. The two situations that most concern agriculture producers are: 1) is there a high probability of adverse consequences and 2) would those adverse consequences significantly disrupt the business.

## Risk, Uncertainty and Risk Management Defined

"Risk" and "uncertainty" are two terms basic to any decision making framework. Risk can be defined as imperfect knowledge where the probabilities of the possible outcomes are known, and uncertainty exists when these probabilities are not known (Hardaker). A more common usage of these terms would state uncertainty as imperfect knowledge and risk as uncertain consequences. If a person says " I am uncertain about the weather tomorrow,: this would be a value-free statement implying imperfect knowledge about the future. If this same person says " I am planning a picnic for tomorrow and there is a risk of rain", now he or she is indicating preference for an alternative consequence. Taking a risk can now be defined as exposing one's self to a significant chance of injury or loss.

Risk management can then be defined as choosing among alternatives to reduce the effects of risk (Harwood, et al). This requires an evaluation of tradeoff between changes in risk, expected returns and entrepreneurial freedom among others. The focus must be on the "risk that matters." This may involve the prospect of losing money, possible harm to human health, repercussions that affect resources or other events that affect a person's welfare.

For an individual farmer, risk management involves finding the preferred combination of activities with uncertain outcomes and varying levels of expected returns (Harwood, et. al.). From this point of view, risk management can be defined as choosing among alternatives for reducing the effects of risk on the farm or ranch, which in turn effects the farm or ranch's welfare position. Risk management strategies can 1) reduce risk within the operation, such as product diversification, 2) transfer risk outside the operation, such as production contracting or 3) build the operation's capacity to bear risk, such as maintaining liquid assets.

Risk management cannot be viewed as a "one size fits all" action. Several key decision-making criteria that play into the risk management planning process include the goals established for the operation, the risk bearing ability of the farm or ranch, and the manager's attitude towards risk. Each one of these items will be different for individual family members and each farm or ranch unit.

## Establishing Goals

An old adage says, "If you don't know where you are going, any road will get you there." The starting point in any planning process is to identify and specify goals. As a manager of a business venture, you need to know where you are going, how you intend to get there and when you plan an arriving. Answers to these questions come from your goals.

Goals are your personal statements which reflect your values and beliefs, the resources available to you and the limitations you face (Hewlett). They represent visions of the future and also provide a basis for comparing and judging alternative plans. Goals should direct and guide management decisions since they represent your future hopes and ambitions. With a written set of goals, consideration can be given to activities and resources needed to achieve these goals.

The composition of the management unit will determine the range of goals to be considered. For instance, a family farm operation will require personal, family and business goals. Each member of the family must determine their personal goals and share them with other family members. This process will identify common goals along with differences that must be dealt with. The keys for success here will be negotiation and compromise to determine the most important goals. With a common set of family goals set forth, business goals can be developed that will satisfy the family goals.

## Risk Bearing Ability

It was discussed previously that agricultural producers are most concerned about the probability of an adverse outcome and would that outcome significantly disrupt the business. In short this directly relates to the firm's risk bearing ability. The firm's risk bearing ability is directly related to liquidity and solvency measures.

Liquidity refers to the ability of a business to meet financial obligations as they come due without hurting the normal operations of the business (Kaan). It is a measure of a firm's ability to repay current debts by converting current assets into cash. Liquidity is a short run concept since it deals with current assets and liabilities. In general, the more cash that is available to pay current debts, the more liquid the firm is said to be.

Solvency is a measure of the firm's risk bearing ability. Solvency measures provide an indication of the firm's ability to repay all financial obligations if all assets are sold. It also can indicate the ability to continue as a viable business after a financial adversity strikes that would increase debt or reduce equity. Solvency is a long run concept since these measures deal with the ability of the business to survive in the future.

Risk bearing ability is also affected by cash flow requirements. Cash flow requirements are the obligations for cash costs, taxes, loan repayment, and family living expenses that must be met each year. The higher these obligations as a percentage of total cash flow, the less able the farm is to assume risk.

## Risk Attitudes

A manager's attitude towards risk is not a reflection of him or her management ability. There are no right or wrong risk attitudes. For each operation and manager, circumstances factoring into any decision-making process are different. The emphasis needs to focus on knowing your risk attitude and using that information in decision-making. An improved understanding of risk attitudes can help in analyzing investments or business alternatives as well as making day-to day decisions.

Risk attitudes can be divided into three types: risk averse, risk preferring and risk neutral (Boehlje). Risk overters, or avoiders, are characterized as more cautious individuals with preferences for less risky sources of income or investment. In general, this individual will sacrifice some level of expected return in order to reduce the possibility of a loss. A person who is considered risk averse likely will also have a low risk bearing ability. Their situation would be such that a large income loss would seriously disrupt or end the business.

Risk preferring individuals are characterized as more adventuresome with a preference for more risky business ventures. Risk preferrers will select the alternative with some probability of a higher outcome. In order to get this higher income, this person must also accept a probability of a lower outcome compared to the risk averter. This person likely has a greater risk bearing ability and therefore is less concerned with the increased probability of a lower outcome and primarily focuses on the higher outcome potential.

The risk neutral person is the limiting case between the risk averse and risk preferring individuals. This person will select the alternative with the highest expected outcome, regardless of the probabilities associated with potential gains or losses. This person will have acceptable levels of risk bearing ability such that large losses are not of concern but at the same time, achieving the highest outcome is not the focus either. The primary concern is to achieve a sustainable outcome over time.

Risk attitudes will change over time as goals, financial resources and a manager's experience change over time. Along with these variables, the probability and size of a gain or loss will effect a managers risk attitude. The key is to be aware of your risk attitude and utilize it in the decision-making and planning process.

## Business Planning

The document that ties all of these ideas and concepts together is a business plan. Development of a business plan will be guided by the goals set forth for the family and business. The risk bearing ability of the operation and the risk attitudes of the people involved will set the parameters to select alternative enterprises. The process of business planning will create opportunities for discussions between farm family members allowing each person the opportunity to share their thoughts and dreams for the future. As farm businesses continue to grow, more complex and producers interact with more individuals, the need for a formal business plan will also increase.

Today's successful agricultural producers are businessmen first, and farmers second. This statement will become truer as we move into the new millenium. Continued success in this risk-laden world of agricultural production will be determined largely by the ability to anticipate and prepare for the future. The basic element that will guide producers in the decision-making process is a business plan. It is a formalized thought process where producers assess their current situation, specify their goals, identify and implement alternatives for reaching their goals and monitoring progress towards the goals. The emphasis is on the long-term goals; five, ten, fifteen or more years in the future.

A business plan will serve as a framework to develop short-term production and marketing plans. As such, it will be designed to be flexible as the environment surrounding the business changes. Another aspect is this is not a one-time process. The business plan will need to be reviewed and adjusted at regular intervals. Any number of the factors the original business plan was based on can and will change and so the plan also needs to change accordingly.

Several positive results will come from a business planning process. First, a producer will thoroughly understand the business and can determine how a current decision will impact the long-term success of the operation. The process also encourages thought regarding 1) alternatives for the farm business, 2) risks inherent in available opportunities and 3) contingency plans to follow when obstacles arise. Secondly, a producer will remain focused on the overall purpose of the business. With long-term goals written out, a manager can always overcome current problems and not lose sight of the long-term goals of the business.

## References


Boehlje, Michael D., Vernon R. Euidman. Farm Management, New York: John Wiley and Sons, Inc. 1984.

Hardaker, J. Brian, Raud B.M. Huirne, and Jock R. Anderson, Coping With Risk in Agriculture, New York: CAB International, 1997.

Harwood, J.R. Heifner, K. Coble, T. Perry, and A. Somwaru. Managing Risk in Farming: Concepts, Research and Analysis. Agricultural Economic Report No. 774. Market and Trade Economic Division and Resource Economics Division, Economic Research Service U.S. Department of Agriculture. March, 1999.

Hewlett, J., K, Drake, G. Gade, A. Gray, F. Henderson, J. Jacobs, J. Jenkins, R. Weigel. Western Integrated Ranch/Farm Education. University of Wyoming Cooperative Extension Service, 1995.

Kaan, D., Understanding Your Financial Situation. Managing for Today's Cattle Market and Beyond. University of Wyoming Cooperative Extension Service.

Patrick, George F., Managing Risk in Agriculture. NCR-406. Cooperative Extension Service, Purdue University. May,1992.