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MANAGING RISK AND UNCERTAINTY TO ENHANCE PROFIT OPPORTUNITIES IN HORTICULTURAL PRODUCTION

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Introduction:

Since time immemorial, human beings have tried to manage risks faced in their day-to-day life. Keeping inflammable material away from fire, saving for possible future needs, creation of a legal will are all examples of attempts at managing risk. Risk is the possibility of the actual outcome being different from the expected outcome. It includes both the downside and the upside potential. Downside potential is the possibility of the actual result being adverse compared to the expected results. On the other hand, upside potential is the possibility of the actual result being better than the expected results, Anonymous, (2001).

Risk and Uncertainty

Although the terms risk and uncertainty are often used interchangeable, they are in fact not synonymous. There is a clear distinction between certainty, uncertainty and risk. Certainty is the situation where it is known what will happen and the happening or non-happening of an event carries a 100% probability. Risk is the situation when there are a number of specific, probable outcomes, but it is not certain as to which one of them will actually happen. Uncertainty is where even the probable outcomes are unknown. It reflects a total lack of knowledge of what may happen, Anonymous (2001).

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Risk, Peril and Hagard:

Risk is different from the terms 'peril' and 'hazard' while risk is the possibility of a loss, peril is a cause of loss. Hazard, on the other hand, is a factor that may create or increase the possibility of a loss in face of an undesired event, or may increase the possibility of the happening of the undesired event. For example, fire is a peril that may cause loss. Inappropriate structure of a building is a hazard that increases the possibility of a loss in case of a fire. Inappropriate wiring is a hazard that increases the probability of a fire. Risk is the possibility of a loss due to these factors. Anonymous, (2001).

Ray 2011 stated that risk has always been an integral part of horticultural production is no exception. Policy and other changes in the recent past have shifted the burden of risk increasingly onto the farmer's shoulders. Farmers often face multiple, often simultaneous, sources of risk e.g. weather, insect pests, diseased, glut and low market prices, government policies, regulations, and more.

In view of this, a farmer's business strategy must comprise there types of risk management. 1. Normal risk is frequent but not too damaging and is typically managed at the farm or household level – for example, small variations in price or yield. General tax, health and social systems help to manage such risks. 2. Potentially insurable risks, such as hail damage or windstorm risk, have intermediate levels of frequency and magnitude of losses. 3. Catastrophic risks, for instance flood, drought or disease outbreaks are infrequent, but cause great damage to many farmers. The significant uncertainties associated with these events and the possibility of substantial losses makes it difficult to find market solutions, and there is a good chance of market failure. One bad year may cause crucial problems for next year investments, Mishra (1963).

Far mars Approach to risk management: Knowing the relative low-income level of our producers and the escalating, rigid input cost structure, the marketing initiatives and the price regulation devices could be the most flexible and effective tools in limiting the risk. As our production units are characterized by small size and shortage of capital, they are m ore sensitive to leverage effects of the risks. Fruit, vegetable, and flower producers need solid information and effective tools to cope with the increased production and marketing risks in present times. Increasingly, farmers are now looking at a deliberate and knowledgeable approach to risk management and want to learn, risk management means farming with confidence and assurance that their expectation earn profit from the production will come true. Also, it provides ability to deal with risks that come with new, attractive farming opportunities like floriculture in greenhouse, growing medicinal and aromatic plants, and cultivation of new crops like strawberry. Today business opportunities in horticulture have increased considerably, but so have the risks.

According to Hilldrith (1957) and Kahlon & Johl (1963) some of the more important changes affecting producer's risks are noted below:-

- **A changing government role**: Increasingly, government policy makers are placing greater confidence in the ability of producers to make sound business decisions. They have passed market-oriented farm legislation and crop insurance reforms that allow producers to be more active in managing their profit opportunities and risks.
- **Outside forces:** Many factors are forcing producers to make risky, but potentially profitable, decisions regarding their businesses. These factors include increased global competition, rapid changes in the structure of production agriculture, changes in the marketing of agricultural products in the farm supply sector, new technology, and more volatile weather patterns.
- **Risk Connections:** Increasingly, decisions in certain risk areas are affecting the riskiness and profitability of other aspects or farming. For instance, more lenders are now requiring sound business plans before approving credit. Thus, good management of marketing risks can lower borrowing costs and result in long-run financial stability. As farmers become more aware of the many such connection between their risks, the need for effective risk management will increase.

Setting Up risk Management Goals:

Risk management is driven by the goals you set for production. Better understanding of the risk leads to finding a better solution for its management. In general, horticultural production is most often a family business. All members of the family must share some common approach towards mitigating the risk. Everyone of the family should be involved in goal-setting process to manage the risk. After all, a family business cannot be successful if it does not help fulfill the individual aspirations. This can be achieved only w hen the business is free from the risks as far as possible.

Many times, the hardest thing about setting risk management goals is reconciling different views about risk. People have different answers for the same fundamental questions. What are our risks? What is an acceptable level of risk? What should we do about the risks? Recognizing and acting on opportunities as well as trying to minimize losses can help shape agreement on fundamental risk management goals, Johl and Kapoor (2012).

According to Mishra (1963) Kahlon and Johl (1963) and are benefits of setting risk management goals are as below:

- **Reflects your values, interests, resources, and capabilities:**

An honest goal-setting session for yourself, your family, and your business will cause you to take inventory of those things.

- **Provides a basis for your decisions and a focal point for everyone involved:**

Well- understood organizational goals allow every individual in the organization to set realistic personal goals.

- **Establishes priorities for the allocation of scarce resources:**

What things will you do today and what things will you do the future? For example, what priorities have you established for using net farm income? Buy land, pay for college, pay down debt?

- **Provides a means or measuring Progress:**

Which decisions made progress toward your goals and which decisions need to be re-evaluated? Any risk must be evaluated for its frequency of occurrence and its possible negative consequences. As a general rule, formal insurance strategies are available for risks with low occurrences but with severe negative consequences. As a general rule, formal insurance strategies are available for risks with low occurrences but with severe n negative consequences.

There are five kinds of risk involved in horticultural production: Production risks; marketing risks; financial risks; legal risks; and people risks (otherwise known as “human resources risks”). Of course, all of these types of risk are interrelated. Understanding the nature of these risks is a first step toward managing them. Global competition, World trade agreements, a shrinking number of buyers, the loss of local processing facilities, low prices, and reduced profits all contribute to increased financial vulnerability for the farmers and ranchers.

1. Production risks

Horticultural production implies an expected outcome or yield of any horticultural crop. Variability in outcomes from those that are expected poses risks to your ability to achieve financial goals. The major sources of production risks are weather, pests, diseased, the interaction of technology with other farm and management characteristics, generics, machinery efficiency or its failure, and the quality of inputs. Producers often come across an extremely difficult or bewildering situation like heavy premature fruit drop, poor fruit setting or complete unfruitfulness in perennial crops like mango, litchi, aonla, jackfruit, and vegetables like cucurbits, tomato or brinjal. Like any other crop all horticultural crops do suffer from insect pests and disease during their production cycle. Failure to adopt proper control measures can pose a serious problem of crop loss. Following are some risk management strategies you can consider to lower down the productions risks:-

- **Enterprise diversification**: Diversification is an effective way of reducing income variability. It is the combining of different production processes. For instance, diversification can include different crops, combinations of crops and livestock, different end points in the same production process (such as different selling weights), or different types of the same crop (such as yellow, green, red, or variegated bell paper; cream or pink fleshed sweet potato; white or red fleshed guava; yellow or red fleshed papaya). Small farmers can minimize production or income generation risk through diversifying source of income such as opting for part-time off-farm employment.
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Concerning the risk management tools, the production responses were used to the higher extent. In accordance with our expectation diversifying activities-growing several types of plants is the most important in risk protection. Effective diversification occurs when low income from one enterprise is simultaneously offset by satisfactory or high incomes from other enterprises. It typically reduces large year-to-year variations in income. However, diversification is becoming increasingly costly, as capital investment requirements become greater. Diversification can ensure adequate cash flow for meeting production costs, debt obligations, and family living needs.

- **Crop insurance**: Crop insurance schemes are of immense help to farmers, providing them with financial security against losses suffered by them with financial security against losses suffered by them due to crop failure because of fire & lightning, storm, cyclone, hailstorm, typhoon, tempest, hurricane, tornado. Flood, inundation and landslide, drought, dry spells, insect pests/ diseases so as to restore their creditworthiness for the ensuing season. Management of yield or price risk through the purchase of crop insurance transfers risk from you to others for a price which is stated as an insurance premium. Crop insurance is an example of a risk management tool that not only protects against losses but also offers the opportunity for more consistent gains. When used with a sound marketing program, crop insurance can stabilize revenues and potentially increase average annual profits. Insurance program protects against yield shortfall by providing coverage against most natural disasters. The level of protection can be selected as a percentage of your historic yield, Ray (2011).

- **Setting of indemnity and premium:** In standard traditional insurance, the basic issue to be addressed is whether the insurance is meant to substitute for farm income in the event of a loss event, or whether the indemnity would merely cover the cost of inputs lost, because of crop damage. The second option is certainly the easier and lower cost alternative, as the level of overall coverage would be significantly less.

- **Contract production:** Contract production is normally associated with vertical integration, where an agribusiness firm coordinates all aspects of a producer from protection to the consumer's table. Contract production is more common in fruit production. The orchards are sold to pre-harvest contractors for one crop season 2-3 season. Through production contracts, the contractor commits the landowner to deliver a fixed sum at a time or in phased manner. The contractors take the responsibility of orchard care, required management practices, and manage yield risk with suitable plant protection measures. Before you agree to a production contract, you need to consider the major trade-offs. A major advantage for the producer is that a market for the output and, very often, a favorable price are guaranteed.

- **Evaluating New Technologies:** The challenge of evaluating new technologies bears the risk of lover productivity, poor quality or even crop failure. For instance, some genetically altered vegetable seeds may fail to set fruits throughout crop cycle and push only luxuriant vegetative growth. Likewise the new variety being tested may fail to provide resistance to diseases or insects as promised by the seed agency. One must compare each aspect of the new technology with the current technology to determine the desirability of adoption. For example, costs and benefits for okra seed that is resistant to the yellow vein mosaic needs to be evaluated critically.

- **Precision farming:** controls the rate of application of crop inputs such as seed, fertilizer, and pesticides on each acre of a field. By contrast, the conventional approach applies the same rate across an entire field. Precision farming allows yields to be measured for each acre so that output can be strictly measured against crop inputs. As with all new technologies, farmers who adopt these new innovations try to capture a range of potential benefits, including lower input costs and environmental quality. Benefits can include higher crop yields due to improved pest control and more cost-effective use of crop inputs.

2. Marketing Risks:

Marketing is that part of the business that transforms production activities into financial success. Unanticipated forces, such as weather or government action, can lead to dramatic changes in crop prices. As agriculture moves towards a more global market, these forces stem increasingly from world factors. Other farmers, weather and other governments can affect your prices. When these forces are understood, they can become important considerations for the skilled marketer.

To be successful, you should take an informed and balanced approach to making marketing decisions. Focus on long-term profitability, not short-term windfalls. Academic studies indicate that marketing strategies that depend on price chasing or speculation have not been shown to be consistently profitable. Also, those strategies that do not consider financial and production risks will likely prove to be poor.

- **Personal Considerations in Marketing:** Marketing agricultural products involves information, objectivity, attitude, and skill. You should develop marketing plans and strategies that work for you. Inability to control market forces and difficulty in predicting those forces and difficulty in predicting those forces make marketing an inexact science. A better understanding of you financial situation and the possible consequences of your decisions will remove some of the uncertainty from marketing decisions. Obviously, marketing involves a good understanding of your current financial position.

Successful marketers are continually updating their abilities by learning new skills. Such efforts should be undertaken without the expectation of an immediate payoff. There are many professional who can help you. These include futures brokers, elevator operators, financial planners, and farm consultants, marketing decisions should not be made independent of other farm business decisions. They should be planned according to the impact they will have on the production, financial, legal, and human resource aspects of your business. Marketing decisions often involve contractual agreements that have important legal consequences. These contracts can significantly affect financial plans.

- **Developing a Marketing Plan:** Managing marketing risk begins with a marketing plan. The goals and objectives of your business should drive the marketing plan. An accurate understanding of production costs is a critical part of a sound marketing plan for you and the professionals who work with you. There may be times when the market price fails to cover all of the costs associated as an important reference, even though it is not usually not your desired price.

An analysis of supply and demand is important in developing targets for your marketing plan. Supply and demand projections are published by the Department of Agriculture and also by some private firms. Early in the growing season, expectations are highly uncertain. However, commodity markets respond decisively to these projections, so you should be aware of them. you should also be aware of prices received in your area and know the average prices received in previous years. Again, you have a choice of learning these skills and monitoring this information yourself, of hiring a professional to help you

Financial considerations such as cash flow requirements, including family living needs, should be incorporated in your marketing plan. Financial circumstances and other personal factors help determine your ability and willingness to tolerate market risks. Marketing plans should be as unique as the financial, production, and management characteristics of each individual producer. What works well for a neighbor may not be appropriate for you and your family. Unfortunately, letting emotions rule is easy when prices are moving. When prices rise, it is hard to resist trying to squeeze an extra few rupees from the market. And, it is easy to panic when prices fall. Contingency plans, as part of the basic marketing plan, will help. What to do if the price doesn "t reach the desired level and what to do if the crop is not as large as expected are important contingency actions when the market does not develop according to your general expectations.

- **Marketing Tools:** Learning about the full range of price risk management tools will allow you to become a better marketer and risk manager. Selecting the right tool to use at the right time will not only reduce risk, it could increase your profit. Following are a basic overview of more commonly used pricing strategies and guidelines for determining when to use each

Storage: Storage is a way if avoiding seasonally low prices. When prices are below the level anticipated in the marketing plan, storage may be justified, assuming that you have adequate financial resources. Storage may be warranted when there is a realistic expectation of a market price increase. Unfortunately, majority of horticultural crops are difficult to store for long as cereals or pulses. if is fast and it is always desirable to sell the commodity as early as possible to avoid loss of freshness and reduction in quality.

Direct Sale: When prices are favorable and at levels anticipated in the marketing plan, direct cash sale is warranted. For some producers, selling directly to final consumers is a way to enhance profitability and reduce risk. Smaller farms may especially benefit from direct sales for local or nearby markets. Examples include the sales of fruits and vegetables through roadside stands.

Minimum Price Contract: A minimum price contract establishes a floor price for the duration of the contract. The floor price is typically several cents below the cash price at the beginning of the contract. A than with a fixed-price contract if prices fall, but will benefit from a rise in market prices. This contract eliminates much downside price risk.

Put Option Purchase: This tool is similar to a minimum price contract. It sets a floor on the crop price throughout the life o the contract. If prices rise during the period, the seller can capture upside price gains.

Contracted Production: Many variations of this type of contractual arrangement exist. Historically, production contracts have been used for specialty horticultural crops. Purchasers have been willing to offer such contracts to fulfill the need for highly specific agricultural products. Contracted production may offer an increasingly broader range of crops. Contract production reduces flexibility. But, it assures a relatively reliable cash flow.

Marketing or Producers` Cooperatives: Forming and participating in marketing cooperatives provides members the opportunity to benefit from volume sales or purchases. Benefits may be in the form of enhanced prices received or reduced costs. There has been an increased interest in marketing cooperatives for horticultural crops. There are several crop specific producers` cooperatives in Maharashtra, Gujarat and other states that shoulder the responsibility of post harvest handling and marketing of the produce.

3. Financial Risk:

Financial risk has three basic components: (1) the cost and availability of debt capital, (2) the ability to meet cash-flow needs in a timely manner, and (3) the ability to maintain and grow equity. Cash flows are especially important because of the variety of ongoing farm obligations, such as cash input costs, cash lease payments, tax payments, debt repayment, and family living expenses. Your objective should be to manage this risk through sound planning and financial control. To do that, you should continually monitor your ability to bear financial risk.

- **Farm Records and Financial Analysis**

A set of well-maintained financial records is an absolute necessity to maintaining financial control of a farm. The flow of information is critical in evaluating past performance and in planning for future accomplishments; financial risk management is not achieved directly by maintaining comprehensive records. However, records do provide much of the information needed to understand critical financial risks. Essential financial statements include the balance sheet and statement of owner`s equity, income statement, and projected and actual cash flows. These records provide a history of your business and the data you need to calculate financial performance measures. Even small farms need a basic level of record keeping. As the size and complexity of an operation grow, so does the need for financial records. Ratios such as debt-to-asset, debt-to-equity, and turnover are important in monitoring overall financial performance. Other measures can be used to monitor the financial status of the business and provide guidelines for future decisions. These examine liquidity, solvency, profitability, financial efficiency, and repayment capacity of the business.

4. Interest Rate Risk:

Investment decisions are based on assumptions about future borrowing costs or the opportunity cost of invested funds. Borrowed capital can be a reasonable expense especially if you are prudent in the financial leveraging of your business. After all few operations are in a position to use only equity capital for new investments. Borrowing is a vital part of most farming business. Interest rate risk is mostly out of your control. However, you can sometimes influence your interest rate by lowering your debt-to-asset ratio and through the use of crop insurance coupled with a sound marketing plan. These actions by you reduce a lender`s risk exposure.

- **Liquidity and Meeting Cash Flow Requirements :**

Ensuring liquidity and adequate cash flow is the same as ensuring the farm`s ability to shortfalls in net income relative to various cash obligations. Assets classified as current on the balance sheet are assets that can be converted into cash within one operating cycle of the farm business, usually 12 months. Liquid assets in include instruments that yield cash directly or that can be converted quickly to cash. Liquid assets include instruments that yield cash directly or that can be converted quickly to cash. Liquid assets include cash on hand, supplies, and crops to be sold within the year. Adequate liquidity is essential to ensure a sufficient cash flow. Also, adequate liquid reserves can facilitate conditions. However, excess liquidity typically generates lower rates of return than fixed assets.

- **Family Living Costs :**

A significant component of financial risk is controlling and meeting family living costs. Reducing family living costs may not be feasible. But, careful scrutiny of your living costs should be an integral part of annual cash flow planning. In certain instances, off-farm employment can be a risk management strategy. It can ensure that living costs are met and can increase the family`s standard of living. it may also reduce the need to liquidate farm assets to meet family living needs.

5. Legal Risks:

Important legal issues are involved in borrowing. The legal language incorporated into loan contracts can be intimidating and puzzling. Nevertheless, you should have sound knowledge of the details and implications of all legal documents. You should seek the guidance of an attorney before you sign important documents. from a lender`s point of view, security and repayment capacity are essential. Liens, credit life insurance, and crop insurance coupled with a sound marketing plan can help to make a loan more secure in the eyes of the lender. From your perspective, you can ensure continued access to debt capital when you need it by maintaining accurate financial records and a consistent record of timely repayment of loans.

- **Legal Issues Associated with Horticulture :**

Many of the day-to-day activities of farmers involve commitments that have legal implications. Understanding these issues can lead to better risk management decisions. legal issues can cut across other risk areas. For example, acquiring an operating loan has legal implications if not repaid in the specified manner. Production activities involving the use of pesticides have legal implications if appropriate safety precautions are not taken. Marketing of agricultural products involves contract law. Human resource issues associated with agriculture also have legal implications, ranging from employer/employee rules and regulations to inheritance laws. The legal issues most commonly associated with agriculture fall into four broad categories: appropriate legal business structure and tax and estate planning, contractual arrangements, tort liability, and statutory compliance, including environmental issues.

- **Structural Issues :**

The first legal issue that many family farms encounter is the nature of the entity under which the business is to be operated. Often, through lack of attention, sole proprietorship is automatically chosen. However, alternatives exist including partnerships, limited partnerships, and corporations. Contractual arrangements in agriculture take many forms. A contract is any agreement (written or verbal) where the parties exchange mutual promises in return for some sort of consideration or benefit. Contracts include financial, such as promissory notes and mortgages. Leases and crop share arrangements are contracts. Sale of agricultural products is often accomplished by contracts for future performance. Crop insurance coverage is also based on a contractual agreement.

6. Environmental Risks:

Pollution laws are now a major concern for all including farmers. Farmers can greatly reduce their criminal liability exposure by formulating and following environmental audit procedures. Many good farmers fail to keep records necessary to prove compliance. Accurate records should be kept on the applications of herbicides, pesticides, and fertilizers. For a horticultural business, environmental assurance is a means of demonstrating the use of management practices that achieve the level of environmental protection expected of itself and its customers, the community and other interested parties. Horticultural producers usually have a fundamental interest and play pivotal role in protecting, and where necessary and practical, enhancing and restoring natural resources. Assuring the long term sustainability of horticultural businesses. However, there is not widespread uptake of an Environmental Management System (EMS) approach currently in the horticulture industry in the state.

7. Human Resources Issues:

Human resources are both a source of risk and an important part of the strategy for dealing with risk. At the core of dealing with that risk and that potential is your approach to managing people. Most families that successfully work together have evolved a good management system. Their flows from the inter dynamics of lifetimes spent together, of giving and taking, of listening to and respecting one another. But, even small family farms can benefit as much as large operations from clearly defining how plan and decisions are to be made for the business.

Risk management strategies are implemented through people engaged in the business. Every one`s job description should have explicit risk management duties and delegations of power and authority to manage. Risks is an important part of business planning and can give employees confidence in their own long-term future with the business establishment. Involving everyone, family and outside employees, in the goals of the organization. Workers who understand why and how decisions are made, and exactly, what their responsibilities are, will see opportunities for themselves inside the organization. Formalizing planning and reduce legal risk arising from employee relationships.

Human resource management is best viewed as a process. Seven functions that describe process are job analysis and job descriptions, hiring, orientation and training, employer/employee interaction, performance appraisal, compensation, and discipline. Hired labor is not the only component of your human resource team. Family, managers from outside the business, consultants, and external advisory sources can also be a part of your team. it is important that everyone on your management team understands your risk management tools. Human resource calamities can hamper even the most carefully made and appropriate risk management decisions. Those calamities include divorce, chronic illness, and accidental death. Your risk management plans should anticipate the likelihood of human resource calamities.

Summary:

The standard approach to risk management in horticultural production should be holistic. Your risk tolerance is reflected in the ways you understand the risks and choose tools to manage them. The risks associated with crop production and marketing of the farmer, who then determines a strategy to manage them. Policymakers also look at some particular risks inflicting large scale damage and their management strategies. For example, a risk such as price volatility would cause difficulties for the farmer, and with no future market available for the concerned commodities the government may decide to intervene by announcing a minimum support price. Nevertheless, agricultural risks ate not independent but linked to one another and are part of a system that includes all available instruments, strategies and policies designed to manage them. Using our example of price volatility, a price hike is possible due to severe drought or a price fall by unprecedented overproduction. The producer should ever be ready to manage all sorts of risks.

To manage in the event of price volatility, a farmer can use a variety of strategies in a holistic manner, such as crop insurance, off-farm work, savings or diversification and government intervention in policies on price fixation. A growing interest in agricultural risk management is encouraging the development of exciting about and using these tools, the farmers can build the confidence they need to deal with both the risks and the exciting opportunities of horticultural production in future.

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