

The Role of Insurance in Risk Management and Investment Promotion of Modern Agribusinesses (The Case of Greenhouse Cultivation in Tehran Province)

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Abstract

Insurance has always been an efficient tool in facilitating production and increasing investment through the world. Meanwhile, lack of investment has been a constant problem in the agricultural sector, as one of the most vulnerable economic sectors. Hence, insurance, as an effective tool for securing the return on investment, is likely to solve this problem. The current research is aimed at identifying and analyzing the role of insurance in risk management of modern agribusinesses. In order to fulfil the research objective, a mixed method research was designed and qualitative and quantitative tools were developed. In the qualitative part, the research population includes the experts of agriculture and investment in new businesses, while the population of the quantitative part is composed of greenhouse owners in Tehran province. 9 interviews were carried out in the qualitative part and data were analyzed through open and axial coding. In addition, 137 questionnaires were investigated in the quantitative part. Quantitative data were analyzed by structural equation modelling method. The results demonstrate that various types of risk, including production, market, and environmental risks have a negative effect on the insurance rate, In other words, insurance coverage decreases when risk increases, which is a rational result. Moreover, insurance has a positive effect on investment promotion and can offset the negative effect of risk and lead to an increase in investment and hence, establishment of new businesses in this field.

Keywords: Insurance, risk management, investment promotion, modern agribusinesses.

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Introduction

Providing food security, fulfilling the essential needs of the industrial sector, and creating employment opportunities are among the particular elements that have given rise to the significance of agriculture as one of the main economic sectors. Despite the importance of the agricultural sector in the country's economy, activity and investment in this sector is different from other production and economic activities (Bingswanger, 1980; Anderson Foilion, 1992).

Risk management can enable the establishment and expansion of modern businesses in the agricultural sector. The objective of risk management is to mitigate the risks that will create obstacles in the way of production. Researchers have considered various strategies for risk management. For instance, (1) risk avoidance, (2) risk mitigation, (3) insurance, and (4) risk retention are among the most important risk management strategies. Insurance can be considered as one of the main risk sharing strategies.

Due to the low level of investment in the agricultural sector in spite of its importance in the country's economy, and the role of insurance as one of the facilitating institutions for investment and the establishment of agribusinesses, the current research seeks to explore the role of insurance in risk management and investment promotion of agribusinesses.

Literature review

Risk management is one of the main elements of agriculture, such that the statesmen consider it as one of the objectives of agricultural sector policies. Risk management entails choosing among the existing alternatives in order to reduce the effects of risk. This requires a true understanding of risk that enables effective management during the loss occurrence, assessment of incidents and the interactions among risk changes, expected incomes, entrepreneurial freedoms, and other variables.

Understanding some issues is essential to risk management: (1) risk event(s), (2) risk exposure, and (3) the cause of risk. In these situations, the risk mitigation strategies that can be employed include: (a) risk acceptance, (b) avoidance or elimination of risk, (c) risk transfer to another party, or (d) risk control. A risk that is not well identified and/or properly assessed hinders an investment opportunity and is considered a weakness in investment in the agricultural sector (Miller, 2008).

In order to develop agricultural risk management frameworks in the national level, Agricultural Risk Management Team (ARMT) provides technical assistance and capacity building services for customers. ARMT's approach to the development of risk management frameworks, typically involves the following sequence (World Bank, 2013):

- **Risks assessment and prioritization:** It is comprised of analysis of the major agricultural risks and their prioritization, based on probability of occurrence and severity of losses.

- **Market Risks:** Risks such as commodity and input price volatility, exchange rate and interest rate volatility, counterparty/default risks are usually categorized in the market level. However, they have backward linkages to the farm gate, thereby affecting all stakeholders and shareholders.
- **Enabling Environment Risk:** Changes in government or business regulations, macro-economic environment, political risks, conflicts, trade restrictions, etc. are major enabling environment risks that lead to financial losses.

Adoption of agricultural risk management frameworks by client countries could lead to high resilience and reduced vulnerability of the agricultural sector. ARMT helps client countries develop such frameworks through its technical assistance activities, which will result in the following concrete outcomes:

- Overall analysis that identify the main risks and solutions, including the roles of different stakeholders in risk management.
- List of investments, technical assistance, and policy issues required to implement the framework.
- Filtering mechanisms to help prioritize interventions.
- Institutional framework (developed with a client) to operationalize the risk management strategy.

Based on the investigation of previous research, the following elements can develop or hinder the greenhouse units.

Socio-cultural factors: appropriate cultural contexts (Hall, 2003), consumption culture (Hall, 2003; Satari Far, 2006), economical conditions and people's purchasing power, customs, inappropriate financial foundations (Koupahi, 1994; Satari Far, 2006), aspiration for economic progress and capital investment, cooperation spirit.

Infrastructural factors: weather and climate, the geographical location of the place, land size and direction, road system and transportation, backup services and power supply networks (water, electricity, and fuel) (Barzegar and Allahyari, 2005), information reception systems.

Management and human resource factors: the manager or owner's level of education and expertise (Safely and Hall, 2003), the method of workforce selection and recruitment, general training and awareness of the specialized issues of the greenhouse industry workforce, the market of products, inputs, and information resources alongside having accounting and auditing systems, cost and revenue management, leadership ability (Brom Fild, 2003), success factors including goal, plan, faith, and resilience.

Production technology factors: pest control, structural standards, heating and cooling systems, type of structure (Heravi, 2005), greenhouse covering, ventilation system, control systems, irrigation systems, type of harvest, harvest system, light and carbon dioxide adjustment system (Brom Fild, 2003).

Economic factors: existence of consumption and demand market (Koupahi, 1994; Hall, 2003), investment funding, economic motivations, funding resources, establishment costs, installments and payback period, variable and current costs, sales price and production risk.

Regulations and governmental support factors: factors related to commercial and market issues, consumer characteristics, existence of consumption and demand market for the product, diversity and quality of the product, planning for responding to the needs of consumers, harvest, maintenance, and supply systems, transportation and distribution systems, promotion, sales management and pricing, distance from the sales and consumption market, production input supply market (Esna Ashari, Harikiess, and Zokayi Khosroshahi, 2008; Safely, 2003; Hall, 2003).

According to Ortmann and Colleges (1995), the risk production sources include government policies, revenue fluctuations, access to credit, public rules and regulations, and cost fluctuations. They also introduce marketing, insurance, financial, cost reduction, and life assurance strategies as risk management strategies in their study.

Research method

The current research is a descriptive study conducted through survey method, examining the correlations. It is considered applied, regarding its objective and its data collection method is survey. Moreover, the research data are mixed. In order to examine the issue of the current research, measurement tools (interview and questionnaire) were designed and qualitative and quantitative variables were observed. Since the objective of the research was to identify and analyze the role of insurance in risk management and investment promotion of agribusinesses, in the greenhouse cultivation case in Tehran province, structural equation modeling was used which is a correlation method for descriptive (non-experimental) research.

According to the World Bank model (2013; Figure 1), the research variables included *investment promotion* as a dependant variable; *risk transfer strategies*, as a dependant variable in one level and an independent variable affecting investment promotion in another level; and also *types of risk*, *stakeholders*, and *investment instruments*, as independent variables in one level and dependant variables in the second level.

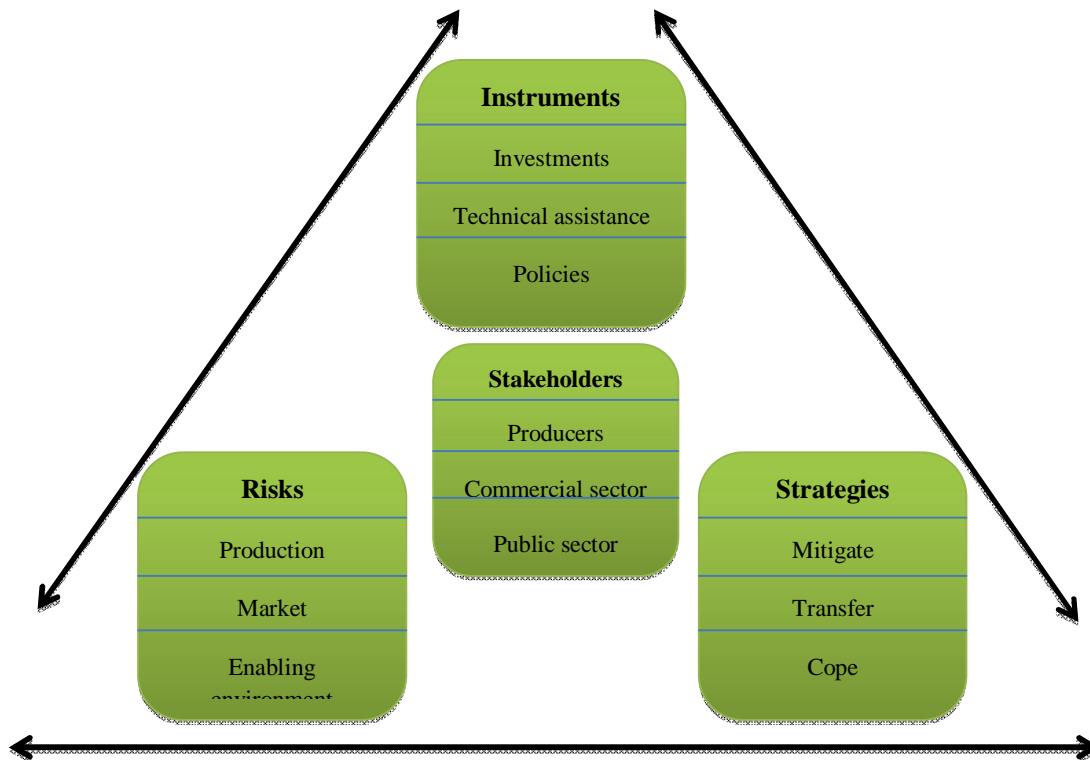


Figure 1: Agricultural sector risk management (World Bank, 2013)

Based on these variables, the research hypotheses are as follows:

- H1: There is a significant relation between risk and investment instruments.
- H2: There is a significant relation between types of risk and stakeholders.
- H3: There is a significant relation between types of risk and insurance.
- H4: There is a significant relation between investment instruments and insurance.
- H5: There is a significant relation between stakeholders and insurance.
- H6: There is a significant relation between types of risk and investment promotion.
- H7: There is a significant relation between insurance and investment promotion.

Results

In the qualitative part, the data became repetitive after 9 interviews were conducted. Hence, based on data adequacy rationale, the researcher considered the sample size as adequate. The extracted statements, and their categorization into open axial codes is demonstrated in Table 1.

Table 1: Coding of the interviews

Axial codes	Open codes	Statements
Instruments	Investment	Long payback period
		Bank loans' interest rates
		Market instability and intense fluctuations in the prices of greenhouse products
		External investment
		Familiarity of farmers with investment science
		Insurance solutions for unanticipated risks in the primary phases of business
	Technical assistance	Information provision, consultation, and agricultural technical and engineering services by insurance companies
		Provision of high-quality inputs (seeds, etc.) by related institutions
		Consultation and provision of effective solutions for marketing and sales of greenhouse products by Agriculture Jihad Office of the province
		Transfer of new scientific agricultural findings to greenhouse owners
		Diversification of cultivated greenhouse products
	Policies	Creating agricultural infrastructures and associations and facilitating the greenhouse construction process
		Developing greenhouse towns in Tehran suburbs
		Expanding the modern agriculture research and development sector for by agricultural sector authorities
		Financial support during the occurrence of incidents and losses by related institutions
Avoiding the influence of mediators by agricultural sector authorities		
Stakeholders	Producers	Decrease in people's purchasing power and rise in greenhouse product prices
		Greenhouse product quality
		Organicality or healthiness of greenhouse products
		Genetic manipulation of greenhouse products
		Lack of appropriate packaging of greenhouse products
		Easy and quick access to greenhouse products
	Commercial sector	Customers' freedom to choose
		Low influence of the private sector
		Apathy or reluctance to invest in agricultural activities Transparency of the related rules and supporting the investors

		Robust agribusiness organizations and strong supply chain
		Authorities' decision making method in agricultural sector
	Public sector	Inefficiency and low degree of technical knowledge in the public sector
		Developing the information and IT network
		Traditional approach to greenhouse business activities
		High costs (wage, production) and long production processes
		Weakness in establishing agricultural infrastructures and land aggregation by agricultural sector authorities
Strategies (insurance)		Risk mitigation
	Using reinsurance and cooperation of agriculture insurance fund with big insurance companies	
	Creating opportunities in the agricultural sector for creating modern businesses	
	Utilization of modern technologies, such as ICT, GIS, and RS in agricultural insurance process and standardization of loss assessment	
	Repair and retrofitting of greenhouse structures	
	Improvement of the efficiency of insurance services for agricultural products and greenhouse structures	
	Risk transfer	High risk factor and the probability of loss occurrence in agricultural activities and reluctance of insurance companies to underwrite
		Limited financial resources for development of underwriting operations
		Issuing wholesale insurance in Agri Bank branches
		Public subsidy targeting in agricultural product insurance
	Risk coping	Adaptation to the business conditions and attention to the previous agricultural insurance policy terms (insurance backgrounds)
		The quality of social insurance services for greenhouse owners
Precautionary savings that can be used in case of necessity		
Risk	Production risk	High cost of business setup (end price, mechanization of traditional structures)
		Small-scale production
		High energy use in traditional structures of greenhouses

		Easy access to resources and markets
		Coordination of agricultural knowledge and production
	Market risk	Strong sales chain and modern marketing
		Legal support for sales contracts of greenhouse products
		Strong and appropriate transportation system
		Long-term sales contracts due to market fluctuations and installment sales
		Seasonal production and pricing of greenhouse products
		Inefficiency of supportive rules and tax exemptions
	Environmental risk	Laws supporting export and the existence of sanctions
		Public nature of the agricultural sector management and oldness of the related insurance regulations
		Codified planning for harvest based on regional need
		Development of agricultural infrastructures
		Stability of internal economic environment
		Climatic (cold, heat, humidity) and environmental (quality of irrigation water, soil, etc.) factors

Structural equation modeling is applied in the quantitative part of the research and includes three phases. First, the technical specifications of the model were examined and exploratory factor analysis was conducted. In the second phase, the model's parameters were estimated. Moreover, the structural part of the model was analyzed and the model's fitness test was conducted. Herein, only the technical specifications of the model and its structural part are provided due to the lack of space.

The quality of the model's parameters is analyzed from two different aspects:

- Reliability
- Convergent validity

In order to measure the reliability, composite reliability (composite reliability greater than 0.7) and Cronbach's alpha (Cronbach's alpha greater than 0.7) coefficients are utilized. If these coefficients meet the standards, the questionnaire can be considered reliable. Average Variance Extracted (AVE) index is used for estimating the convergent validity. The minimum accepted level of AVE is 0.5 (Adcock and Collier, 2001). Table 2 demonstrates the AVE, composite reliability, and Cronbach's alpha coefficients.

Table 2: Coefficients of the extracted variance mean, composite reliability, and Cronbach's alpha

Variable	AVE	Composite Reliability	Cronbach's Alpha
Producer	0.93	0.99	0.85
Risk coping	0.87	0.88	0.76
Environmental risk	0.87	0.76	0.85
Public sector	0.69	0.74	0.87
Investments	0.7	0.89	0.91
Investment	0.87	0.91	0.82
Investment promotion	0.91	0.77	0.86
Market risk	0.89	0.98	0.82
Risk mitigation	0.88	0.89	0.91
Production risk	0.95	0.99	0.78
Risk	0.69	0.97	0.92
Stakeholders	0.65	0.97	0.91
Insurance	0.98	0.99	0.94
Technical assistance	0.91	0.89	0.87
Commercial sector	0.76	0.94	0.70
Risk transfer	0.83	0.85	0.76
Policies	0.79	0.75	0.86

As it is evident in Table 2, all variables are highly reliable in the model. The composite reliability of the variables is higher than 0.7. Besides, the Cronbach's alpha coefficient is higher than 0.7 for all variables. The convergent validity is also higher than 0.5.

Next, the result of the relation between the latent variables is discussed in table 3..

Regarding the relations between the structural aspects of the model, first the relations of agricultural risk management were examined. In the second phase, the relation between types of risk in the agricultural sector and also the strategies for coping with them through investment promotion were studied. The results show that in the risk management part, the relation between types of agricultural risks and investments is equal to 0.95. Also, the relation between types of risk and stakeholders equals 0.97, which is confirmed in 95% level of confidence. The relation between stakeholders and insurance is 1.5. This relation is also accepted, since the T is greater than 1.96. The relation between investments and insurance is also 0.68 which is accepted in 95% level of confidence. Finally, the relation between types of risk and insurance is -1.3, which shows a negative relation between risk and insurance. In other words, insurance coverage decreases when risk increases, which is a rational result.

Table 3: Significance of variables and path coefficients

Path	Path Coefficient	Standard Deviation	T
Investment ... Investments	0.79	0.07	10.75
Investments ... Insurance	0.68	0.19	2.8
Technical assistance ... Investments	0.83	0.04	22.65
Policies ... Investments	0.92	0.01	62.53
Environmental risk ... Risk	0.94	0.01	84.45
Risk ... Investments	0.97	0.01	112.05
Risk ... Investment promotion	-0.44	0.16	2.71
Market risk ... Risk	0.90	0.02	38.12
Production risk ... Risk	0.78	0.06	13.50
Risk ... Stakeholders	0.98	0.01	165.35
Producers ... Stakeholders	0.90	0.03	35.98
Public sector ... Stakeholders	0.85	0.03	24.84
Stakeholders ... Strategies	0.79	0.19	4.20
Commercial sector ... Stakeholders	0.85	0.03	24.74
Coping ... Insurance	0.93	0.01	64.98
Mitigation ... Insurance	0.95	0.02	58.34
Transfer ... Insurance	0.98	0.00	242.94
Risk ... Insurance	-1.3	0.08	1.961
Insurance ... Investment development	0.32	0.17	2.76

In the second part the relations of types of risk and insurance with investment promotion are examined. The results reveal that these relations are confirmed in 95% level of confidence. The relation between insurance and investment promotion is 0.32, confirmed in 95% level of confidence. In addition, the relation between risk and investment promotion is 0.95 which is confirmed in 95% level of confidence.

According to Tenenhaus et al. (2005), the model fit criterion in PLS can be calculated via the following formula:

$$GOF = \sqrt{\text{communality} \times \bar{R}^2}$$

$$GOF = \sqrt{0.92 \times 0.74} = 0.82$$

Since the minimum accepted level of measurement of this criterion is 0.36 (Akin, Bloemhof-Ruwaard, and Wynstra, 2009) and the amount calculated for this criterion equals 0.82, the model can be said to have a good fit.

Discussion

- H1: There is a significant relation between risk and investment instruments.

The research findings, show a significant, positive relationship between risk and investment instruments.

Thus, it can be concluded that an increase in the types of risk in the greenhouse cultivation field, leads to an increased need for investment instruments such as allocating financial resources to irrigation infrastructures, pest-resistant crops, improvement of greenhouse structures, climatic infrastructures or investment in improvement systems, improvement of greenhouse structures.

- H2: There is a significant relation between types of risk and stakeholders.

The research findings confirm a significant, positive relation between risk and stakeholders.

This finding shows that an increase in the types of risk will lead to an increased need for regulation of the relationships among stakeholders. On the other hand, the stakeholders in the production field will suffer losses with a decrease of people's purchasing power and rise in the prices of greenhouse products and will need more support in pricing. Moreover, the nonexistence of effective commercial institutions for greenhouse cultivation and lack of support for production processing such as appropriate packaging of the greenhouse products, easy and quick access to greenhouse products, and low level of private sector influence need to increase. Finally, regarding the public sector stakeholder, it must be noted that lack of transparency of the rules and adequate support for investors, decision making method of the authorities in the agricultural context, inefficiency and low level of technical knowledge in the public sector, and unexpanded information and IT networks require thorough investigations.

- H3: There is a significant relation between types of risk and insurance.

The research findings show a significant, negative relation between risk and insurance.

According to the obtained results, it can be concluded that rationally any increase in the types of risk in the greenhouse cultivation sector will reduce the level of insurance, which will occur through risk mitigation, transfer, or coping.

- H4: There is a significant relation between investment instruments and insurance.

The research findings confirm a positive, significant between investment instruments and insurance.

According to the results of the fourth hypothesis, increase in the amount of investing activities in greenhouse cultivation will lead to growth in the level of insurance coverage. Improvement of consulting institutions and allocating resources in this field, along with improvement of policies in this sector could increase the confidence level of insurance institutes for decreasing the inappropriate choices.

- H5: There is a significant relation between stakeholders and insurance.

The research findings confirm a significant, positive relation between stakeholders and insurance.

The results of the fifth hypothesis imply that higher level of stakeholders' management will lead to an increase in the insurance coverage. In fact, greater pricing support in the production stakeholders' sector, establishing effective commercial institutions for greenhouse cultivation, supporting the product processing such as appropriate packaging of the greenhouse products, easy and quick access to greenhouse products, and increase of private sector influence in the commercial stakeholders' part will lead to increase of insurance coverage.

- H6: There is a significant relation between types of risk and investment promotion.

The research findings demonstrate a significant, revers relation between risk and investment promotion.

According to the obtained results, it can be concluded that increase in the types of risk will grow the need to invest in greenhouse cultivation field. Therefore, type of risk is a variable negatively affecting the level of investment promotion. Risk increase will lead people to seek coping methods which require investment and allocation of financial and technological resources.

- H7: There is a significant relation between insurance and investment promotion.

The research findings confirm a significant, positive relation between insurance and investment promotion.

Thus, logically, increase in the insurance coverage will give rise to investment, as the research findings prove. Increase of types of insurance and reinsurance coverage in order to mitigate, transfer or cope with the risks will lead to investment promotion.

Conclusion

The studies on the productivity of using agricultural inputs conducted in Iran, display unused capacities in this sector (Torkamani and Hardaker, 1996; Torkamani, 2000). One of the major reasons for this problem is the immaturity and low level of investment in this sector, which is due to various factors such as the weakness of political and economic power of the agents of this sector, late-return of agricultural plans and natural resources, high investment risk of the private sector, and to some extent, supportive policy tendencies towards urban consumers. Exploring the effective dimensions of risk management and investment promotion through insurance in the research literature reveal that the framework provided by the World Bank can be employed as a universal conceptual pattern focused on the role of insurance in risk management.

In the present research, insurance is considered as the main strategy for developing modern agribusinesses. In between the natural risk and catastrophic risk layers, are the risks that can be supplied in the market and can be managed through the insurance mechanism. According to the results of the data analysis and the relations discovered

among various components of this framework, it can be claimed that investment promotion could be obtained through the promotion and improvement of insurance sector, expansion of a cooperative insurance approach, and targeting the taxes and subsidies of the agricultural sectors.

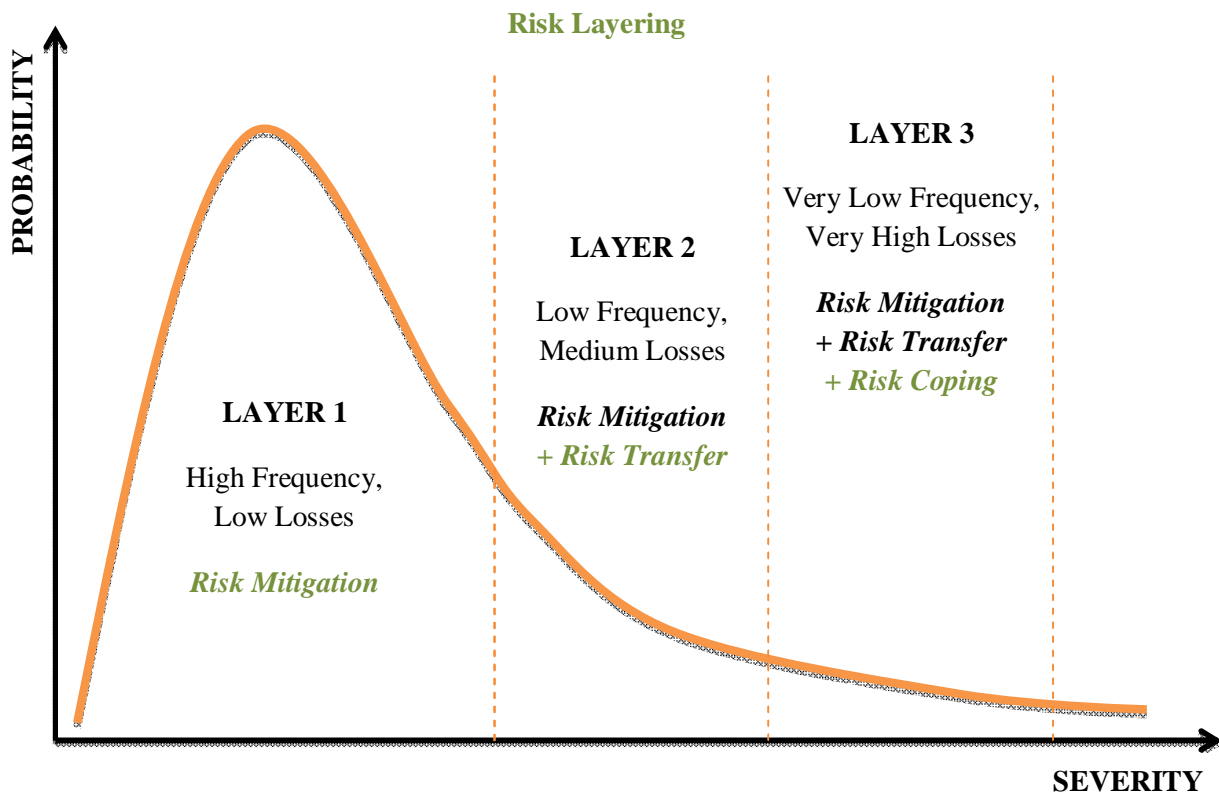


Figure 3: Different risk layers (World Bank, 2013)

For this purpose, the first risk layer which is normally of a high frequency and low severity can be covered by the farmers themselves, through a cooperative agricultural insurance fund. It can yield the wide cooperation of farmers; motivate innovations in risk management and controlling unanticipated incidents, in addition to reducing the moral risks. The second layer, which includes the risks that can be supplied in the market, would obtain reinsurance coverage through the participation of the private sector and insurance companies, which avoids inappropriate choices and adverse selection by insurance companies and increases their willingness to enter the insurance market of agricultural products. The third layer includes risks with low frequency, but very high severity, which are catastrophic and covered by governmental supports and public sectors. They can completely target the subsidy allocation process and optimize the government payments in the market surplus layer and can create a confident environment for private sector investors for entrance to the market and the development of agribusinesses and consequently, greenhouses through management and control of risk in different layers and appropriate funding during the loss occurrence by farmers cooperative insurance fund.

References

- Agricultural Risk Management- Agricultural Sector Risk Management (2013). The World Bank.
- Amini, F. (1998). Assessment of Investment Situation in Iran's Agricultural Sector (in Persian). *The Journal of Planning and Budgeting*, 33: 95-119.
- Aziz Nasiri, S. (2011). Weather-Based Crop Insurance as a Viable Instrument for Managing Agricultural Risks (in Persian). Masters' Dissertation. Allameh Tabataba'i University, ECO College of Insurance.
- Barham, J. and Chitemi, C. (2009). Collective action initiatives to improve marketing performance: lessons from farmer groups in Tanzania. *Food Policy* 34(2009): 53–59.
- Barrett, C. (2008) Smallholder market participation: Concepts and evidence from eastern and southern Africa. *Food Policy* 33(2008): 299-317
- Barton, Su. (2003). Enhancing profitability greenhouse through improved personnel management. University of Delaware press.
- Birchall, J. (2003). Rediscovering the co-operative advantage: poverty reduction through self-help. Geneva, Switzerland: International Labour Organisation.
- Brom Fild, R. (2003). Enhancing Greenhouse profitability through improved Equipment purchasing. University of Rutgers press.
- Bruynis, C., Goldsmith, P.D., Hahn, D.E., and Taylor, W.J. (2001). Critical success factors for emerging agricultural marketing cooperatives. *Journal of Cooperation* 16(2001): 14-24.
- Campbell, T.S., and Kracaw, W.A. (1993). *Financial risk Management* Harper Collins College Pub. 220 p.
- Cooper, D. R. & Schindler, S. P. (2003). *Business research methods*, (8th Ed). McGraw.
- Esna Ashari. M. & Zokayi Khosroshahi, M. (2008). *Physiology and technology post harvest*. AbualiSina university press. vol. 298. (1th Ed). (In Farsi)
- Food and Agriculture Organization. (2004). *Greenhouse plants statistics*. Jihad agriculture ministry. Tehran Retrieved from: www.fao.org .(In Farsi)
- Fulton, M.E. and Gibbings, J. (2000) *Response and adaptation: Canadian agricultural co-operatives in the 21st century*. Ottawa: Canadian co-operative association and Le conseil Canadien de la cooperation.
- Golovina, S. and Nilsson, J. (2009) Difficulties for the development of agricultural cooperatives in Russia: the case of the Kurgan region. *Journal of Rural Cooperation* 37(1): 52-70.

Gray, T.W. and Kraenzle, C.A. (1998) Member participation in agricultural cooperatives: a regression and scale analysis. RBS Research Report 165. Washington, DC: USDA, Rural Business Cooperative Service.

Hakelius K. (1996) Cooperative values: farmers' cooperatives in the minds of the farmers. PhD thesis, Swedish University of Agricultural Sciences, Uppsala, Sweden.

Hall, C. H. (2003). Issues affecting profitability of the nursery and greenhouse industry. university of Tennessee press.

Hansen, M.H., Morrow Jr., J.L. and Batista, J.C. (2002) The impact of trust on cooperative membership retention, performance, and satisfaction: an exploratory study. *International Food and Agribusiness Management Review* 5(2002): 41-59.

Harkiess, R. (2003). Enhancing greenhouse profitability through improved materials handling and distribution. University of Delaware press.

Harwood, J., Heifner, R., Coble, K., Perry, J., & Somwaru, A. (1999). *Managing Risk in Farming: Concepts, Research and Analysis*. Washington, DC: Market and Trade Economics Division and Resource Economics Division, Economic Research Service, U.S. Department of Agriculture.

Heravi, A. (2005). Study on establishment costs of cucumber greenhouse production. First congress, in: proceeding of study on greenhouse Cultivation problems and challenges. Management and planning organization of Esfahan province. Esfahan. (In Farsi)

Hobbs, J.E. (1997) Measuring the importance of transaction costs in cattle marketing. *American Journal of Agricultural Economics* 79, 4(1997): 1083–1095.

Hollaway C., Nicholson C., and Delgado C. (1999) Agroindustrialization through institutional innovation: Transaction costs, cooperatives and milk-market development in the Ethiopian Highlands, MSSD Discussion Paper No. 35, Washington D.C.: International Food and Policy Research Institute.

Iturrioz, R. (2009). *Agricultural Insurance*. Washington, DC 20433: The International Bank for Reconstruction and Development/The World Bank.

Karantininis, K. (2007). The network form of the cooperative organization –an illustration with the Danish pork industry. In: Karantininis, K. and Nilsson, J. (eds.) (2007) *Vertical markets and cooperative hierarchies: the role of cooperatives in the agri-food industry*. Springer.

Kerzner, H. (2003). *Project management: A system approach to planning, scheduling and controlling*. Wiley.

Kim, J. (2005). A Credit Risk Model for Agricultural Loan Portfolios under the New Basel Capital Accord. *Agricultural Economics*.

- Kleiber, C. and Zeileis, A. (2008) Applied econometrics with R. Springer.
- Koupahi, M. (1994). Economics agriculture principal. Tehran university press. (9th Ed). (In Farsi)
- Mahul, O. (2011). Agricultural Insurance. Retrieved from www.gfdrr.org/drfi.
- Markelova H., Meinzen-Dick R., Hellin J., and Dohrn S. (2009) Collective action for smallholder market access. Food Policy 34, 1–7.
- Miller, C. (2008). Risk Mitigation and Management for Agricultural Investment: Module: Investment and Resource Mobilization. FAO Policy Learning Programme.
- Nto, P. O., Mbanasor, J. A., & Nwaru, J. C. (2011). Analysis of risk among agribusiness enterprises investment in Abia State, Nigeria. Journal of Economics and International Finance, 187-194.
- OECD. (2009). Managing Risk in Agriculture: A Holistic Approach .
- Ortmann, G.F., Woodburn, M.R., and Levin, J.B. (1995). Dimensions of risk and managerial responses to risk on commercial farms in Kwazulu-Natal, South Africa. Pp: 661-675. 10th International farm management.
- Ozanne, A. (1999). Perverse Supply Response in Peasant Agriculture: A review. Oxford Development Studies 27(2): 251-270
- Pannell, D. J. (2003). Uncertainty and adoption of sustainable farming systems. Drench: Clawer Press.
- Poulton, C., Kydd J., and Doward A. (2006) Overcoming market constraints on pro-poor agricultural growth in Sub-Saharan Africa. Development Policy Review 24(2006): 243-277.
- Risk Management in Agriculture: What Role for Governments? (2011) Organization for Economic Cooperation and Development.
- Rutten, L. (2012). Innovative agricultural finance and risk management: Strengthening food production and trade in the transition region. Rome, Italy: prepared under the FAO/EBRD Cooperation.
- Safely, Ch. (2003). Development of greenhouse and enhancing greenhouse profitability through improved marketing planning. North Carolina. State University.
- Satari Far, M. (2006). Analysis on capital and human development. Allameh Tabatabai University press (1thed.). (In Farsi) World Bank. (1995). The Uruguay Round and the developing Economies. Retrieved from: www.worldbank.org.
- Schaffnit-Chatterjee, C. (2010). Risk Management in Agriculture: Towards market solutions in the EU. Frankfurt am Main, Germany: Deutsche Bank Research.

Schiff, M., and Montenegro, C.E. (1997). Aggregate Agricultural Supply Response in Developing Countries: A Survey of Selected Issues. *Economic Development and Cultural Change* 45(2): 393-410

Sexton, R. and Iscow. J. (1988) Factors critical to the success or failure of emerging agricultural cooperatives. *Giannini Foundation Information Series* 88-3. University of California, Davis: Giannini Foundation of Agricultural Economics.

Timmons, j. (1999), *New Venture Creation: Entrepreneurship for the 21th Century*. New York: Irwin McGraw Hill. 340-352.

Torkamani, J. (2000). Measuring productive efficiency of farmers: Techniques and application, *Iran Agricultural Research* 19: 115-128.

Torkamani, J. and Hardaker, J.B. (1996). A study of economic efficiency of Iranian farmers: An application of stochastic programming, *Agricultural Economics* 14(2): 73-83.