



DEPARTEMEN AGRIBISNIS  
FAKULTAS EKONOMI DAN MANAJEMEN  
INSTITUT PERTANIAN BOGOR

# PROSIDING SEMINAR

## Penelitian Unggulan Departemen Agribisnis

Bogor, 7 dan 14 Desember 2011



**Editor :**

Rita Nurmalina  
Wahyu Budi Priatna  
Siti Jahroh  
Popong Nurhayati  
Amzul Rifin

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## **KATA PENGANTAR**

Salah satu tugas dalam Tri Dharma Perguruan Tinggi adalah kegiatan penelitian. Dalam rangka mendukung kegiatan penelitian bagi para dosen, Departemen Agribisnis telah melakukan kegiatan Penelitian Unggulan Departemen (PUD) yang dimulai sejak tahun 2011. Kegiatan tersebut bertujuan untuk memberikan motivasi bagi dosen Departemen Agribisnis untuk melakukan kegiatan penelitian sehingga dapat meningkatkan kompetensi di bidangnya masing-masing. Kegiatan PUD tersebut dimulai dari penilaian proposal yang akan didanai dan ditutup oleh kegiatan seminar. Selanjutnya untuk memaksimalkan manfaat dari kegiatan penelitian tersebut, hasil penelitian perlu didiseminasi dan digunakan oleh masyarakat luas. Salah satu cara untuk mendiseminasikan hasil-hasil penelitian tersebut adalah dengan menerbitkan prosiding ini.

Prosiding ini berhasil merangkum sebanyak 22 makalah PUD yang telah diseminarkan pada tanggal 7-14 Desember 2011. Secara umum makalah-makalah tersebut dapat dibagi menjadi tiga bidang kajian, yaitu kajian Bisnis (9 makalah), Kewirausahaan (6 makalah), dan Kebijakan (7 makalah). Bidang kajian tersebut sesuai dengan Bagian yang ada di Departemen Agribisnis, yaitu Bagian Bisnis dan Kewirausahaan dan Bagian Kebijakan Agribisnis. Dilihat dari metode analisis yang digunakan, makalah yang terangkum dalam prosiding ini sebagian besar menggunakan analisis kuantitatif. Pesatnya perkembangan teknologi komputasi dan ketersediaan software metode kuantitatif mendorong para peneliti untuk memilih metode analisis tersebut. Ke depan metode analisis kajian bidang Agribisnis perlu diimbangi dengan metode analisis kualitatif.

Kami mengucapkan terima kasih kepada Prof. Dr. Ir. Rita Nurmalina, MS sebagai ketua tim PUD dan sekaligus sebagai Editor Prosiding ini beserta tim lainnya. Besar harapan kami prosiding ini dapat digunakan dan bermanfaat bukan saja di lingkungan kampus tapi juga bagi masyarakat luas.

Bogor, 1 Februari 2012  
Ketua Departemen Agribisnis FEM IPB

Dr.Ir. Nunung Kusnadi, MS



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# INNOVATION CAPACITY AND ENTREPRENEURIAL ORIENTATION: CASE STUDIES OF VEGETABLE FARM FIRMS IN WEST JAVA, INDONESIA

Oleh:

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## ABSTRACT

Emerging domestic and international markets for vegetable products in Indonesia provide opportunities for farmers to move from cultivating traditional products to produce high added-value products. Our study aims to investigate how entrepreneurial orientation affects the innovation capacity of farm firms. We have distinguished innovation capacity in terms of innovation adoption and innovation generation that are related to dimensions of entrepreneurial orientation, i.e. risk taking and proactiveness. In this explorative study two case studies on small farm firms in West Java, Indonesia are presented to develop a number of propositions on the effect of entrepreneurial orientation on the innovation capacity. The result shows that risk taking and proactiveness affect innovation adoption for both product and process innovation. However, only risk taking dimension affects innovation generation particularly on process innovation to solve their problem on reducing production cost.

**Keywords:** innovation adoption, innovation generation, risk taking, proactiveness, productinnovation, process innovation.

## I. INTRODUCTION

The fast development of non-traditional local and international markets for vegetable products in Indonesia implies that vegetable producers have opportunities to meet the market demand for products with high-added value. This situation stimulates vegetable producers, including smallholders, to innovate by improving their product quality.

Most studies on innovation benefit for farmers have concentrated on innovation adoption and diffusion with individual farmers as a unit of analysis. On the other hand, the majority of studies on innovation management focus on large firms, and on the cooperation of large firms (Pannekoek et al., 2005). Not many studies are conducted to innovation on farmers as firms and its relationship with the entrepreneurial orientation. Our study will fill this gap by concentrating on innovation capacity and entrepreneurial orientation of small farm firms. Our study aims to investigate how entrepreneurial orientation affects the innovation capacity of farm firms.

Our study contributes to the literature in two ways. The first is by exploring the relationship between innovation capacity and entrepreneurial behavior. Although most



studies of entrepreneurial orientation take into account innovativeness as one of the dimensions, our study put innovation capacity separately from entrepreneurial orientation. We argue that the entrepreneurial orientation is an antecedent of the innovation capacity that we want to investigate the relationship with entrepreneurial orientation. The second contribution is highlighting the importance of entrepreneurial orientation within farmers as farm firms or small rural firms, not as individual farmers. Although previous study has investigated how entrepreneurial orientation, including innovative behavior, affects performance of farm firms, it is still not conclusive on answering how farm firms develop innovation by adopting from elsewhere or generating internally (Grande et al., 2011). We need to understand why some farm firms are willing to take high risk on applying certain innovation, and being the first in markets when others do not. Our study offers an empirical attempt to explore the important factors underlying their decision.

We will present a case study on vegetable farm firms that operate by smallholders in West Java. Based on advice of experts from extension agencies and NGOs, we selected the two most innovative and entrepreneurial vegetable-farm firms to be included in our study. Both firms produce sweet pepper for non-traditional local markets (e.g. retail chains, restaurants) and international markets (e.g. Singapore market). These case studies provide empirical material and we formulate a number of propositions concerning the effect of entrepreneurial orientation on the innovation capacity of farm firms.

## **II. ENTREPRENEURIAL ORIENTATION**

Entrepreneurship focuses on exploring and exploiting opportunities by constructing current and new resources to create values (Zahra, 2005). Study on entrepreneurship has developed widely in many different levels, from individuals, groups, to firms. The concept of entrepreneurial orientation addresses at the firm level that is consistent with classical economics regarded an individual entrepreneur as a firm. Small firm is an extension of the individual entrepreneur who leads the firm (Lumpkin and Dess, 1996).

Study on entrepreneurial orientation is build upon investigation on its dimension. Previous studies construct the dimension differently. The initial concept developed by Lumpkin and Dess (1996) suggests five dimension of an entrepreneurial orientation: autonomy, innovativeness, risk taking, proactiveness, and competitive aggressiveness. Further studies elaborate the dimensions differently. For instance, some studies concentrate on two dimensions, such as proactiveness and competitive aggressiveness (Lumpkin and Dess, 2001) and proactiveness and risk taking (Grande et al., 2011). Another study focuses on three dimensions: innovativeness, proactiveness, and risk taking (Avlonitis and Salavou, 2007). Because our study is conducted in small farm firms that show characteristics as simple firms (Miller, 1983),

we follow risk taking and proactiveness as the dimension of entrepreneurial behavior that relevant for this context (Grande et al., 2011).

### **2.1. Risk taking**

Regarding to financial point of view, risk is defined as probability of loss or negative outcome. Risk taking refers to willingness to engage with large and high risk resources as well as products and markets, with high probability on failures (Lumpkin and Dess, 1996). For instance, firms involve in taking debts or changing the firm's capital structure to explore or exploit opportunities (Schulze et al., 2003, Zahra, 2005). In firm context, there are two aspects of risk: the risk related to venturing into the unknown without having sufficient information the possibility of succeeding; and the risk related to investing large amount of money into unpredictable project (Dess and Lumpkin, 2005).

Measurement the tendency of firms on risk taking can be done by investigating two points. The first is by investigating the firms' proclivity for high-risk project with high probability of very high return. The second is by exploring the firms' willingness to involve in a bold and aggressive posture to maximize the probability of exploiting potential opportunities (Avlonitis and Salavou, 2007, Lumpkin and Dess, 1996).

### **2.2. Proactiveness**

Proactiveness refers to an action on anticipation future demands, changes, or problems by seizing new opportunities (Lumpkin and Dess, 1996). It reflects a firm's ability to be the fastest to innovate and the first to introduce new products in the markets. Proactiveness involves some activities, such as seeking opportunities that may or may not related to current activities, introducing new products in front of competition, and strategically taking away the activities that are in the mature or declining stage of stages of life cycle (Lumpkin and Dess, 1996, Venkatraman, 1989).

## **III. INNOVATION CAPACITY**

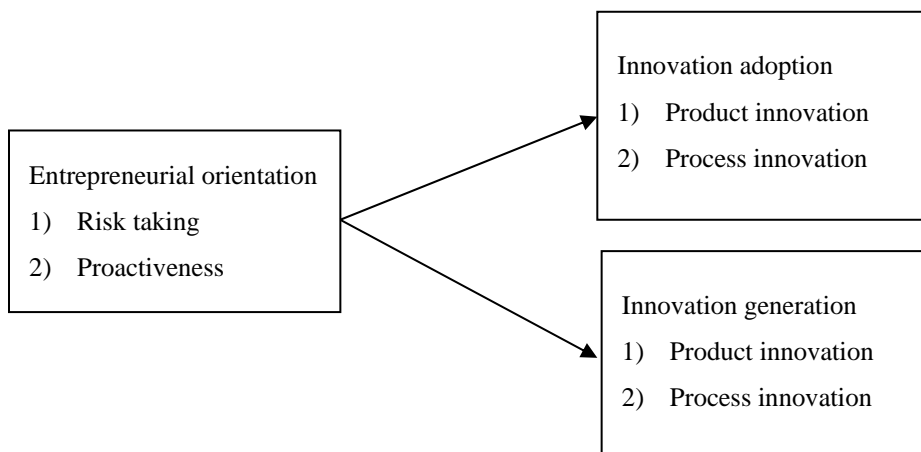
Literature generally defines innovation as the exploration and exploitation of new ideas or things in organization as a product, service, production method, market, or organizational structure (Pérez-Luño et al., 2011). This paper concentrates the innovation as product and process innovation. Newness is the essential element on innovation concept and we can find it is relative. An innovation can be new to an adopter, but it can be not to others.

We address the innovation capacity as innovation adoption and innovation generation. Innovation adoption refers to the decision of an individual or organization to acquire and utilize an idea, practice, object, knowledge, and technology from external providers that is perceived as new by adopters (Diederer et al., 2003, Pérez-Luño et al., 2011, Rogers, 1995). Innovation adoption depends on existing knowledge that involves exploitation processes such as selection, refinement, and execution

(March, 1991). As an adopter, a firm depends on the knowledge that is owned by other firms or organizations in the market (Pérez-Luño et al., 2011).

In regards to agricultural context, there are several factors influencing farmers in making decision to adopt an innovation. First, farmers may differ in ability to access new information and are more proactively in searching for information. Second, farmers may differ in their capability to anticipate on strategic consequences of innovation adoption (e.g. competitive position in markets), caused by differences in risk-taking behavior. Third, farmers may differ in their preferences in terms of time preference and time horizon, caused by differences in creativity and flexibility in applying innovations (Diederer et al., 2003).

Innovation generation indicates an innovation that is internally developed by a firm in terms of a product, process, or technology that previously unknown to the markets or to the firm (Pérez-Luño et al., 2011). Innovation generation involves the creation and utilization of new knowledge that take into account exploratory processes such as search, experiment, and discovery (March, 1991). Below is presented our research framework.



**Figure 1. Research Framework**

#### **IV. METHODOLOGY**

Our study is an exploratory study on how entrepreneurial orientation affects innovation capacity of farm firms. We put forward propositions after the empirical research (Yin, 2003). The data collection and analysis are guided by the research framework. We divided our case studies into four steps. The first was to develop the criteria of farm firms as our unit of analysis. In our study, farm firms refers to the small agricultural firms that operated by a group of smallholders. The second step was to select farmer groups that consist of smallholders who run their business similarly with firms. Based on recommendation from experts, we selected two vegetable-farm firms as the most innovative and entrepreneurial vegetable-farm firms in West Java

who sell their products to non-traditional local markets and international markets: Dewa Family and Cooperative Mitra Sukamaju. The third step was to conduct data collection and analysis. We did farm visits and in-depth interviews with the leader of each firm. To get better understanding on innovation and entrepreneurial activities developed by the farm firms, we did in-depth interviews with a representative of farm-firms' partner (i.e. Indonesian Netherlands Association – Horticulture Partnership Support Program), three representatives of extension agencies, and one buyer (i.e. *PT Mitratani Agro Unggul*). We use multiple data sources to check the validity of the data and construct. Finally, we prepared the case studies between July and October, 2011. We analyzed the data by comparing our research framework to our finding, and then we check its relationship.

## V. RESULT AND DISCUSSION: ANALYSIS OF THE CASES

We analyze the cases by looking at the way how both farm firms have developed their innovation through adoption or generation and the relationship with their entrepreneurial orientation dimensions in terms of risk-taking and proactiveness.

### 5.1. Innovation Adoption and Risk-Taking

In the cases of Dewa Family and Cooperative Mitra Sukamaju, the firms have adopted new varieties of sweet pepper that have been developed by seed companies, Enza and Rijk Zwan. These seed companies offered the firms to do trials for their new varieties in the firms' greenhouses to evaluate the suitability and productivity of their new varieties in local condition. After trial, the firms are free to decide to adopt the new seeds or not.

Both firms show a rational reason before adopting the new seeds. The firm may be interested with higher productivity of the new seed than the previous one. However, they are rational in making decision by comparing between the marginal seed's price and the marginal yield. If the marginal yield is higher than the marginal seed's price, the firms will adopt the new seed, but if not they decide not to adopt.

*“The seed company does trial several new seeds in our greenhouses. The result shows that the yields of these new seeds are higher than the seed we currently use. For instance, one of the new seeds can produce the yield 100% higher than the previous seed. However, the price is 200% higher than the current seed. So, we decide not to apply this new seed. Another type of new seed can enhance the yield for about 40-50 %, and the price is 50 % higher than the previous seed. In this case, we are interested to use the seed. We have cultivated the seed in one of our greenhouses”.*

Interview with Dewa Family

In the case of Dewa Family, they show a tendency to engage in high-risk projects for innovation on products and process. For product innovation, the firm keeps forward to produce sweet pepper that it was a new product in the beginning of the firm started its business. In 1997, the market for sweet pepper was still limited. On

the other hand, to produce sweet pepper needs much higher investment than cultivating common vegetables. However, Dewa Family continued to do trial to produce sweet pepper. To do so, Dewa Family has spent a lot of money. The firm also had market risk because the markets were very limited. As a result, the firm had an experience that it was difficult to sell its products. Over years, the demand for sweet pepper increases and Dewa Family becomes the market leader for sweet pepper market in West Java.

For process innovation, Dewa Family and Cooperative Mitra Sukamaju engage in other high-risk project for an application of wood-metal greenhouse – the HORTIN II Project – a co-innovation project between Indonesian research centers in vegetable and horticulture and Wageningen University, the Netherlands. The project aims to introduce the new greenhouse model as alternative of conventional bamboo greenhouses. The wood-metal greenhouse is more durable, can enhance productivity, and can eliminate the pest attack. Although this new type of greenhouse offers more benefits for sweet pepper producers, the implementation needs high investment. Therefore, the firms need financial support from banks. Due to the high investment, very few of sweet pepper producers are interested to implement this greenhouse model. However, Dewa Family and Cooperative Mitra Sukamaju believe that the high investment will provide them with higher return in the long run, so they are willing to engage in this project.

Both firms are committed in using high quality inputs. Because the buyer for export market requires for less residue products, both firms use recommended pesticides even though the price is doubled than the common pesticides. To achieve the less residue standard, both firms conduct the environment-friendly pest control that has been introduced by extension services and research centers. Although the prices of pesticides they use are much higher than the common ones, both firms believe that their products are better than products of other producers who still use common pesticides. It also shows their commitment to their formal contracts with the buyer.

**Proposition 1: Farm firms that have a tendency for risk taking are more likely to adopt a high-risk innovation both on product and process innovation than those that do not.**

## **5.2. Innovation Adoption and Proactiveness**

In 1997, the leader of Dewa Family and some members of Cooperative Mitra Sukamaju initiated to learn how to produce sweet pepper, a new type of vegetable in that time. They were interested to shift from cultivating traditional vegetable on open fields to cultivate new vegetable in greenhouses. At that time, they had limited access to learn how to produce and where to sell this product. Together, they hunted information about cultivating sweet pepper from various sources, such as searching in

agricultural magazines, visiting a big vegetable company that initially produced sweet pepper in Indonesia, and discussing with a Dutch manager of a seed company.

As new product at that time, markets for sweet pepper were still limited. Because sweet pepper is not original Indonesian vegetable, local consumers did not familiar for this product. The demand came from international markets. Both firms sold their sweet pepper to an exporter to supply markets in Singapore and Taiwan. The demand for sweet pepper was still limited, but both firms continued to produce sweet pepper. Both firms faced challenges to find out market alternatives. Over years the demand for sweet pepper increased, attracted other farmers to produce sweet pepper. This situation benefited Dewa Family and Cooperative Mitra Sukamaju that buyers acknowledged them as pioneer producers of sweet pepper and gave them priority to be the main sweet pepper producers.

Depend on only one buyer gave farm firms vulnerability on market risks. If the buyer collapses, farm firms would get the impact. Dewa Family realized this risk and found out the solution by expanding its markets. Dewa Family saw opportunities to enter in non-traditional local markets such as western and Japanese-food restaurant that previously imported sweet pepper from nearby countries. Afterwards, Dewa Family made a formal contract to these markets. Dewa Family then became a leader of sweet pepper producer in Jakarta and West Java markets. It was proactive in creating market alternatives for its product. This strategy helped Dewa Family to survive when the exporter stopped to buy sweet pepper because Taiwan government banned the Indonesian sweet pepper to enter Taiwan due to an insect issue. As a result, many sweet pepper producers were collapse because there were no other buyers for their products. However, Dewa Family still survived by maintaining its relationship with local markets. In the case of Cooperative Mitra Suka Maju, it was also survive from losing the Taiwan market because they already had formal contracts with buyers who supply sweet pepper for retail markets.

Regarding for product innovation, Dewa Family shows more proactive than Cooperative Mitra Suka Maju to adopt new products. The firm engages in a project to cultivate new sweet pepper types to fulfill demand of the Singapore market (i.e. sweet pepper that the colors are orange, white, and dark purple). The buyer asks the products with lower quantity then the previous ones, but they offer the high price. If the firm cannot fulfill the buyer's requirement as stated in the contractual agreement, the firm has difficulties to sell the new products to other markets. As a result, other buyers are willing to buy the new products with very low price. Although the market demand is still limited, Dewa Family keep cultivating the new products because the firm is satisfied being the pioneer in its area to produce the new products. Dewa Family also believes that as a pioneer the firm has more opportunities to maintain strong relationship with current buyers, and in the long run the firm will benefit to access more markets with unique products. In the case of Cooperative Mitra Sukamaju, it

is not interested to produce these new products because the demand is limited, so the firm focuses on producing the existing products.

**Proposition 2: Farm firms that have a tendency for proactiveness are more likely to adopt a high-risk innovation both on product and process innovation than those that do not.**

### **5.3. Entrepreneurial Orientation and Innovation Generation**

Although Dewa Family and Cooperative Mitra Suka Maju develop their innovation mostly on adoption, they involve in innovation generation, particularly on process innovation. When both firms were together in learning process in 1997, they had a problem on providing plant nutrition for their sweet-pepper plant. The nutrition was expensive that made their production cost was high. As a result, they got negative revenues after selling their products. Therefore, both firms initiated to do collaboration on experiment to make their own formulation for nutrition. After several trials, they succeeded to discover their own nutrition formula that could reduce a half of their production cost. They were satisfied for this discovery and keep utilizing their own formula until now.

During the trial process, both firms faced risks on spending amount of money for their experiment. It shows that both firms have risk taking. However, it does not show their proactiveness because the experiment does not aim to create new products to markets. The scope of innovation generation conducted by both firms is limited in process innovation, particularly to solve production problems. Regarding to product innovation, both firms have no ability to generate new products. We take into consideration that farm firms have limited resources to generate new products, specifically on human resources availability that are competent on conducting plant breeding. Therefore, for product innovation, both firms still rely on the external sources such as seed companies and research centers.

**Proposition 3: Farm firms that have a tendency for risk taking are more likely to generate a process innovation than those that do not.**

**Table 1. Comparison of Farm Firms and Their Innovation Activities**

<b>Type of innovation</b>	<b>Dewa Family</b>	<b>Cooperative Mitra Sukamaju</b>
<b>Innovation adoption</b>	High risk taking: willing to take loan for a big investment	Moderate risk taking: willing to take loan for a moderate investment
	High Proactiveness: adopting the most recent varieties and being the first in the market	Low proactiveness: keep focusing on the existing products
<b>Innovation generation</b>	Moderate risk taking: solving the problem of high production cost by creating substitution formula for plant nutrition	Moderate risk taking: Solving the problem of high production cost by creating substitution formula for plant nutrition
	No proactiveness: limited resources	No proactiveness: limited resources

## VI. CONCLUDING REMARKS

In this paper we developed a framework in which the innovation capacity is distinguished. This framework enables us to analyze how this innovation capacity may benefit from the dimensions of entrepreneurial orientation. The results of the case study partially support existing literature. Risk taking and proactiveness are widely acknowledged that affect innovation adoption. Farm firms take into account their decision on rational basis before adopting an innovation. However, on innovation generation only risk taking supports the farm firm’s decision to create a process innovation. Lack of resources limits the farm firms to generate new products for being first in the markets. Our findings are based on a limited number of case studies, so future research is needed to improve the generalization of the results by developing the propositions into testable hypotheses by using a large numbers of farm firms.

## VII. ACKNOWLEDGEMENT

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