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## Exploring Farmer-Supplier Relationships in the East Java Seed Potato Market

Joni Murti Mulyo Aji \*

*Department of Agricultural Social Economics/Agribusiness, Faculty of Agriculture, Jember University, Jember, Indonesia 68121*

### Abstract

The use of certified seed potato is believed to substantially improve potato productivity. However, in developing countries including Indonesia, most farmers perceived that the price of certified seed is too expensive for potato cultivation. Farmers, therefore, often produce and use their own seed which is usually derived from the certified seed. In East Java, some farmers usually act as local seed growers and sell their seed to others in their villages. The complexity of the buying situation faced by East Javanese farmers whenever they are willing to purchase seed prompted this study of the extent to which buyer-supplier relationships influence farmers' decision to purchase seed potato. A total of 209 farmers from the highlands of East Java were interviewed in this study. The data were analyzed using factor analysis and multiple regression analysis. The findings generally suggest that farmer-supplier relationships in the East Java seed potato market were established based on high levels of satisfaction, trust and long-term commitment. A significant positive relationship was observed between supplier's offer quality and farmers' relationship satisfaction. Such would suggest that the high level of farmers' relationship satisfaction was derived from the adequate suppliers' offer quality. However, it was the seed and service quality dimension, rather than delivery and pricing, which significantly improved the farmers' relationship satisfaction.

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\* Corresponding author. Tel.: +62 331 332190; fax: +62 331 338 422  
*E-mail address:* [joniaji@gmail.com](mailto:joniaji@gmail.com)

## 1. Introduction

Potato is usually propagated vegetatively. The need to propagate vegetatively is one of the most distinguishing features of potato cultivation. It strongly influences not only how potatoes are grown, but also where, by whom and for what uses (Horton, 1987; Rubatzky & Yamaguchi, 1997). Because potatoes are vegetatively reproduced, seed tubers can become infected with numerous viral diseases and carry many fungal diseases which may affect ware potato growth and the health of progeny tubers (Allen, O'Brien & Firman, 1992). With each successive crop, the productivity of the seed generally decreases, due to accumulation of diseases (Kloss & van der Zaag, 1988; Beukema, 1990). Hence, to maintain potato production, regular supply of healthy seed is an essential requirement.

Because of the relatively slow rate of multiplication, seed potatoes are more costly to produce and distribute than seeds of the other major food crops (Horton, 1987). To produce good quality seed and to reduce the risk of serious seed and soil borne diseases, a seed potato multiplication program requires specialized facilities and personnel (Horton, 1987, Beukema & van der Zaag, 1990).

While several attempts have been made to promote formal seed production or multiplication and establish seed certification programs in Indonesia, the fundamental constraint appears to be the high rate of seed degeneration. Seed quality deteriorates after only a few multiplications, therefore by the time the improved seed reaches the farmers, it is already contaminated with numerous tuber-borne diseases or viruses (Schmiediche, 1995). Moreover, poor management and the lack of coordination and cooperation among government departments and other institutions, as well as inadequate funds to support the very high operational expenses, are additional factors preventing a formal seed multiplication program from being established in Indonesia (van der Zaag, 1990; Batt, 1994).

The majority of the seed that the formal system is unable to supply is sought from the informal seed system. The informal seed system consists of all farmer-based activities concerning seed production, distribution and utilisation (Crissman 1990). In informal seed systems, farmers either produce their own seed or get it from other farmers (Beukema 1990). Most potato farmers in Indonesia purchase third or more generation seed from those farmers cultivating potatoes in preferred locations, where the risk and incidence of disease infection is lower (Chilver et al., 1994).

In terms of input purchasing management, farmers often buy their farm inputs from the same supplier (Kool, 1994). Good prior experiences with a supplier's offer-quality, service and performance will generate a certain level of satisfaction. As satisfaction increases, there are always expectations of relational continuity and the tendency of both parties to stay in longer-term relationships (Ganesan, 1994, Patterson et al., 1997). Satisfaction with the past outcomes indicates that there is equity in the relational exchange. Equitable outcomes provide confidence that either party is not being taken advantage of in their relationship and that both parties have concern about the other's welfare (Ganesan, 1994). Where there are high levels of confidence, trust is established. Furthermore, when trust is established, both parties are more committed to their relationships (Anderson & Narus, 1990; Morgan & Hunt, 1994; Gundlach et al., 1995; Kumar, 1996).

In East Java, where the market is highly unstable and yields are unpredictable, farmers often establish relationships with their input suppliers, traders or financiers (Adiyoga, 1995). Farmers often take out loans from their input suppliers to purchase seed and other farm inputs and repay the loan after harvest (Crissman, 1989; Siregar, 1989). Moreover, the high cost of seed and problems associated with uncertainty faced by farmers regarding the supply of seed as well as seed specification, often encourage the farmers to purchase seed only from those suppliers who are most able to reduce uncertainty. Under the situation characterised by high uncertainty, buyers are often embedded in a long-term relational arrangement with their suppliers, involving trust, loyalty and commitment (Arndt, 1979; Hakansson & Wootz, 1979; Hakansson 1982; Dwyer et al., 1987; Heide & John, 1990; Morgan & Hunt, 1994).

Buyer-supplier relationships that are characterised by trust and commitment generate advantages for both the buyers and the suppliers. Buyers achieve greater benefits from consistently receiving suppliers' better value and best prices and the ability to obtain needed product that is in short supply (Boles et al., 1997). Suppliers achieve greater buyers' loyalty and receive higher repeat sales (Evans & Laskin, 1994; Lohtia & Krapfel, 1994; Kalwani & Narayandas, 1995).

This paper describes the nature of farmer-supplier relationships in the East Java seed potato market. The farmer-supplier relationships are explained by examining variables identified as the determinants of a good buyer-supplier relationship, e.g. Batt & Rexha (1999).

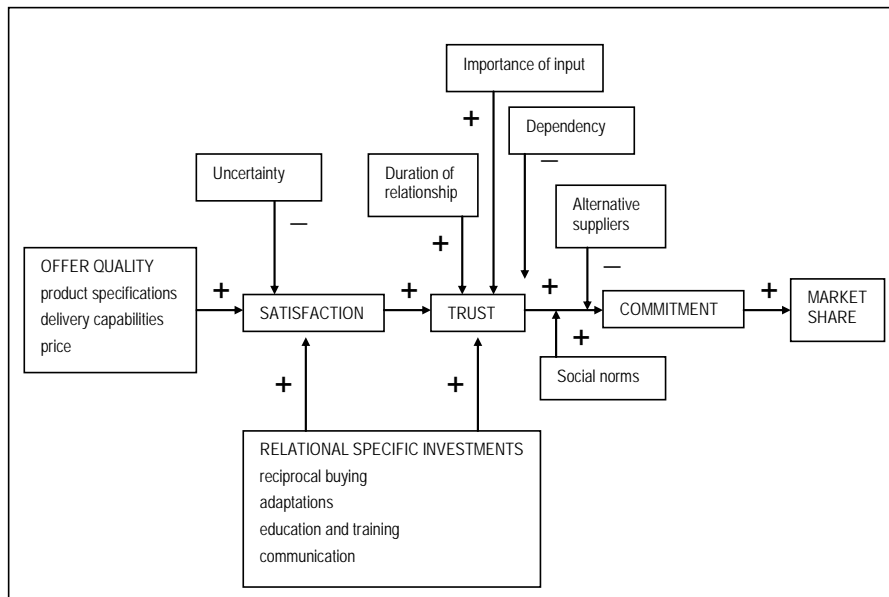


Figure 1: A Model of Buyer-Seller Relationships in the Seed Potato Industry in Asia (Batt and Rexha ,1999)

## 2. Methodology

This study involves a survey of farmers. The general aim of this study is to explore as well as examine the nature of buyer-seller relationships in the East-Java seed potato market. In order to obtain the information necessary to fulfill the project objectives, primary data was collected by personal interviews with potato farmers in East Java, using a structured questionnaire. Farmers were asked to respond to 90 statements designed to measure the nature of the relationship between farmers and their seed potato suppliers on a 7 point Likert scale from 1 (strongly disagree) and 7 (strongly agree). The statements were based on the questionnaire used by Batt (1999; 2000; 2003). The questionnaire was divided into 12 separate subsections consisting of multiple items measuring each of the relationship building variables as well as moderating variables involved in a buyer-seller relationship.

After collecting the data, the proposed measures were purified by subjecting the variables (items) to factor analysis, with equamax rotation and Kaiser normalization. Items with a factor loading below 0.4 (Anderson and Weitz, 1992) or with a cross factor loading greater than 0.4 were excluded (Batt, 2000). Further clarification of the items contributing to each factor was achieved by examining the reliability coefficient (Cronbach’s alpha). Yet, if the alpha coefficient of a factor was less than 0.5, the factor was excluded from further analysis (Nunnally, 1978). The measurements used in this study are therefore as described in Table 1.

## 3. Results and Discussion

Utilizing the mean values of the key relationship building factors provided in Table 1, it generally can be said that there were high levels of satisfaction (6.08), trust (5.92) and long-term commitment (6.41) in the farmer-supplier relationships in the highlands of East Java. However, these findings would not be meaningful if the strength and direction of the relationships between these factors as well as the influence of other moderating factors involved in the buyer-seller relationships were not investigated. In this regard, four separate regression models (equations) were performed to further explain the nature of farmer-supplier relationships in the East Java seed potato market.

These models represent four key relationship building variables, namely satisfaction, trust, and two dimensions of commitment, i.e., continuity commitment and support commitment. In the development of the regression equations, the possible presence of multicollinearity, which may inflate the standard errors of the parameter estimates, was examined. Following the recommendation of Marquardt (1970) cited by Mason & Perreault (1991) for multicollinearity assessment, the variance inflation factors (VIF) involved in the regression equation should not exceed the value of 10. Since none of the maximum VIF in all equations exceeds 10, collinearity was not considered to be a problem.

Table 1: Relationship building factors in the East Javanese seed potato market

Factors	Mean	SD	Number of measurement items	Alpha
Offer quality : Quality	5.71	1.19	4	0.71
Delivery	5.60	1.38	4	0.70
Pricing	5.81	1.31	2	0.50
Satisfaction	6.08	0.99	7	0.88
Trust	5.92	0.88	4	0.74
Commitment : Support	5.48	1.75	4	0.90
Continuity	6.41	0.76	2	0.80
Communication	5.53	1.47	7	0.92
Adaptations	5.70	1.38	4	0.86
Education and Training	5.33	1.85	3	0.84
Reciprocal Buying	2.90	1.87	1	-
Uncertainty : Seed Specification	1.70	0.97	3	0.80
Seed Market	3.28	1.56	2	0.77
Importance : Important decision	5.94	1.83	1	-
Economic consideration	5.25	1.56	2	0.55
Duration of the relationships	5.89	1.06	3	0.73
Dependence : Dependency	2.33	1.49	3	0.81
Power	3.78	1.91	2	0.66
Alternatives	5.82	1.09	4	0.70
Social norms	5.33	1.29	5	0.79

Note: (-) no alpha, measured by single item

### 3.1. Satisfaction

Utilizing the mean values of the key relationship building factors provided in Table 1, it can be said that there were high levels of satisfaction (6.08), trust (5.92) and long-term commitment (6.41) in the farmer-supplier relationships in East Java. However, these findings would not be meaningful if the strength and direction of the relationships between these factors as well as the influence of other moderating factors involved in the buyer-seller relationships were not investigated. In this regard, four separate regression models (equations) were performed to further explain the nature of farmer-supplier relationships in the East Java seed potato market. These models represent four key relationship building variables, namely satisfaction, trust, and two dimensions of commitment, i.e., continuity commitment and support commitment. In the development of the regression equations, the possible presence of multicollinearity, which may inflate the standard errors of the parameter estimates, was examined. Following the recommendation of Marquardt (1970) cited by Mason & Perreault (1991) for multicollinearity

assessment, the variance inflation factors (VIF) involved in the regression equation should not exceed the value of 10. Since none of the maximum VIF in all equations exceeds 10, collinearity was not considered to be a problem.

Table 2: Standardised regression coefficients for explanatory variables in the first regression equation

Independent variables	Standardized coefficients <sup>a</sup>	t
Offer quality: Quality	0.28***	5.04
Delivery	-0.04	-0.92
Pricing	-0.04	-1.38
Uncertainty: Seed Specification	0.01	0.22
Seed Market	0.06*	1.69
Communication	0.36***	5.53
Adaptation	0.36***	5.97
Training and Education	0.08	1.48
Reciprocal Buying	-0.11***	-4.01
F	157.3	
R <sup>2</sup>	0.88	
VIF <sub>max</sub>	6.79	

a Dependent variable: Satisfaction

\*p<0.1

\*\*p<0.05

\*\*\*p<0.01

The beta coefficient suggests that, as predicted, there was a significant positive relationship between quality offered by the seed supplier and the potato farmer's relationship satisfaction ( $\beta= 0.28$ ,  $p<0.01$ ). This would suggest that the farmer's relationship satisfaction would significantly improve as seed quality offered by the seed supplier improved. Nevertheless, no significant relationship was found between the suppliers' competitive pricing and the farmer's relationship satisfaction. Such might suggest that while the farmers sought to purchase inexpensive seed, as quality and pricing are often in conflict with one another (Nydic & Hill, 1992), the reduction of price may reduce the quality performance of the seed offered by the seed supplier. In this respect, the supplier's competitive pricing would not have a significant impact on the farmer's relationship satisfaction; indeed, to some extent it may reduce the farmer's relationship satisfaction. Likewise, no significant relationship was observed between the supplier's reliability of delivery and the farmer's relationship satisfaction. While prompted delivery was expected from the seed supplier, as it is very important in potato production, most farmers generally experienced that the availability of seed often constrained the seed supplier to deliver seed when it is required. As the seed suppliers were sometimes unable to meet the farmer's immediate needs, it is not surprising that the supplier's reliability to deliver did not lead to the farmer's relationship satisfaction.

While a negative relationship between uncertainty and the farmer's relationship was expected in the model, this study conversely found that there was a significant positive relationship between seed market uncertainty and the farmer's relationships satisfaction ( $\beta= 0.06$ ,  $p<0.1$ ). However, no significant relationship was observed between the farmers' perceived uncertainty in determining seed specification and the farmer's relationship satisfaction.

Despite instability of the seed supply in the market, most farmers did not perceive that there was high uncertainty in the seed market (mean = 3.2). This situation may indicate that, the relationships between farmers and their most preferred seed supplier, to some extent, have been able to reduce the farmer's perceived uncertainty in the seed market. Hence, it was anticipated that the farmers' relationship satisfaction would increase when the farmer-supplier relationship was able to reduce uncertainty in the seed market.

A strong significant positive relationship was found between communication and the farmer's relationship satisfaction ( $\beta= 0.36$ ,  $p<0.01$ ). Such would be an indication that communication was an important factor facilitating the establishment of farmer-supplier relationships in the East Java seed potato market. According to Cunningham

and Turnbull (1982) effective communication between buyers and sellers reduces the buyer's perceived risk. By personal contact between the buyers and the sellers any uncertainty surrounding the relationship can be resolved. As communication between farmers and seed suppliers increased, the farmers' perceived uncertainty could be resolved, and thus the farmers' relationship satisfaction would be fostered.

Another strong significant positive relationship was also observed to arise between the seed supplier's adaptations and the potato farmer's relationship satisfaction ( $\beta = 0.36$ ,  $p < 0.01$ ). A supplier's adaptations may involve product or procedure modification, innovation, as well as planning or delivery-scheduling changes to suit a buyer's needs (Frazier et al. 1988). Adaptations are important to the relationship, as relationships are basically based on some kind of match between the operation of two firms. The seed supplier's willingness to adapt with the farmers' needs increased the farmers' confidence that they were being adequately rewarded.

As most farmers are generally small farmers, with limited land, East Javanese potato farmers are progressively seeking opportunities to increase productivity per unit area. As the vast majority of the farmers only experienced formal education at primary school or less, farmers generally expect the seed supplier to provide extension and/or training programs. However, this study surprisingly found that there was no significant relationship between the seed supplier provision of extension and training programs with the farmer's relationship satisfaction. Such would suggest that the suppliers' provision of education and training programs has not met the farmers' expectation. While this might happen due to inappropriateness of technology introduced or training methods used by the seed suppliers, as most farmers are generally small farmers with limitations in capital and resources, inadequate supports from the seed suppliers often prevent the farmers from gaining benefits of the extension or training programs provided by the seed suppliers. In this regard, increasing efficacy of communication and more adaptations between both parties, such as involving the farmers in the training and education planning and the provision of financial assistance to stimulate adoption of an innovation, may be valuable to improve the farmers' perceived value of the provision of training and education programs. Notwithstanding, since not all suppliers provide regular training and education programs, increasing the frequency and regularity of the programs is also expected to improve the farmers' perceived benefits.

Some surprise was also found in the examination of the relationship between the supplier's willingness to be involved in a reciprocal buy back arrangement and the farmer's relationship satisfaction. With the vast majority of potato farmers in the highland of East Java marketing their ware potato crop to local field traders, in which many of them are also input (including seed) suppliers and financiers, a reciprocal buy back arrangement was expected to increase the farmer's relationship satisfaction. Conversely, this study found that there was a significant negative relationship between the supplier's willingness to be involved in the reciprocal buying and the farmer's relationship satisfaction ( $\beta = -0.11$ ,  $p < 0.1$ ). Furthermore, with regard to the mean score (2.90) which is relatively low, reciprocal buying was not really demanded. This might happen because the reciprocal buy back arrangement might reduce the bargaining position of the farmers and thus promote the supplier's power in the relationship. In this situation, the seed supplier might behave opportunistically. For example, the seed supplier may ask the farmer to pay more for their products and pay lower prices for the farmers' ware potato crop. With such unfavourable experience, farmers might become less adequately rewarded, and thus dissatisfied. Hence, the farmers' relationship satisfaction may decrease with the provision of reciprocal buying.

### 3.2. Trust

The second equation was run to represent the mid-sequence of the conceptual model of buyer-seller relationships proposed by Batt & Rexha (1999). In this equation, trust was predicted to be influenced by ten predictor variables including satisfaction, communication, adaptations, training and education, reciprocal buying, two dimensions of importance of the seed (i.e., important decision and economic consideration), dependency, power and duration of the relationship. The value of  $R^2$  indicates that 67 per cent of the variance in trust was explained by the ten predictor-variables included in the estimated regression equation. The standardised coefficients for explanatory variables in the second regression equations are presented in Table 3.

As predicted, a significant positive relationship was observed to arise between the farmer's relationship satisfaction and the trust that the farmer placed in his most preferred seed supplier ( $\beta = 0.20$ ,  $p < 0.1$ ). The buyers' satisfaction with the past outcomes reflects that there has been equity in the relational exchange (Ganesan, 1994). Mutuality and equitable outcomes breed the buyers' confidence that they are not being taken advantage of in the

relationship. Hence, as the farmers' relationship satisfaction increased, trust that the farmers placed in their preferred seed supplier would substantially increase.

Table 3: Standardized regression coefficients for explanatory variables in the second regression equation

Independent variables	Standardized coefficients <sup>a</sup>	t
Satisfaction	0.20*	1.69
Communication	0.24**	2.14
Adaptations	0.41***	4.00
Training and education	-0.14	-1.60
Reciprocal buying	-0.03	-0.56
Importance: Economic Consideration	0.06	1.05
Important decision	-0.18***	-3.30
Dependence: Dependency	0.05	0.84
Supplier's Power	0.03	0.53
Duration	0.12*	1.94
F	39.8	
R <sup>2</sup>	0.67	
VIF <sub>max</sub>	8.47	

<sup>a</sup>) Dependent variable: Trust

\*p<0.1

\*\*p<0.05

\*\*\*p<0.01

Importance of the product, conceptually, reflects the perceived consequences of making a wrong decision (Kool et al., 1997). Since seed was found to be the single most expensive input in the potato production in East Java, farmers consequently perceived that there was some degree of consequences of making wrong decision associated with seed purchase. In the situations where perceived consequences of making wrong decision involved, buyers are more likely to purchase from trusted suppliers (Anderson & Narus, 1990). Hence, it was anticipated that an increased perception of importance of the decision to purchase seed would significantly improve the development of trust between the farmers and their seed suppliers. Yet, this study unexpectedly found a significant negative relationship between importance of the product and trust. However, a significant negative relationship was found for only one dimension, i.e., important decision ( $\beta = -0.18$ ,  $p < 0.1$ ). No significant relationship was observed to arise between economic consideration and trust. While risk associated with the decision to purchase was expected to encourage the farmers to purchase from a trusted seed supplier, the farmers' perceived risk of making a wrong decision might also increase the amount of time the farmers allocate to the purchase decision (McQuiston, 1989). With increasing the amount of time allocated to the decision to purchase seed, farmers may evaluate a number of alternatives every time they want to purchase seed. Hence, the farmer's perceived importance of the product, to some extent, may reduce the amount of trust the farmers placed in their most preferred supplier.

Trust between the parties involved in a relational exchange is not immediately established. However, it is developed through a process over time (Etzioni, 1988). Thus, trust that the farmers placed in the seed supplier was predicted to increase with increasing duration of the relationship. As expected, a significant positive relationship between duration of the relationship and trust that the farmers placed in their most preferred seed supplier was found in this study ( $\beta = 0.12$ ,  $p < 0.05$ ).

Through adapting to each other's needs, firms demonstrate their trustworthiness to the exchange relationship. Firms, who perceive that the exchange partner has made considerable adaptations, believe that the partner has been more trustworthy (Ganesan, 1994). Hence, a positive relationship between adaptations and trust was anticipated. Indeed, this study revealed that there was a strong significant positive influence of the seed supplier's willingness to make adaptations on the trust that the farmers placed to the seed supplier ( $\beta = 0.41$ ,  $p < 0.01$ ). Furthermore, a



significant positive relationship was also found between communication and trust that the farmers placed in their most preferred seed supplier ( $\beta= 0.24, p<0.05$ ). Communication between buyers and suppliers resolves any problems arising in the relationship, prevents any conflicts that, in turn, will reduce uncertainty surrounding a relational exchange. However, the efficacy of information exchange is more important than the quantity of information (Anderson & Narus, 1990). Effective communication improves the buyer's confidence that the supplier is credible and reliable (Cunningham & Turnbull, 1982). Consequently, trust that the farmers placed in their most preferred seed supplier would substantially increase with increasing efficacy of communication between the farmer and the seed supplier. However, with some surprise, this study did not find any significant relationship between the provision of training and education programs from the seed suppliers with trust that the farmers placed in their most preferred seed supplier. As indicated earlier, this might happen if the provision of training and education programs has not been adequately provided or appropriately managed. Therefore, farmers would not feel any significant benefits arising from the provision programs. Accordingly, the provision of training and education programs from the seed supplier has not yet adequately enhanced trust that the farmers placed in their most preferred seed supplier. Meanwhile, no significant relationship was also found between the willingness of the seed suppliers to be involved in reciprocal buying and trust that the farmers placed in the seed suppliers. Likewise, if farmers did not see any benefits in making such reciprocal buy back arrangement with their most preferred seed supplier, and indeed the farmers often experienced that the reciprocal buying might increase the seed supplier's perceived power, the willingness of the seed supplier to get involve in a reciprocal buy back arrangement would have no significant impact on trust that the farmers placed in the seed supplier.

While a negative relationship between dependence and trust was expected, no significant relationship was found between trust and two dimensions of dependence included in the equation (dependency and power). The farmers' low-perceived dependence, indicated by the mean value provided in Table 1 (dependency mean = 2.33, power mean = 3.78) may be a good explanation why no significant relationship was found between the farmers' perceived dependence and trust that the farmers placed in their most preferred seed supplier.

### 3.3. Commitment

The final sequence of the model was represented by the third and the fourth equations. In these equations, two dimensions of commitment as dependent variables were predicted to be influenced by a number of predictor variables.

#### 3.3.1. Continuity commitment

The first dimension of commitment, i.e., continuity commitment, was predicted to be influenced by six predictor variables including trust, duration of the relationship, social norms and three dimensions of dependence (i.e., dependency, power and alternatives). The value of  $R^2$ , however, indicates that only 10 per cent of the variance in commitment (continuity) was explained by the eight predictor-variables included in the estimated regression equation. While the value of coefficient of multiple determination ( $R^2$ ) is said to be relatively low, previous marketing studies using regression analysis that involved (Likert) scales as the main measurement of variables (e.g., Heide & John, 1990; Moorman et al., 1992; Kool, 1994; Kool et al., 1997; Doney & Cannon, 1997) also found low values of  $R^2$ s. The standardised coefficients for explanatory variables in the third regression equations are presented in Table 4.

As expected, a significant positive relationship was observed to arise between trust that the farmers placed in their most preferred seed supplier and the farmers' long-term (continuity) commitment ( $\beta= 0.23, p<0.05$ ). Such would suggest that the greater the trust the farmers placed in their most preferred seed supplier, the greater the farmers' commitment to stay in the relationship. This finding agrees with the findings of a number of previous studies. That is, with increasing trust to the exchange partner, firms are more committed to the relationship (Anderson & Narus, 1990; Morgan & Hunt, 1994; Gundlach, 1995; Kumar, 1996).

While a negative relationship between the farmers' perceived dependence (inability to choose between alternatives) and commitment (continuity) was expected, a negative significant relationship was found for only one dimension of dependence (i.e., supplier's power). There was no indication of any significant relationship between trust and the farmers' perceived dependence as well as availability of alternatives. As farmers generally perceived



that they were being independent, the farmers' commitment to the relationship decreased when the farmers perceived that the suppliers' power in the relationship increased. Furthermore, While farmers generally perceived that they were not dependent upon their supplier and they were actually able to choose between a number of alternatives, farmers are highly committed to the relationship and unlikely willing to switch between alternative. Hence, no significant relationship between the other two dimensions of dependence and the farmers' commitment to the relationship was anticipated.

Table 4: Standardized regression coefficients for explanatory variables in the third regression equation

Independent variables	Standardized coefficients <sup>a</sup>	t
Trust	0.23**	2.42
Dependence: Dependency	0.14	1.58
Supplier's Power	-0.41***	-4.07
Alternatives	-0.13	-1.16
Duration	0.15	1.48
Norms	-0.06	0.60
F	3.66	
R <sup>2</sup>	0.10	
VIF <sub>max</sub>	2.68	

<sup>a</sup>) Dependent variable: Commitment (continuity)

\*p<0.1

\*\*p<0.05

\*\*\*p<0.01

Meanwhile, no significant relationship was also found between duration of the relationship and the farmer's long-term commitment to the relationship. Since it has been previously found that there was a positive relationship between the duration of relationship and trust, the insignificant relationship between the duration of the relationship was actually anticipated. In this respect, no significant relationship may arise due to duration having an indirect relationship with commitment but a direct relationship with trust.

### 3.3.2. Support commitment

In the fourth equation, support commitment was predicted to be influenced by three independent variables, namely duration of the relationship, trust and social norms. The value of R<sup>2</sup> suggests that 58 per cent of the variance in support commitment (support) was explained by the three variables included in the estimated regression equation. The standardised coefficients for explanatory variables in the fourth regression equations are presented in Table 5.

Table 5: Standardized regression coefficients for explanatory variables in the fourth regression equation

Independent variables	Standardized coefficients <sup>a</sup>	t
Trust	0.06	0.94
Duration	0.04	0.63
Norms	0.71***	12.90
F	94.6	
R <sup>2</sup>	0.58	
VIF <sub>max</sub>	2.68	

<sup>a</sup>) Dependent variable: Commitment (support)

\*p<0.1

\*\*p<0.05

\*\*\*p<0.01

As indicated in Table 5, a significant positive relationship was observed to arise between social norms and the amount of support commitment the seed supplier provided for the farmers. Such would suggest that the support given by the seed supplier to the farmers improved as the perceived mutuality and goal compatibility between both parties increased. Meanwhile, whilst a positive relationship was observed to arise between trust that farmers placed in their most preferred seed supplier and the amount of support commitment the seed supplier provided for the farmers, there was no indication that the relationship was significant. Similarly, no significant relationship was found between duration of relationship and the amount of support commitment the seed supplier provided for the farmers. In this respect, as a significant relationship was only observed to arise for social norms, it may suggest that social norms were the most influential variable influencing the amount of support commitment the seed supplier provided for the farmers. This finding agrees with Wilson (1995), in that mutual goals encourage mutuality of interest, which, in turn, influence the level of commitment to the relationship.

#### 4. Conclusions and Recommendation

A significant positive relationship was observed between supplier's offer quality and farmers' relationship satisfaction. Such would suggest that the high level of farmers' relationship satisfaction was derived from the adequate suppliers' offer quality. However, it was the seed and service quality dimension, rather than delivery and pricing, which significantly improved the farmers' relationship satisfaction.

The farmers' relationship satisfaction was also improved with increasing efficacy communication between the farmers and their most preferred seed supplier. Seed supplier's willingness to make adaptations was also found to significantly increase the farmers' relationship satisfaction.

While uncertainty was predicted to negatively influence the farmers' relationship satisfaction, it was interestingly found that, in the East Javanese seed potato market, uncertainty was observed to increase the farmers' relationship satisfaction. However, the significant positive relationship was only observed in one dimension of uncertainty, i.e., seed market uncertainty. Indeed, despite instability of seed supply in the market, most farmers did not perceive that there was considerable uncertainty in the seed potato market.

Another interesting facet found in this study is the negative relationship between the reciprocal buying arrangements and the farmers' satisfaction in the relationship. As reciprocal buying may potentially lower the bargaining position of the farmers, they might have had unfavourable experience with the reciprocal buying arrangements.

Notwithstanding, the farmers' relationship satisfaction was found to significantly breed trust that the farmers placed in their most preferred seed supplier. As with satisfaction, trust was also enhanced by communication and the suppliers' adaptations. However, trust that the farmer's placed in the seed supplier was found to decrease with increasing the farmers' perceived importance of the purchase decision. As the farmers' perceived importance of the decision might increase the amount of time allocated to the purchase decision (McQuiston 1989), farmers may evaluate alternatives every time they want to purchase seed. Thus, the farmers' perceived importance of the decision, to some extent, may potentially reduce trust.

Nevertheless, a significant positive relationship between duration of the relationship and trust indicates that there have been equitable outcomes in the relationship. It is also an indication that the relationship between the farmers and their most preferred seed supplier was relatively stable. In a stable relationship, firms are confident with their exchange partner and thus more committed to their relationship (Ganesan, 1994; Kim & Oh, 2002, Brennan, Canning & McDowell, 2014). Indeed, trust was subsequently found to improve the farmer's long-term commitment to the relationship.

Furthermore, farmers also indicated that there had been a considerable support commitment given by their most preferred seed supplier. Sharing in social norms was perceived by farmers to have significantly increased the amount of support commitment provided by their most preferred seed supplier.

Within such established ongoing relationships, which were developed based on high levels of satisfaction, trust and both parties' commitment, farmers were becoming less sensitive to competitors' marketing activities. Indeed, as stated by Kool (1994), the very established relationship often prevents the farmers evaluating alternative suppliers. The high level of the farmers' commitment to the relationship means that farmers were loyal to their most preferred seed supplier, and thus attempted to successively purchase only from the seed supplier.

Unlike common strategic partnerships, however, farmer-supplier relationships in East Java were traditionally established without contractual arrangement. Therefore, farmers perceived that they were independent. While there is always possibility for farmers to switch from one supplier to another in such independent relationships, it is unlikely that farmers are willing to do so. In the absence of a certified program in Indonesia, there is no third party assurance that the seed tubers the farmers purchased are of good quality (Batt & Rexha, 1999). Consequently, farmers must purchase seed from a seed supplier they rely upon, or with whom they have had a positive experience on previous occasions. In this regard, it can be said that trust remains a key variable in the buyer-supplier relationships in the East Javanese seed potato market.

Nevertheless, in such independent relationships, farmers were becoming sensitive to suppliers' power. Increasing the farmers' perception towards supplier power has been found to reduce the farmer's commitment to the relationship. If the supplier started using power in the relationship or behaved opportunistically, farmers would become less committed to the relationship and, perhaps, switch to another supplier.

Regarding the seed potato supply, inability of the seed supplier to deliver seed due to scarcity of seed, often encourages farmers to seek alternatives. When farmers start seeking alternatives, there is always the possibility of dissolution in the relationship. In this regard, as communication and adaptations were found to significantly improve satisfaction and trust, maintaining and enhancing levels of communication and product offer adaptations as well as delivering schedule adaptations are important to uphold the stability of the relationship.. While training and education programs were not found to significantly improve both the farmers' relationship satisfaction and trust, the farmers perceived benefits of the training and education program provision are expected to be improved with increasing communication and better adaptations between both parties.

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