Journal of Agriculture and Rural Development in the Tropics and Subtropics
Vol. 113 No. 1 (2012) 43–50

urn:nbn:de:hebis:34-2012061541336 ISSN: 1612-9830 – journal online: www.jarts.info

Producers' motivation for collective action for kola production and marketing in Cameroon

Amos Gyau [a,*], Bertin Takoutsing [b], Ann Degrande [b], Steven Franzel [a]

[a] *World Agroforestry Centre (ICRAF), Headquarters, Nairobi, Kenya*
[b] *World Agroforestry Centre (ICRAF), West and Central Africa Region, Yaoundé, Cameroon*

Abstract

Collective action has been used as a strategy to improve the benefits of smallholder producers of kola nuts in Cameroon. Despite demonstrated benefits, not all producers are involved in the collective action. The presented study used a modified Technology Acceptance Model (TAM) namely the Collective Action Behaviour model (CAB model) to analyse kola producers' motivation for collective action activities. Five hypotheses are formulated and tested using data obtained from 185 farmers who are involved in kola production and marketing in the Western highlands of Cameroon. Results which were generated using Partial Least Squares (PLS) approach for Structural Equation Modelling (SEM) showed that farmers' intrinsic motivators and ease of use influenced their behavioural intent to join a group marketing activities. The perceived usefulness that was mainly related to the economic benefits of group activities did not influence farmers' behavioural intent. It is therefore concluded that extension messages and promotional activities targeting collective action need to emphasise the perceived ease of use of involvement and social benefits associated with group activities in order to increase farmers' participation.

Keywords: Collective action, producers' motivation, Technology Acceptance Model, Structural Equation Modelling

1 Introduction

Kola is an important non timber forest product for the people of the Western Highlands of Cameroon. It provides many benefits including food, medicine and income (Charly *et al.*, 2012). Despite its importance, the marketing of kola is mainly informal and suffers from low levels of production and poor post-harvest handling. These key challenges reduce smallholders' ability to scale up production and bargain for better prices. In addition, the inability to bulk and add value limits the benefits which small scale producers are capable of reaping from its production and marketing. To address these challenges, development practitioners often propose some form of farmer association, collaboration and coordination to aggregate quality produce for marketing and thus achieve better economies of scale in their transactions with commercial consumers (Helen *et al.*, 2008). Collective action involving group training in production and storage facilities, negotiation abilities and group marketing, and aiming to improve smallholder benefits in the value chain have been used to improve market access and bargaining power of producers. Despite the potential benefits which have been associated with group marketing, not all producers are willing to participate. Rezaei-Moghaddam & Salehi (2010) argued that farmers' perceptions and attitudes are very important for the acceptance of a new initiative and Lin (2007) mentioned that motivation is a key factor determining human behaviour and action. Therefore, by understanding farmers' attitudes, opinions and motivation for collective action, an introduction of more effective

* Corresponding author
World Agroforestry Centre (ICRAF)
P.O. Box 16317 Yaoundé Cameroon
Telephone: 237-22 21 50 84
Fax: +237-22 21 50 89
Email: a.gyau@cgiar.org

messages and techniques which can enhance farmers' decision to participate in group activities is conceivable.

Previous research involving collective action in agriculture has examined the characteristics and assets of farmer groups which facilitate their involvement in collective action (Barham & Chitemi, 2009); determined the conditions for successful collective action (Wade, 1988; Ostrom, 1990, 1992; Baland & Platteau, 1996) and analysed how the theory of collective action can provide a more holistic understanding of the operations of markets, changes in markets and how market institutions can permit a more equitable distribution of welfare benefits (Kruijssen *et al.*, 2009). To the best of our knowledge, none has examined farmers' motivation in general and kola producers in particular. The research reported in this article fills the gap in literature by analysing kola producers' motivation to engage in collective action in the Western Highlands of Cameroon. The Technology Acceptance Model (TAM) by Davis (1989), which addresses how people come to accept and use a technology, is adapted to explain kola producers' motivation for group marketing. The TAM model will be appropriate to explain farmers' motivation as this model has been widely used in agriculture to explain farmers' attitudes (Voss *et al.*, 2008; Gyau *et al.*, 2009; Zhang *et al.*, 2009). Furthermore, collective action for kola production and marketing involves innovations in the supply chain including the use of vegetative propagation for reproduction of kola trees, conservation techniques, and grading and sorting.

Five hypotheses (H1–H5) based on an adapted Technology Acceptance Model namely the Collective Action Behaviour model (CAB model) shown were developed and tested (Figure 1). We hypothesised that farmers' intrinsic motivation will have a positive influence on their perceived usefulness of collective action (H1) and a positive influence on their perceived ease of use of collective action (H2). We further hypothesised that (H3) the perceived ease of use of collective action will have a positive influence on perceived usefulness of farmers (H3) but also on farmers' behavioural intent (H5). The perceived usefulness of the collective action will also have a positive influence on farmers' behavioural intent (H4).

2 Materials and methods

2.1 Collective Action Behaviour model (CAB model)

In order to analyse farmers' motivation for collective action, a conceptual model of farmers' collective action behaviour (hereafter CAB model) was developed based on the TAM (Figure 1). According to the CAB model, farmers' behavioural intent about the collective action initiative will be influenced by the Perceived Usefulness (PU) and the Perceived Ease of Use (PEU) of the initiatives. Both the PEU and PU are also conceptualised to be influenced by the farmers' intrinsic motivation (IM) for engaging in collective action. Deci (1972) defines intrinsic motivation as the performance of an activity for its inherent interest other than the direct economic benefits. PU refers to the users' perception of the extent to which the system will enhance their performance (Phillips *et al.*, 1994). The Perceived Ease of Use refers to the extent to which the user considers the system to be free of efforts (Zhang *et al.*, 2009). The attitude measures a person's perception about an idea or a system (Ajzen & Fishbein, 1980).

2.2 Implementation of the CAB model

To analyse the proposed model and to test the hypotheses, a questionnaire was designed based on extensive review of the literature on collective action and the TAM. All indicators were adapted from earlier applications of the TAM model to suit collective action. PU was

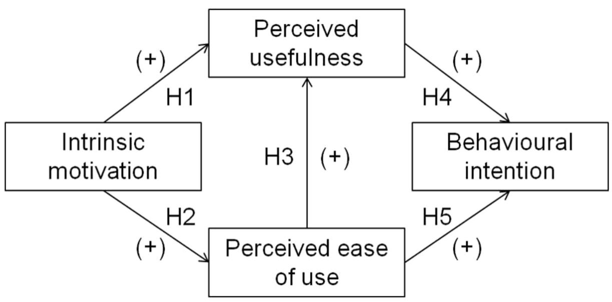

Fig. 1: *Collective Action Behaviour model (CAB model) based on the Technology Acceptance Model (TAM) by Davis (1989). Plus sign (+) indicates a positive relationship between the variables.*

conceptualised to represent the benefits that farmers expect or perceive to obtain from engaging in group activities. PEU was conceptualised to be farmers' perception of how group activities will facilitate farmers' involvement in the kola supply chain. Four statements were used to measure each of PU and PEU. Behavioural intention was conceptualised to measure farmers' planned behaviour in terms of the collective action and was measured using three statements. The statements were formulated by adapting measures developed by Saadé *et al.* (2009), de Souza Dias (1998), Adrian *et al.* (2005) and Zhang *et al.* (2009) to suit the case of collective action.

The variables derived from the literature were validated in focus group discussions with 20 farmers in the study area. The focus group discussed the relevance of the variables in the TAM model to the case of production and marketing of kola.

2.3 Data collection procedure

The study took place in March and April 2011. The questionnaire used as lead data collection instrument characterised how kola nut producers combine a set of parameters to develop livelihood strategies within specific vulnerability, institutional context and transformation processes. The parameters addressed issues of human and physical capital, kola nut production potential and participation in collective action, motivation, perceptions and behavioural intents. A three-step sampling procedure was used for the study. First, the West and North West regions of Cameroon were selected because they are major kola production zones and have an important market potential. The second level of sampling involved choosing the zones for data collection within the two regions, taking into account the level of organization of the producers and the implementation of collective action activities. Site selection also ensured that both low and high production zones were represented, and that key local kola nut production and market centres were covered during the study. A total of six zones namely: Ndu, Tatum, Batibo and Mbengwi in the North-West region and Bayangam and Bangangte in the West region were selected.

Step three of the sampling involved selection of producers from each of the six zones identified in the first two steps. Per site, 36 farmers were randomly selected among kola nut producers to participate in the survey, giving a total of 216 farmers.

Before field survey, the questionnaire was pretested for suitability and the questionnaire was adjusted in accordance to the feedback. All questions were measured on a five-point Liker scale ranging from one (strongly disagree) to five (strongly agree).

The data were collected by six trained enumerators who visited the farmers either on their farms or in their homes depending on convenience. After cleaning the data for incompleteness, 185 usable questionnaires were used for statistical analysis. SPSS version 17 (SPSS Inc., 2008) and the SmartPLS software (Ringle *et al.*, 2005) for structural equation modelling were used to analyse the data.

2.4 Testing the fitness of the structural equation model

Partial Least Squares (PLS) approach to Structural Equation Modeling (SEM) was used to test the CAB model. Both the outer and the inner models were used to test the model's validity and fitness. The outer model is the part of the model that describes the relationships between the latent variables and their indicators. The inner model is the part of the model that describes the connections between the latent variables that make up the model.

2.4.1 Outer model

The outer model is evaluated by examining the individual item reliabilities, internal consistency and convergent validity. The individual item reliabilities are examined through the loadings of the items on their respective constructs. The loadings measure the relationship between the observed variables and the unobserved (latent) variables. Only items with factor loadings of at least 0.4 were considered to be statistically significant and retained in the model (Hair *et al.*, 1998; Gyau *et al.*, 2011b). The internal consistency of the model was assessed by calculating the Cronbach Alpha (Cronbach, 1970) and the composite reliability of the measurements (Werts *et al.*, 1974). The criterion is for both indices to be greater than 0.7. Convergent validity is the degree to which indicators reflect the constructs. The average variance extracted (AVE) was used to assess the convergent validity which indicates if the construct variance can be explained by the chosen indicators (Fornell & Lacker, 1981). The minimum recommended value for each construct was 0.5 (Bagozzi & Yi, 1988), implying that the indicators account for at least 50 % of the variance.

2.4.2 Inner model

The first criterion used to evaluate the inner model was the discriminant validity, which means that every construct is significantly different from the others. To analyse the discriminant validity, a loading and cross loading matrix was obtained. All loadings should be higher than the cross loadings for discriminant validity (Gyau *et al.*, 2011b). Another criterion for measuring the discriminant validity is that the square root of the AVE should be higher than the correlation between the construct and the other constructs (Chin, 2001). This test is the Fornel-Larcker test (Fornell & Lacker, 1981).

Bagozzi (1994) suggests that the correlations between the different constructs in the model must be smaller than 0.8 indicating no multicollinearity.

2.5 The relationship between the variables in the model

To test the structural model in Figure 1, the R^2 and the significance of the path coefficients were used. The R^2 value is a measure of the construct variance explained by the model. A good model fit exists when the R^2 is high. The latent variables are the variables which are not directly observed in the model and include IM, PU, PEU and BI.

The standardised path coefficients allowed us to analyse the validation of the hypotheses. The significance of the structural coefficients was estimated based on the bootstrapping method (Elfron & Gong, 1983) with 1000 iterations.

3 Results

3.1 Respondents' characteristics

Characteristics of the respondents indicated that the majority of the respondents are between the ages of 31-60 which can be considered as the most economically active age (Table 1). Only one farmer had a tertiary education and about 19.4 % had no education. Most of the respondents were males consisting of 78 % indicating that males were over represented.

Table 1: *Characteristics of the respondents.*

Characteristics	*Number of respondents*	*Percentage*
Age		
Up to 30 years	45	24.3
31-60 years	95	51.4
61 years and above	45	24.3
Sex of respondents		
Male	145	78.4
Female	40	21.6
Experience in the business		
Up to 5 years	21	11.4
6-10 years	43	23.2
11-20 years	48	25.9
21 years and above	73	39.5
Level of Education		
No schooling	36	19.4
Primary	99	53.5
Secondary	49	26.5
Tertiary	1	0.5

3.2 Model fit indices

3.2.1 Outer model

The Cronbach alpha and the composite reliability measures indicate that the model fits the data since they are more than the recommended 0.7 cut off point (Table 2). The convergent validity measured with the AVE also indicates a good fit.

3.2.2 Inner model

The results from the discriminant validity were confirmed as all loadings are greater than the cross loadings (Table 3 & Table 4). Square root of the AVE is also higher than the correlation between the construct and the other constructs. Furthermore, the correlation between the different constructs in the model is smaller than 0.8 indicating no multi collinearity.

3.3 Relationship between variables in the model

The R^2 for the constructs PU, PEU and BI were 65.1 %, 25.9 %, and 45.3 % respectively meaning that the indicators provided a good explanation for the latent variables (Table 5). Results of the structural equation modelling revealed that four of the five hypotheses could be accepted. Thus, farmers' intrinsic motivation for collective action influences both the perceived usefulness and the perceived ease of use. Perceived ease of use also influenced the perceived usefulness and the behavioural intent. However, perceived usefulness did not influence farmers' behavioural intent towards collective action.

4 Discussion

4.1 Intrinsic motivation, perceived usefulness and perceived ease of use (H1 and H2)

Our first two hypotheses (H1 and H2) link the intrinsic motivation of the collective activities to their perceived usefulness and to the perceived ease of use. The positive impact of farmers' intrinsic motivation on the perceived ease of use and perceived usefulness of the collective action shows the importance of social benefits which farmers experience by working in groups. This corroborates with results of an earlier study of Gyau *et al.* (2011a) who found that groups formed solely for the purpose of marketing agricultural products performed only suboptimal compared to groups which were initially formed based on social needs and bonds and only engaged in marketing activities at a later time. In most cases the latter groups showed better group dynamics and commitment, resulting in higher marketing performance.

Table 2: *Variables with their factor loading, internal consistency measures, Composite reliability (Comp rel) and Cronbach alpha (Cronb) as well as the average variance extracted (AVE) of the outer model.*

Variables	*Indicator Factor loading*	*Comp rel*	*Cronb*	*AVE*
Intrinsic Motivation (IM)		0.87	0.77	0.86
Being part of the group in enjoyable	0.87			
The process of activities is pleasant	0.83			
It's always fun to be part of the group	0.78			
Perceived Usefulness (PU)		0.92	0.88	0.74
Using the collective action will improve my access to markets	0.88			
Using the collective action will increase the price I receive for my kola	0.90			
Collective action enables me to improve my negotiation power	0.81			
With collective action, I am able to sell more kola than before	0.85			
Perceived Ease of Use (PEU)		0.92	0.87	0.80
Collective action makes it easier for me to sell	0.93			
Collective action is more convenient than selling individually	0.93			
It will be easy for me to learn some marketing skills through the collective action	0.83			
Behavioural Intent (BI)		0.83	0.71	0.62
I intend to be continuously involved in the collective action	0.88			
I intend to advise other producers to join the collective action	0.71			
Even if some buyers offer better terms of trade, I would still want to sell through the group	0.77			

Table 3: *Loadings and cross loadings between indicators and construct of the inner model.*

	PEU	*BI*	*PU*	*IM*
Perceived Usefulness (PU)				
Using the collective action will improve my access to markets	0.69	0.52	0.88	0.50
Using the collective action will increase the price I receive for my kola	0.73	0.59	0.90	0.54
Collective action enables me to improve my negotiation power	0.58	0.42	0.81	0.39
Perceived Ease of Use (PEU)				
Collective action makes it easier for me to sell	0.93	0.59	0.77	0.45
Collective action is more convenient than selling individually	0.93	0.56	0.73	0.46
It will be easy for me to learn some marketing skills through the collective action	0.83	0.64	0.60	0.46
Behavioural Intent (BI)				
I intend to be continuously involved in the collective action	0.68	0.88	0.61	0.52
I intend to advice other producers to join the collective action	0.29	0.71	0.25	0.32
Even if some buyers offer better terms of trade, I would still want to sell through the group	0.49	0.77	0.40	0.46
Intrinsic Motivation (IM)				
Being part of the group is enjoyable	0.46	0.53	0.52	0.87
The process of activities is pleasant	0.44	0.41	0.50	0.83

Table 4: *Correlations of the latent variables and the AVE square roots.*

	BI	*IM*	*PEU*	*PU*
Behavioural Intent (BI)	0.79			
Intrinsic motivation (IM)	0.57	0.93		
Perceived Ease of Use (PEU)	0.67	0.51	0.89	
Perceived Usefulness (PU)	0.58	0.57	0.78	0.86

Table 5: *Expected relationship, standardised path coefficients and validation of the hypotheses derived from the CAB model (** = statistically significant at 1 % level).*

Constructs	*Expected relationship*	*Path coefficient*	*Validation*
(H1) Intrinsic motivation → Perceived usefulness	+	0.23 **	Accepted
(H2) Intrinsic motivation → Perceived ease of use	+	0.51 **	Accepted
(H3) Perceived ease of use → Perceived usefulness	+	0.67 **	Accepted
(H4) Perceived usefulness → Behavioural intent	+	0.16	Refused
(H5) Perceived ease of use → Behavioural intent	+	0.54 **	Accepted

4.2 Perceived ease of use and perceived usefulness (H3)

Farmers' perception of the importance of collective action is also influenced by the ease of use, implying that farmers will rank an initiative high if it is relatively easy for them to participate. Interventions to strengthen farmers' behavioural intent towards collective action must therefore ensure facility for farmers to get involved. This supports the proposition of Davis (1989) who argued concerning the original technology acceptance model that perceived ease of use is an antecedent of perceived usefulness. Furthermore, in a study of farmers' information usage behaviour in Iran, Zhang *et al.* (2009) also argued that if a system is easy to master, the more likely it is that the perception of its usefulness will be high.

4.3 Perceived usefulness, perceived ease of use and behavioural intent (H4 and H5)

Contrary to our expectation, perceived usefulness had no significant effect on farmers' behavioural intent to participate in collective action. This suggests that economic incentives or benefits from group activities might be trivial for the farmers. Behavioural intent to adopt collective action is influenced by its ease of use indicating that entry barrier is an important consideration for farmers' decision. Based on our results, it can be argued that even if an initiative is important and can provide benefits such as higher prices, market access and skill acquisition, farmers will not join if there are barriers to entry. This confirms preliminary findings from the qualitative phase of this research. Farmers indicated that, although group marketing was considered to be important, many of them expressed dissatisfaction with certain aspects of it like the need to wait until an agreed day by the group before their products are sold to prospective buyers. This limits their involvement in collective activities since short term financial needs might force them to conduct transactions outside the group. This result is consistent with findings of Davis (1989) that prospective adaptors' will not adopt a technology if they feel that potential benefits will be outweighed by the required efforts. From the above analysis, it can be observed that although collective action can be useful in enhancing efficiency in the kola value chain, some other factors such as its potential to provide social benefits and perception of ease of involvement can influence farmers' commitment level.

The research described in this paper offers several contributions in theory and in practice to collective action implementation, especially in developing countries. Theoretically, the paper adapts the TAM model to explain farmers' motivation in the context of adoption of collective action in general and to the kola supply chain in Cameroon in particular. From a practical point of view, the research offers suggestions on how collective activities can be made more attractive to farmers by recommending appropriate strategies for its implementation.

For instance, it is proposed that organisations promoting group action to enhance agricultural development can realign their extension messages by putting more emphasis on the social benefits associated with collective action instead of solely on the economic rewards. Furthermore, there is a need to create farmers' awareness of the social benefits and create low entry barriers to participate in group sales in order to enhance their involvement. Short term financial constraints which force farmers to sell outside the group can be tackled by facilitating farmers' access to short term low interest rate loans or advanced paying contracts while waiting for the group sales to take place. Furthermore, promoters of collective action can expand their initiatives to cover social activities which will serve as an intrinsic motivator for farmers. Here solidarity funds that can assist members in times of economic hardships by providing credits might be of interest, as this is already the local case in the traditional credit and savings groups known as "njangi", a credit system mainly organised by groups where members pool resources at a regular interval and give it to the one in need.

We adapted an established and validated TAM model to the context of agriculture collective action, the so called CAB model. However, further development of the CAB model and inclusion of additional constructs such as beliefs and socio-cultural factors will provide additional insights into farmers' motivation and adoption of collective action. Future research should therefore refine the constructs in a modified CAB model in order to provide further understanding of farmers' motivation. The model can then be tested with other farmer groups working with other products in order to validate its findings in the context of collective action.

Acknowledgements
We would like to thank the Belgium Development Cooperation for providing funds for this research through the project "Agroforestry Tree Products for West and Central Africa (AFTP4A)"

References

Adrian, A. M., Norwood, S. H. & Mask, P. L. (2005). Producers' perception and attitudes towards precision agriculture technologies. *Journal of Computers and Electronics in Agriculture*, 48, 256–271.

Ajzen, I. & Fishbein, M. (1980). *Understanding attitudes and predicting social behaviour*. Prentice Hall Inc., Eaglewood Cliffs, New Jersey.

Bagozzi, R. P. (1994). *Structural equation model in marketing research: principles of marketing research*. Blackwell Publishers, Oxford.

Bagozzi, R. P. & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, 134, 989–1006.

Baland, J.-M. & Platteau, J.-P. (1996). *Halting degradation of natural resources: is there a role for rural communities?*. Clarendon Press, Oxford.

Barham, J. & Chitemi, C. (2009). Collective action to improve marketing performance: Lessons from farmer groups in Tanzania. *Food Policy*, 34, 53–59.

Charly, F., Gyau, A., Diane, R., Foundjem-Tita, D., Charlie, M., Steven, F. & Tchoundjeu, Z. (2012). Comparison of three modes of improving benefits to farmers within agroforestry product market chains in Cameroon. *African Journal of Agricultural Research*, 7, 2336–2343.

Chin, W. W. (2001). *PLS-Graph User's Guide: Version 3.0*. Soft Modeling Inc., Houston.

Cronbach, I. J. (1970). *Essentials of psychological testing: Third Edition*. Harper, New York.

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use and User Acceptance of Information Technology. *MIS Quarterly*, 13, 319–339.

Deci, E. L. (1972). Intrinsic motivation, extrinsic reinforcement, and inequity. *Journal of Personality and Social Psychology*, 22, 113–120.

Elfron, B. & Gong, G. (1983). A Leisurely look at the boostrap, the jacknife, and the cross validation. *The American Statistician*, 37, 36–48.

Fornell, C. & Lacker, D. F. (1981). Evaluating structural equations with unobservable variables and measurement error. *Journal of Marketing Research*, 18, 39–50.

Gyau, A., Mbosso, C., Tchoundjeu, Z., Foundjem, T., Asaah, E. & Franzel, S. (2011a). Antecedents and effects of group sales on supply chain performance: The case of kola production and marketing in Cameroon. *Journal of Development and Agricultural Economics*, 3, 621–626.

Gyau, A., Spiller, A. & Wocken, C. (2011b). Price or relational behaviours?: Supplier relationship management in the German dairy industry. *British Food Journal*, 113, 838–852.

Gyau, A., Voss, J., Spiller, A. & Enneking, U. (2009). Farmer acceptance of genetically modified seeds in Germany: Results of a cluster analysis. *International Food and Agribusiness Management Review*, 12, 61–80.

Hair, J., Anderson, R. & Black, W. (1998). *Multivariate data analysis*. Prentice Hall, New Jersey.

Helen, J., Lundy, M. & Meijer, M. (2008). Farmer organisations, collective action and market access in Meso-America. *Food Policy*, 34, 16–22.

Kruijssen, F., Keizer, M. & Giuliani, A. (2009). Collective action for small-scale producers of agricultural biodiversity products. *Food Policy*, 34, 46–52.

Lin, H. (2007). Effects of extrinsic and intrinsic motivation on employee knowledge sharing intentions. *Journal of Information Science*, 33, 135–149.

Ostrom, E. (1990). *Governing the commons: The Evolution of institution for collective action*. Cambridge University Press, Cambridge.

Ostrom, E. (1992). The Rudiments of a Theory of the Origins, Survival, and Performance of Common Property Institutions. In D. W. Bromley (Ed.), *Making the Commons Work: Theory, Practice and Policy*. Institute for Contemporary Studies Press, San Francisco.

Phillips, A., Calantone, R. & Lee, M. (1994). International technology adoption: Behaviour structure, demand certainty and culture. *Journal of Business & Industrial Marketing*, 9, 16–28.

Rezaei-Moghaddam, K. & Salehi, S. (2010). Agricultural specialists' intention toward precision agriculture technologies: Integrating innovation characteristics to technology acceptance model. *African Journal of Agricultural Research*, 5, 1191–1199.

Ringle, C. M., Wende, S. & Will, A. (2005). SmartPLS, Release 2.0 (beta). SmartPLS, Hamburg, Germany. URL `http://www.smartpls.de`.

Saadé, R. G., Nebebe, F. & Mak, T. (2009). The role of intrinsic motivation in system adoption: a cross-cultural perspective. *Journal of Information, Information Technology, and Organizations*, 4, 107–126.

de Souza Dias, D. (1998). Managers' motivation for using information technology. *Industrial Management and Data System*, 98, 338–342.

SPSS Inc. (2008). *SPSS version 17.0 for windows*. SPSS Inc., Chicago, IL, USA.

Voss, J., Spiller, A. & Enneking, U. (2008). Zur Akzeptanz von gentechnisch verändertem Saatgut in der deutschen Landwirtschaft – Ergebnisse einer empirischen Analyse. *Agrarwirtschaft*, 58, 155–157.

Wade, R. (1988). *Village republics: Economic conditions for collective action in South India*. Institute for Contemporary Studies Press, San Francisco.

Werts, C. E., Linn, R. L. & Jöreskog, K. G. (1974). Intraclass Reliability Estimates: Testing Structural Assumptions. *Educational and Psychological Measurements*, 34, 25–33.

Zhang, J., Zhang, X., Mu, W., Zhang, J. & Fu, Z. (2009). Farmers‘ Information Usage Intention in China Based on the Technology Acceptance Model. In D. Li, & Z. Chunjiang (Eds.), *Computer and Computing Technologies in Agriculture II, Volume 3* (pp. 1845–1853). Springer, Boston, US volume 295 of *IFIP Advances in Information and Communication Technology*.