FACTORS AFFECTING RICE ADOPTION IN THE SOLOMON ISLANDS: A CASE STUDY OF FIU VILLAGE, MALAITA PROVINCE[1]

Elena Garnevska, David Gray, Simon Baete

Massey University, New Zealand
Head of Department: prof. Nicola Shadbolt

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A b s t r a c t. In 2006, the Solomon Islands Government implemented the Rice Development Programme aiming to promote rice growing. However, the low level of rice adoption raised questions relating to the successful implementation of this programme. The aim of this paper is to identify the factors that contributed to farmers' decision to adopt or not to adopt rice. The data collected was analysed using the qualitative analysis. This study separated the factors that influenced the farmers' decision to adopt rice technology into three broad categories: characteristics of technology, internal factors and external factor. However, it was found that poor policy implementation, poor leadership by the community leaders and poor delivery of extension service were the key factors that affected the adopters' decision to discontinue the use of the technology in the end of 2010. This study also showed that the majority of farmers in Fiu village did not adopt the technology due to the negative attributes of the rice technology such as: complexity, lack of compatibility with traditional practices, resource requirements and risk of crop failure.

BACKGROUND

For decades, the people of the Solomon Islands (SI) have depended on traditional staple crops, such as sweet potato, cassava, taro and yam for their dietary energy [*Annual Report...* 2008]. However, this trend has slowly changed over the past 50 years, as the population has developed a taste for rice and rice is now third most important crop after sweet potato and cassava. Rice was first introduced into the SI in 1942 by American soldiers during World War II [McGregor 2006, *Annual Report...* 2009**,** Warner 2007]. However, 16 years after the war, the taste for rice had grown and this resulted in the first importation of rice in 1961. Rice imports increased from 2,700 tons in 1961, to 3,322 tons in 1970. The price of rice also increased from US$144/ton in 1961, to US$ 201/ton in 1970 [FAO 2010].

The increase in the price of rice imports over the period 1961-1970, led the SI Government to intervene by implementing a food policy during the 1960s. The aim of this policy

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was to limit food imports and increase local food production. In 1966 the government leased 4,235 ha of land to a privately owned Australian commercial company "Guadalcanal Plain Limited" (GPL) for rice production [Barrett 1970]. In 1967, the GPL planted 599 ha of rice and this allowed the SI to become self-sufficient for the first time [Barrett, 1970, Fleming 1996]. In 1975, GPL formed a joint venture with the SI Brewers Solomon Associates (BSA) a local based subsidiary of C. Brewer Corporation (a Hawaiian-based agribusiness firm) to form the Sol-rice Company. This company increased the rice area from 599 ha in 1975 to 2,512 ha in 1978 and allowed SI to become an exporter of rice to Australia, New Zealand and Fiji. When exports peaked at almost USD$ 5 million in 1980, rice had become the fifth most valuable export and the third most valuable agricultural export crop after copra and palm oil [Fleming 1996].

Rice exports declined through the early 1980s and in 1986, BSA withdrew from the joint venture, after four years of experiencing successive losses due to serious insect problems, a drop in world rice prices and the high costs associated with mechanised production practices. In 1986, the rice plantations suffered serious infrastructure damage due to cyclone Namu. As a result, the Sol-Rice Company ceased rice production and exports [Fleming 1996].

Despite the liquidation of the Sol-Rice Company, the rice consumption per head increased from 37 kg in 1987 to 72 kg in 2007 (Fig. 1). This was due to a combination of population growth (2.8% p.a.), rapid urbanization and change of consumption patterns [*Agriculture Corporate...* 2009]. The rice imports also increased from over 10,000 tons in 1987 to over 35,000 tons in 2007 (Fig. 1). From 1987 the world price of rice has been increasing (Fig. 2) and in 2008, the world price of rice spiked to US$ 1,664/ton [FAO 2010]. As a consequence, per capita rice consumption in 2008 dropped to a record low of 26 kg/head (Fig. 1).

The cost of rice imports and increased rice consumption were a major concern for the SI government. To reduce rice imports, improve food security and increase local rice production, the Ministry of Agriculture and Livestock (MAL) initiated a National Rural Rice Development Programme (NRRDP) in 2006 [*Annual Report...* 2008]. A Rice Section was

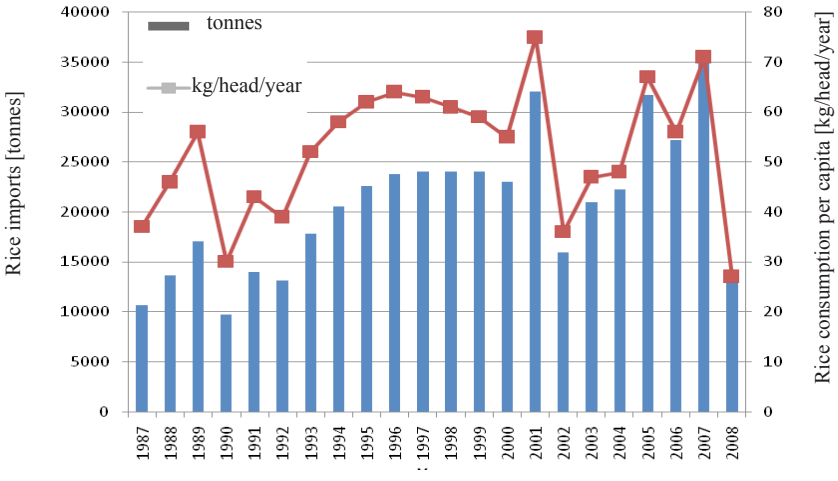

Figure 1. Rice consumption pattern in the Solomon Islands (1987-2008)
Source: [FAO 2010].

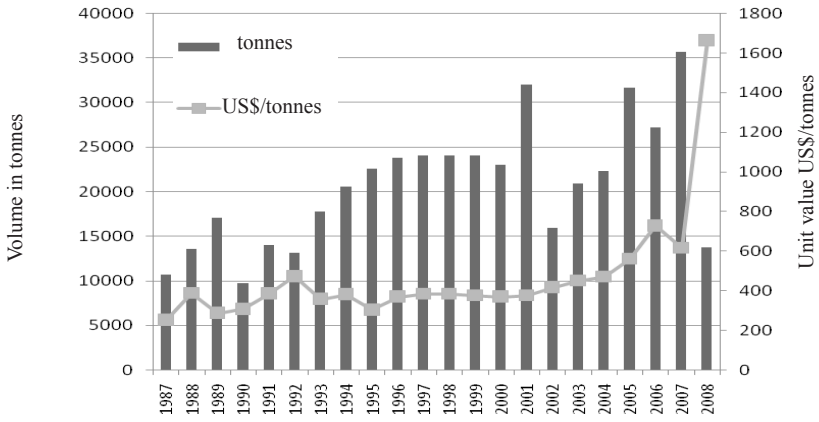

Figure 2. Rice imports into the Solomon Islands (1987-2008)
Source: [FAO 2010].

established to implement the programme and encourage local farmers to adopt rice growing. The Rice Section employed a community group approach because of the high labour requirements of rice growing. They also planned to provide farmers with assistance in the form of extension advice, labour subsidies, capital (e.g. tractors, fuel) and variable inputs (e.g. fertilizer, seeds). These incentives were to be provided for three years, to allow the rice farms to become viable and able to continue to produce without government assistance after the third year of operation [*Agriculture Corporate...* 2009]

Since the inception of the programme in 2006, the government spent approximately USD$ 1.73 million over a three year period [*Agriculture Corporate...* 2009]. Additional funds were invested in 2008, when the government provided an extra US$ 4.1 million [*Agriculture Corporate...* 2009]. In early 2010, a further USD$ 1.6 million was allocated from the government's budget, to assist with the rice programme [*National Rice...* 2010].

Despite the significant investment in this programme over the past five years, only a limited number of farmers have joined it [*Annual Report...* 2009]. NRRDP had only managed to establish 323 ha of rice in 5 years of operation, compared to their target of 3,000 ha [*Annual Report...* 2008]. This paper reports on a study that was undertaken to investigate why farmers adopted or did not adopt the rice growing technology promoted by the SI government.

RESEARCH METHODOLOGY

A single–case study approach was chosen for this research. The Fiu community Rice Project in the Central Kwara'ae Constituency of the Malaita Province was selected as case for three reasons: 1) it was the only rice project in Malaita province of the SI that was still functioning when the primary data collection was organised; 2) it was located in an area that was safe for the researcher to collect data, and 3) it was accessible, with respect to contacts and the existence of roads and transport to the study site.

The government officers involved in the rice programme and the Fiu rice committee members were the first respondents identified by the researcher. The farmers who adopted the rice technology were selected using a snowball sampling technique. In this case, the researcher used the committee members as a strategic starting point for the identification of information-rich respondents. A purposive sampling was used for the farmers who did not adopted the rice to capture a diversity of opinions and views of the members of the Fiu community.

The data collection for this research was carried out between June and July 2010. A total of 24 respondents were interviewed. The respondents included: two government officers (national & provincial levels); two Fiu project committee members; ten farmers in Fiu village who adopted rice technology; and eight farmers in Fiu village who did not adopt the rice technology.

Primary and secondary sources of data were used in gathering relevant information. The primary data was collected through semi-structured interviews that were tape recorded and later transcribed. Secondary information and relevant documents/reports were also collected from the governmental, regional and local offices relating to the Rice Development Programme as well as the Fiu community.

A qualitative data analysis technique developed by Dey [1993] was used to analyse the data. This is a three step iterative process comprising description, classification and connection. The data was transcribed, summarised and categorised to look for connections and relationships.

CLASSIFICATION OF THE CASE

The case studied is located in Fiu village in the Central Kwara'ae Constituency of Malaita province of the Solomon Islands. The age of farmers ranged between 20 to 65 years (Appendix 1). There was a low level of literacy amongst the farmers in the community. Most of the farmers had previous experience in growing rice as part of a community group in the 1990s. The main source of livelihood for the majority of people in the community was agriculture. They generated additional revenues from other activities such as fishing, pig rearing, and basket weaving. The Fiu Community Rice Project (FCRP) was situated close to Fiu village. The land on which the community rice project was located, was owned by the Church of Melanesia (COM) and leased to the community by the government for rice development. Because of this arrangement, tenure of land was therefore secure from disputes. The land area set aside for rice development was approximately 20 ha.

The case was a community project which required farmers to form a community group in order to grow rice (Appendix 2). The establishment of the community group was facilitated by local extension officers. Membership was open to all community members of Fiu village. The community rice project had 30 farmer members including six committee members. The main role of the committee was to plan and develop a work programme for rice production. There was no official constitution developed by the committee that set out formal rules to guide the project's operations. The decisions were made by the project committee with minimal consultation with group members.

The government provided support under the NRRDP for the Fiu community to grow rice. The support that the government had planned to provide to the Fiu Community Rice Project included the provision of capital and variable inputs, a labour subsidy, and the provision of rice information and technical advice from extension officers.

RESULTS AND DISCUSSION

The research findings revealed that there were several factors that influenced the farmers' initial decision to adopt or not adopt at the inception of the project in 2007. These factors could be separated into three categories: 1) characteristics of technology, 2) internal factors, and 3) external factors. These are discussed in the following section.

CHARACTERISTICS OF THE RICE TECHNOLOGY

The study identified six characteristics of technology to have influenced the farmers' decision to adopt the technology. The first four factors were consistent with Rogers [1995, 2003] adoption model. These are: relative advantage, compatibility, complexity and observability. Trialibility was not important because the rice technology requires 10-20 ha of land to be grown immediately, and therefore trialling it in a small scale was not possible. The other two characteristics of the technology that were identified related to resource use and risk.

The perceived relative advantages of rice that influenced adoption decision of farmers were: improved food security, improved income, early maturity of rice crop, improved palatability and convenience. The study revealed that flooding is the main threat to local staple production in the area. Therefore, farmers thought that because rice crop had much better storage characteristics than local staples crops, it would provide the source of food during this flooding period. The farmers also suggested that they would improve income through the sale of surplus rice and from the wages that they could receive through labour subsidy payments.

This research also revealed that adopters decided to grow rice rather than local staples because it only took three months to reach maturity, whereas the local staples took 6-11 months to mature. This meant that farmers could grow two crops of rice in the time it took to grow one staple crop which in turn could improve both their food security and income. This finding is consistent with the work of Feder and Umali [1993].

Because of a combination of poor group leadership and failure by the government to provide capital and variable inputs, many of these relative advantages did not eventuate and after two years of crop failure, the farmers decided to discontinue the project in late 2010. The result also revealed that farmers who had joined the community project and adopted rice were worse off in terms of food security and income than those that did not adopt. Azilah [2007] also reported that farmers may discontinue the use of a technology after being dissatisfied with the performance of the new idea.

In contrast to the 30 adopters, the majority of the community did not adopt the rice technology in 2007 because they believed that they would be better off in terms of food and income by growing their traditional staple crops, fishing and rearing pigs.

The rice was more complex to grow than the local staple crops. Despite this, thirty farmers adopted the rice technology because they had previous experience in rice growing and expected to receive extension support. Many of the non-adopters also had previous experience, but they did not trust the government to provide the necessary support, nor the leadership to manage the project effectively. Ogunlana [2004] and Rogers [2003] stressed that the greater the complexity of a technology the more negatively farmers may view it and that this may lead to its non-adoption.

Observability did not influence the farmers' initial decision in 2007 to adopt the rice technology because there were no similar projects within the vicinity to be observed. However, when the project was implemented during the period from 2007 to 2010, the non-adopters observed the project being poorly implemented and this confirmed that their initial decision not to adopt the rice technology was correct.

In this study, the resource use characteristics of the rice technology were capital and variable input intensive, labour intensive and land-using and had an important influence on the farmers' adoption decision. Although the adopters were aware of these negative resource-use characteristics, they believed that the government had put in place actions to overcome them. Sunding and Zilberman [2001] found that resource use characteristics often acted as barriers to adoption if they were not overcome.

In 2007, the non-adopters' perceived rice technology to be input intensive particularly when compared to their staple crops and this influenced their decision not to adopt, results consistent with the work of Khanna [2001]. The non-adopters also perceived rice growing as labour intensive, involving multiple activities and required a large labour force. They also did not adopt the technology because they also perceived rice growing as land-using compared to local crops.

The risk associated with the production of rice also influenced the farmers' adoption decision. Feder and Umali [1993] and Pannell et al. [2006] identified the risk associated with a new technology as an important factor that influenced the adoption decision of farmers. Although the adopters were aware that rice was susceptible to pests and diseases, it did not deter them from adopting the rice technology due to the available governmental support in terms of fertilisers, pesticides, and fungicide and extension support. However, when these inputs were not fully provided by the government, the rice crop was attacked by pests and diseases, and this in turn lead to crop failure.

INTERNAL FACTORS

Four internal factors that influenced the farmers' initial decision to adopt the rice growing technology were identified. These were: personal characteristic, on-farm factors, cultural factors and the leadership characteristics of the community group. Although other studies [Deressa et al. 2009, Doss and Morris 2001] have identified gender, level of education, and training as important determinants of the adoption decision of farmers, these factors did not influence the adoption decision of farmers in this study.

Age has been reported to positively influence the adoption decision of farmers [Deressa et al. 2009]. However, in this study, the results were less clear cut. Age and the labour intensive nature of the crop influenced the oldest farmer not to adopt. The majority of farmers in this study had previous experience in rice growing and community groups in the 1990's, which influenced their decision to adopt the technology. Hassan and Nhemachena [2008] and Khanna [2001] reported that previous experience with agricultural technologies had a positive influence on the adoption decisions of farmers. However, the non-adopters found that the rice programme in the 1990's did not work well and this influenced their decision not to adopt. Despite many of the adopters having negative experiences in relation to the previous rice project and other government programmes, they still adopted the technology because they believed that the government would put in place mechanisms that would overcome the problems experienced in the past.

The on-farm characteristics that were identified to have influenced the farmers' initial adoption decision included: proximity of the rice farm to farmers' home, land free from land-dispute and location of the farm close to the water source. The proximity of the rice field to the farmers' homes reduced the time and effort required to travel to the farm. In the SI, land is increasingly a subject of conflict, where tribes argue with each other over which development projects they will undertake on their land. The location of the farm on a piece of land free of dispute influenced the farmers' decision to adopt the rice growing. The location of the farm close to an available water source also affected the farmers' decision to adopt rice. Despite a number of positive on-farm characteristics, the majority of the farmers in the village did not adopt the technology.

The cultural practices of the local community also influenced the farmers' decision to adopt rice growing and showed two contrasting perspectives. Rice played an important role as the main food source during local feasts, ceremonies and other traditional village activities. Herbig and Miller [1991] and Stanley et al. [2000] reported that farmers will only adopt a technology which is compatible to their norms and cultural practices. In contrast, the non-adopters stated that one of their reasons for not adopting the technology was because it was labour intensive and that this would limit the time they had available to attend cultural activities.

Leadership characteristics of the project leaders did not influence the decision of farmers who adopted the rice technology. Both, the adopters and non-adopters perceived that the leaders of the community group had limited technical skills and knowledge in rice growing, lacked both technical and management skills and had poor attitudes. Similar leadership characteristics were identified in the literature [Damanpour and Schneider 2008]. The non-adopters stated that the leaders did not put the interests of the community group ahead of their own. They showed a lack of respect towards some group members, even though they had considerable experience in rice production.

EXTERNAL FACTORS

This research identified five external factors that influenced the farmers' decision to adopt the rice growing. These were: government policy, infrastructure development, agro-climatic condition, access to extension services, and access to markets. Similar external factors have been identified in the literature [Akpabio and Inyang 2007, Granner and Sharpe 2004, Langyintuo and Mungoma 2008, Zeller et al. 1998].

This study found that government policy was one of the most important factors that influenced the farmers' initial decision to grow rice. Government policy provided several incentives: provision of capital and variable inputs, provision of a labour subsidy, adoption of a community group approach, leasing of suitable land, and provision of advice through the extension organisation. The key element of the policy that influenced the farmers' initial decision to adopt the rice technology was the community group approach. The adopters perceived the community group approach as positive because it increased the opportunity for group members to acquire new knowledge and skills from experts within the group. Other studies [Granner and Sharpe 2004, Meinzen-Dick 2002] also reported that a community group approach has the potential for pooling the abilities, expertise and resources of people in the group. The farmers also perceived that working in a community group would allow them to share the work load.

Poor implementation of the policy influenced the adopters to discontinue the rice technology in 2010. Only three of the policy elements (leased land, labour subsidies and provision of advice) were implemented, and the labour subsidy was only implemented partially. The government had failed to deliver the capital and variable inputs such as: tractor, rice processing equipment, fertilisers, pesticides and fungicides to the farmers as promised. This led to crop failures and discouraged the farmers from continuing the project.

The village had a good road and transport system. Access to processing equipment was also found to influence the farmers' decision to adopt the rice technology. It was found that the village had rice processing equipment and as such farmers compared this situation to the 1990's, when rice was harvested and sent to Honiara for processing, which was expensive.

The agro-climatic conditions of the area also influenced the farmers' decision to adopt the rice technology. Favourable agro-climatic factors such as: soil quality, rainfall sunshine hours and temperature were perceived by farmers to contribute to high rice yields and, therefore, it was expected that this would lead to improved food security and income.

Although the infrastructure and agro-climatic conditions were good the majority of farmers did not adopt rice. They mentioned that the quality of the road and transportation system in the area had greatly reduced the cost of transporting local produce to market.

Access to extension services was one of the factors that influenced the farmers' initial decision to adopt the rice growing. The farmers perceived that since they were located close to the provincial capital Auki, they would have good access to extension services. When the project was implemented post-2007, the extension officers provided advice on rice growing, but they did not provide the capital and variable inputs. Despite the provision of good advice on rice cultivation, failure to provide critical inputs resulted in crop failure and as a result, farmers discontinued growing rice in 2010.

Market access was an important external factor that influenced the farmers' decision to adopt rice. The Fiu Rice Project was located close to three expanding markets: Fiu village, Aligegeo School and Auki. The price for rice in these markets was also increasing due to the expanding population. Other studies [Akpabio and Inyang 2007, Ransom et al. 2003, Zeller et al. 1998] also reported that good access to markets positively influenced the adoption decision of farmers. In contrast, the non-adopters did not adopt rice because of access to the three markets. In this case, there was also a growing market for local staples and the non-adopters saw this as a better source of additional income.

CONCLUSIONS

The Rice Section of the MAL encouraged and promoted rice growing to farmers in the SI in order to be able to reduce the country's rice imports and improve food security in rural areas. The study identified that the decision related to the adoption of rice as a new crop was different to most other studies in two distinct ways. First, the new crop was to be grown by a community group as opposed to individual farmers. This meant that issues such as the management and leadership of the community group were important factors that are not relevant when an individual farmer grows a new crop on his own land. Second, where the adoption of a new crop is concerned, farmers tend to consider this as a substitution problem. That is, they consider if they are better off substituting a hectare of the new crop for a hectare of their old crop. In this instance, the substitution did not occur through land use, but rather through the substitution of labour.

The factors that influenced the adoption of rice growing could be classified into the characteristics of the technology, internal and external factors. However, the influence of these factors on the adoption decision of the farmers was context dependent. As such, a factor might be important to one farmer, but irrelevant to another from within the same community. This suggests that viewing adoption from a "factor" perspective is too simplistic and that future work should investigate adoption in a more systemic manner.

The case was interesting because the technology had a number of positive attributes and the government had gone to some lengths to counter the negative attributes. Rice growing provided a number of relative advantages over the existing crops, it suited the agro-climatic conditions, the crop was valued by the community and played an important role in cultural events, and the infrastructure in terms of processing, transport, markets and access to extension support was good. Against this, the negative attributes were the complexity, lack of compatibility with traditional practices, the resource requirements of the crop and the risk of crop failure. To counter these problems, the government developed a policy that would provide extension support, capital and variable inputs, a labour subsidy, undisputed land and a community group approach. Despite this, only 30 out of 1152 farmers in the village adopted rice growing.

The major constraint to adoption was the farmers' distrust of government programmes which have failed to deliver in the past. They also distrusted the leadership of the community group because they lacked technical and group management skills and put their own interests before that of the community. The farmers that adopted rice believed that the government would provide the promised support and that the extension service would develop the capability of the leadership such that the project would succeed. Unfortunately, the government failed to deliver key inputs which resulted in crop failure and the leadership of the community group proved inept in their management of the project.

For the project to be successful, funds needed to be made available so that the MAL could provide the capital and variable inputs and the labour subsidy in a timely fashion to the community group. This would have reduced the lack of trust that the farmers had in the governments' ability to deliver on programmes and help ensure high crop yields, whilst minimising the risk of crop failure. Furthermore, the selection of community group leaders with the right attitudes, technical and group management skills was critical for the successful implementation of the project.

BIBLIOGRAPHY

Agriculture Corporate Plan 2009-2010. 2009: Solomon Islands Government (SIG). Ministry of Agriculture and Livestock, MAL, Honiara, Solomon Islands.

Akpabio I.A., Inyang E.B. 2007: *Major constraints affecting aquaculture development in Akwa Ibom State*, Nigeria, "African Journal of Aquatic Science", 32(1), 45-50.

Annual Report. 2008: Solomon Islands Government (SIG), Ministry of Agriculture and Livestock, MAL, Honiara, Solomon Islands.

Annual Report. 2009: Solomon Islands Government (SIG), Ministry of Agriculture and Livestock, MAL, Honiara, Solomon Islands.

Azilah M. E. 2007: *Adoption of Cassava Technology for Sustainable Livelihoods: A Thesis Presented in Partial Fulfilment of the Requirements for the Degree of Master of Applied Science in Rural Development at Massey University, New Zealand.* Massey University, Palmerston North.

Barrett D. 1970: *Big rice project in the Solomon Islands*. Post Courier. 4th August.

Damanpour F., Schneider M. 2009: *Characteristics of innovation and innovation adoption in public organizations: Assessing the role of managers*, "Journal of public administration research and theory", 19(3), 495.

Deressa T.T., Hassan R.M., Ringler C., Alemu T., Yesuf M. 2009: *Determinants of farmers' choice of adaptation methods to climate change in the Nile Basin of Ethiopia*, "Global Environmental Change", 19(2), 248-255.

Dey I. 1993: *Qualitative data analysis: A user friendly guide for social scientists*, London: Routledge

Doss C.R., Morris M.L. 2000: *How does gender affect the adoption of agricultural innovations?* "Agricultural Economics", 25(1), 27-39.

FAO 2010: *Statistical database – FAOSTAT. FAO*, Rome.www.faostat.org

Feder G., Umali D.L. 1993: *The adoption of agricultural innovations: A review.* "Technological forecasting and social change", 43(3-4), 215-239.

Fleming E.M 1996: *Research Options for High-Value Agricultural Exports in South Pacific Island Nations*, ISNAR, Report 10.

Granner M., Sharpe P. 2004: *Evaluating community coalition characteristics and functioning: a summary of measurement tools*, "Health Education Research" 19(5), 514.

Hassan R., Nhemachena C. 2008: *Determinants of African farmers' strategies for adapting to climate change: Multinomial choice analysis.* "African Journal of Agricultural and Resource Economics", 2(1), 83-104.

Herbig P. A., Miller J. C. 1991: *The Effect of Culture upon Innovativeness.* "Journal of International Consumer Marketing", 3(3), 7-53.

Khanna M. 2001: *Sequential adoption of site-specific technologies and its implications for nitrogen productivity: A double selectivity model.* "American Journal of Agricultural Economics", 83(1), 35-51.

Langyintuo A., Mungoma C. 2008: *The effect of household wealth on the adoption of improved maize varities in Zambia*. "Food Policy", 33(6), 550-559.

McGregor A. 2006: *Solomon Islands Smallholder Agriculture Study*, Volume 3: Market and marketing Issues. AusAID, Canberra, Australia [www document]. URL http://w.w.w.ausaid.gov.au/publication/pdf/solomon_study_vol 3.pdf

Meinzen-Dick K. 2002: *What affects organization and collective action for managing resources? Evidence from canal irrigation systems in India.* "World Development", 30(4), 649-666.

National Rice Sector Policy: (2010-2015). 2010: Solomon Islands Government (SIG). Ministry of Agriculture and Livestock, MAL, Honiara, Solomon Islands.

Ogunlana E.A. 2004: *The technology adoption behavior of women farmers: The case of alley farming in Nigeria*. "Renewable Agriculture and Food Systems", 19(01), 57-65.

Pannell D.J., Marshall G.R., Barr N., Curtis A., Vanclay F., Wilkinson R. 2006: *Understanding and promoting adoption of conservation practices by rural landholders*. "Australian Journal of Experimental Agriculture", 46(11), 1407-1424.

Ransom J., Paudyal K., Adhikari K. 2003: *Adoption of improved maize varieties in the hills of Nepal*. "Agricultural Economics", 29(3), 299-305.

Rogers E. M. 2003: *Diffusion of innovations*. New York: Free Press.

Rogers E. M. 1995: *Diffusion of innovations*. New York: Free Press.

Stanley J., Clouston B., Baker R. 2000: *Understanding land manager constraints to the adoption of changed practices or technological innovations*: Literature review. *Case Studies in Increasing the Adoption of Sustainable Resource Management Practices. Land and Water Resources Research and Development Corporation (LWRRDC), Canberra, ACT.*

Sunding D., Zilberman D. 2001: *The agricultural innovation process: research and technology adoption in a changing agricultural sector*. "Handbook of agricultural economics", 1, 207-261.

Warner B. 2007: *Smallholders and rural growth in Solomon Islands*: Prepared for: *Economics workshop on Pacific Agriculture*, Lae, Papua New Guinea.

Zeller M., Diagne A., Mataya C., Consumption, I.F.P.R.I.F., Division N. 1998: *Market access by smallholder farmers in Malawi: Implications for technology adoption, agricultural productivity and crop income*. "Agricultural Economics", 19(1-2), 219-222.

Appendix 1. Farmer and farm characteristics

Characteristics	Case study classification
Age of farmers (years)	20-65 years
Gender equality	Men usually make household decisions
Education	The majority of farmers have predominantly primary with limited secondary education. Literacy rates are low.
Experience with the technology (rice growing)	The majority of farmers had some experience with rice growing within a community project
Homogeneity	Four different tribes with four chiefs representing each tribe. The tribes share the same religion
Wealth	99% are termed as poor and only 1% are rich.
Livelihood situation	Subsistence agriculture and also gain income from fishing, pig rearing, and basket weaving.
Location of the rice farm	Close to farmers homes
Land tenure	The land is not in dispute
Farm size	20 hectares

Appendix 2. Community group characteristics

Characteristics	Case study classification
Nature of group	Formed by local extension officers
Membership	Open
Group size	30 farmers
Written constitution	No
Level of participation in decision making	Decisions were made by the leadership with minimal consultation with group members
Leadership capacity:	
Group management	Poor
Rice production	Poor

Elena Garnevska, David Gray, Simon Baete

CZYNNIKI WPŁYWAJĄCE NA ROZWÓJ PRODUKCJI RYŻU NA WYSPACH SALOMONA NA PRZYKŁADZIE WIOSKI FIU W PROWINCJI MALAITA

Streszczenie

W 2006 roku rząd Wysp Salomona realizował program zwiększania produkcji ryżu. Niski poziom jego produkcji rodzi jednak wątpliwości dotyczące skuteczności realizacji planu, którego celem było promowanie produkcji ryżu. Celem artykułu jest identyfikacja czynników, które przyczyniły się do podjęcia przez rolników decyzji o wprowadzenie (lub nie) produkcji ryżu. Zgromadzone dane poddano analizie jakościowej. Czynniki wpływające na decyzje rolników podzielono na trzy kategorie: technologiczne, czynniki wewnętrzne (związane z rolnikiem i jego gospodarstwem) oraz czynniki zewnętrzne (polityka rolna, rozwój infrastruktury, uwarunkowania rynkowe). Przedstawiono także główne czynniki, które skłoniły rolników do zaprzestania produkcji pod koniec 2010 roku (mało skuteczne wdrożenie instrumentów polityki rolnej, niski autorytet lidera grupy, niska dostępność specjalistycznych usług). Badania wykazały, że większość rolników, którzy nie podjęli się produkcji ryżu, kierowało się głównie trudnościami we wdrożeniu technologii.

Correspondence address:
Dr Elena Garnevska, Dr David Gray, Simon Baete – graduate student
Massey University, IAE & IFNHH
Private Bag, 11222, Palmerston North, Manawatu,4442, New Zealand
email: e.v.garnevska@massey.ac.nz