

WestminsterResearch

<http://www.westminster.ac.uk/westminsterresearch>

Small farmers and sustainability: Institutional barriers to investment and innovation in the Malaysian palm oil industry in Sabah

Martin, S., Rieple, A., Chang, J., Ahmed, A. and Boniface, B.

NOTICE: this is the authors' version of a work that was accepted for publication in Journal of Rural Studies. Changes resulting from the publishing process, such as peer review, editing, corrections, structural formatting, and other quality control mechanisms may not be reflected in this document. Changes may have been made to this work since it was submitted for publication. A definitive version was subsequently published in Journal of Rural Studies, 40, pp. 46-58, 2015.

The final definitive version in Journal of Rural Studies is available online at:

<https://dx.doi.org/10.1016/j.jrurstud.2015.06.002>

© 2015. This manuscript version is made available under the CC-BY-NC-ND 4.0 license

<http://creativecommons.org/licenses/by-nc-nd/4.0/>

The WestminsterResearch online digital archive at the University of Westminster aims to make the research output of the University available to a wider audience. Copyright and Moral Rights remain with the authors and/or copyright owners.

Whilst further distribution of specific materials from within this archive is forbidden, you may freely distribute the URL of WestminsterResearch: (<http://westminsterresearch.wmin.ac.uk/>).

In case of abuse or copyright appearing without permission e-mail repository@westminster.ac.uk

Small farmers and sustainability: institutional barriers to investment and innovation in the Malaysian palm oil industry in Sabah

Susan Martin (University of Hertfordshire Business School)

Alison Rieple (University of Westminster Business School)

Jane Chang (University of Westminster Business School),

Boniface Bonaventure (Universiti Malaysia Sabah),

and

Amran Ahmed (Universiti Sultan Zainal Abidin Terengganu),

Contact address and email:

Professor Alison Rieple

Professor of Strategic Management

Westminster Business School

University of Westminster

35 Marylebone Road

London NW1 5LS

UK

Tel +44 20 7911 5000

Email: a.rieple@westminster.ac.uk

NB: as each contributed equally to this paper the order of authors was decided by ballot

Abstract

The Malaysian palm oil industry is well known for the social, environmental and sustainability challenges associated with its rapid growth over the past ten years. Technologies exist to reduce the conflict between national development aims of economic uplift for the rural poor, on the one hand, and ecological conservation, on the other hand, by raising yields and incomes from areas already under cultivation. But the uptake of these technologies has been slow, particularly in the smallholder sector.

In this paper we explore the societal and institutional challenges that influence the investment and innovation decisions of micro and small enterprise (MSE) palm oil smallholders in Sabah, Malaysia. Based on interviews with 38 smallholders, we identify a number of factors that reduce the smallholders' propensity to invest in more sustainable practices. We discuss why more effective practices and innovations are not being adopted using the concepts of, firstly, institutional logics to explore the internal dynamics of smallholder production systems, including attitudes to sustainability and innovation; and, secondly, institutional context to explore the pressures the smallholders face, including problems of access to land, labour, capital, knowledge and technical resources. These factors include limited access to global market information, corruption and uncertainties of legal title, weak economic status and social exclusion. In discussing these factors we seek to contribute to wider theoretical debates about the factors that block innovation and investment in business improvements in marginal regions and in marginalised groups

Small farmers and sustainability: institutional barriers to investment and innovation in the Malaysian palm oil industry in Sabah

Introduction

In this paper we seek to contribute to wider theoretical debates (Danse and Vellema, 2005; Jackson et al., 2006; McCarthy et al., 2012; Terluin, 2003) about the socio-political and economic factors that block innovation and investment in business improvements by marginalized groups including smallholders participating in long global commodity chains. By comparison with large multinational corporations embedded in productivist systems, smallholders have the potential to develop alternative models of agro-ecological innovation, using minimal chemical inputs and including elements of land-sharing, for example intercropping and the deliberate preservation of certain rainforest trees (Dawson et al., 2014; Kitchen and Marsden, 2009; Marsden, 2013). Alternatively, smallholders may choose to engage in productivist patterns of land-sparing sustainable intensification for example through the adoption of high-yielding planting materials and chemical fertilisers (Tscharntke et al., 2012; Vermeulen and Cotula, 2010). However, an increasing number of studies from various locations show that smallholders are engaging neither in the agro-ecological nor in the sustainable intensification pattern and instead are following different paths (Author 4, 2014; Feintrenie et al., 2010; Jerneck and Olsson, 2013; Kusters et al., 2008; Otsuki, 2013; Pfund et al., 2011; Ruf, 2011). In this paper we are using neo-institutional theory to explore and interpret a specific example of 'different paths'.

In the case of Malaysian palm oil, current pressures from Western NGOs and consumers to improve the social and environmental sustainability of the industry are generating fresh definitions of business improvements linked to both the agro-ecological and sustainable intensification paradigms of innovation (Greenpeace, 2007; Teoh, 2010). Within this discourse, there is an acknowledgement by both NGOs and Malaysian policy-makers of the social justice imperative to protect the land rights and support the economic and social development of communities of independent smallholders (Cooke, 2006, 2012; Mahmud et al, 2010; Norwana et al, 2011; PACOS Trust, 2008; Pye and Bhattacharya, 2013), while at the same time these communities have been criticized for their low engagement with productivist initiatives such as subsidised fertiliser use and oil palm replanting schemes (Baskett

et al, 2008; Rahman et al, 2008; Teoh, 2010; Vermeulen and Goad, 2006).

In contrast to the various characterizations of smallholder behaviour found in the policy discourses, we explore the lived perspectives of a specific group of smallholders, oil palm cultivators in Sabah. We apply neo-institutional theory (Delmestri, 2009; Hodgson, 2006; North, 1994; Powell and DiMaggio, 1991) to support an integrated, interdisciplinary exploration of the ways in which individual actors' perceptions, priorities and behaviour are influenced by their embeddedness (or lack of it) in local ecosystems, social and political networks, and by their engagement with other participants in the palm oil commodity chain. Through semi-structured interviews and qualitative data analysis we generate fresh insights into what these smallholders do, what their priorities are, how they engage with other actors within the commodity chain, and what influences their strategies of investment and innovation across the full range of their economic activities (Author 2 et al., 2010). We reconceptualise the smallholders as micro and small enterprises (MSEs), allowing for a clearer view of their own agency within the wider institutional context, a theme which until recently has been neglected within neo-institutional theory (Casper, 2010; Jackson, 2010).

Sustainability concerns in the palm oil supply chain

The debate about how to improve the social and ecological sustainability of Malaysia's palm oil industry is one of a number of politically-shaped agendas for change in developing regions that are often driven by western consumers and food manufacturers and the organizations that supply them. Like coffee, tea, cocoa and many others, palm oil is a commodity with a global customer base that is linked by a long commodity chain to a wide range of primary producers located in developing countries with often poorly developed institutional and regulatory environments. Recently the global palm oil industry has become a particular focus for criticism from some quarters. NGOs have raised concerns about rainforest clearance and the destruction of the orang-utan's habitat, as well as about workforce conditions and the threat to local communities from the appropriation of land by large corporations (Greenpeace, 2007; McMorrow and Talip, 2001; Pye and Bhattacharya, 2013; Wicke et al., 2011). While transnational environmental and social activists focus mainly on critiquing Indonesia's corporate plantations sector, Malaysian policy-makers are equally concerned about their independent smallholder sector which is currently the fastest-growing part of the industry (Norwana et al, 2011; Teoh, 2010). Borneo (the island on which Sabah is located) is a key, and growing, region for palm oil production (see section below on the palm oil industry in Sabah for more detail) and

is therefore a focal location for policy initiatives. These are aimed at raising independent smallholder incomes in an industry where government support has traditionally been focused on state-run organised smallholder resettlement schemes and the corporate sector. They are also aimed at improving the environmental sustainability of production systems, through subsidised fertiliser distribution and agro-ecological initiatives such as livestock and crop integration schemes (Pemandu, 2012). However, officers responsible for implementing these initiatives (from the Malaysian Palm Oil Board for example) report that rural producers seem indifferent to their activities (Jalani et al, 2002; Rahman et al, 2008). They are continuing to engage in rainforest clearance and appear unwilling to invest in the improved planting materials, fertilisers and labour-intensive cultivation practices that would help them to maximise the yields from the land they have cleared (Abas et al, 2010; Mahmud et al, 2010; McCarthy and Cramb, 2009; Wicke et al, 2011). They also show little sign of generating alternative strategies to support sustainable income growth through, for example, agro-ecological 'land sharing' initiatives as have been recommended elsewhere by those operating within agro-ecological and sustainable paradigms of innovation (Greenpeace, 2007; Baskett et al., 2008; Cooke, 2012; Teoh, 2010; Vermeulen and Goad, 2006).

Very little research has been undertaken on understanding the attitudes of Sabahan smallholders towards sustainability or into the factors influencing their patterns of investment and innovation, whether in palm oil production or in other activities within their working and family lives. Our paper presents an attempt to understand smallholder behaviour and their own lived experiences and perceptions, and in so doing help to explain why the issues identified by policy-makers and NGOs appear to be meeting with such resistance.

The next section of the paper explains why neo-institutional theory offers an appropriate framework to support such an inquiry.

The guiding analytical framework: neo-institutional theory

Neo-institutional theory (Delmestri, 2009; Hodgson, 2006; North, 1994; Powell and DiMaggio, 1991) offers a powerful analytical approach that can surface the historical and socio-political influences on current economic and agronomic behaviour, supporting an integrated exploration of the ways in which individual actors' perceptions, priorities and behaviour are influenced by their embeddedness (or lack of it) in local ecosystems, social and political networks, and by their engagement with other participants in a long global commodity chain. In applying concepts from this body of theory to fresh empirical data, we hope to provide an insightful analysis of

the factors that interplay in the lives of micro-sized palm oil producers in a remote rural environment.

Neo-institutional theory (Powell and DiMaggio, 1991; Selznick, 1996; Scott, 1987 and 2008; Tolbert and Zucker, 1996) provides a useful framework for understanding the factors affecting rural Malaysian palm oil producers as it focuses attention on both economic and political factors as well as directing attention to institutional logics such as those that arise from culture or language and linguistic schema (Bourdieu, 1991; Delmestri, 2009). It is a theoretical lens that encourages a focus on local issues, specific to time and place; and on the path that has led to present structures, that is, to the prevalence within a given organizational field (for example, an industry in a region) of specific social rules which structure interactions (Hodgson, 2006). Practices such as sustainable intensification may in themselves become institutions if they are internalized as norms by actors within the field, and/or codified and prescribed as a condition of membership of a group such as the Roundtable for Sustainable Palm Oil. The behavioural rules which constitute institutions may be written or unwritten, explicit or implicit, simple or complex, and supported by moral or instrumental rewards and sanctions, as illustrated in taxonomies such as Kasozi's (2008).

Over the past 15 years the neo-institutional lens has become increasingly popular among strategic management scholars, especially those exploring processes of strategic development and change within an emerging-economy context (Dacin et al., 2002; Dhanaraj and Khanna, 2011; Hoskisson et al, 2013; Levy, 2008; Mair et al, 2012; Pinkse and Kolk, 2012; Régner and Edman, 2014; Wright et al., 2005; Xu and Meyer, 2013). Meanwhile, neo-institutional theory itself has continued to evolve, especially through the integration of concepts from agency theory and the sociology of translation (Akrich et al., 2002a, 2002b; Emirbayer and Mische, 1998) to strengthen understanding of the processes through which actors respond to institutional pressures and in so doing, exert pressure for change within the institutions in which they are embedded.

The role of institutional context

In order to begin analysing the process through which a given individual or organization becomes aware of pressure to internalize new ideas circulating within an organizational field, accepting them as norms, it is necessary to establish the institutional context within which the actor operates, critically evaluating the extent of their embeddedness in the relevant range of structures at industry, national and international levels. To explore embeddedness is to focus on the importance of

social relations and the trust or mistrust that emerges from actors' experience of participating in them. These may smooth, or alternatively obstruct, the process of building and sustaining transactional economic relationships, particularly networks of exchange that enable the flow of resources such as knowledge, as well as tangible goods (Granovetter, 1985; Murdoch et al., 2000). As Krippner (2001, p. 785) says, 'congealed into every market exchange is a history of struggle and contestation that has produced actors with certain understandings of themselves and the world that predispose them to exchange under a certain set of social rules and not another.' Path dependency, and the length of times that effects last, are important concerns for the institutional theorist.

Recent comparative institutional research into Asian business systems has revealed that Malaysia's distinctive pattern of state-business relations, characterized as personal capitalism by Carney and Andriessse (2014) has marginalised and excluded numerous social groups within peripheral regions such as Sabah. This highlights the relevance to our research of the strand of neo-institutional theory focusing on institutional failures and voids (North, 1994). Institutional failures due to for example corruption or unclear governance frameworks (Nordberg, 2011; Tonoyan et al., 2010) can have damaging effects on economic performance, social well-being, and the propensity to innovate and invest. Entrepreneurial theory suggests that successful innovation and growth only happens in a stable institutional context (Grabher, 2002). The weaker the institutional framework, the costlier and riskier will be contract enforcement and inter-firm coordination (Boschma, 2005; Lundvall, 1992), favouring those who can afford the necessary costs.

Institutional logics

The concept of institutional logics helps us to explore the dynamics of our smallholders' belief systems, including attitudes to sustainability and innovation, as they come up against others within the field, or indifferent fields such as those of the Malaysian outreach officials and NGOs. Although there are competing definitions of the terms, some theorists, beginning with Meyer and Rowan (1977) and Zucker (1987), focus on the role of the role of belief systems such as culture and cognition in the process through which strong ties develop within organisational fields. Such theorists see institutions as the reification and expression of belief systems expressed in taken-for-granted rules that develop as a result of social processes such as mimetic or coercive isomorphism. In this view, institutions are delimited by the logics that define their content and meaning (Scott, 2008; Thornton et al., 2012). Logics are concerned with how cultural and cognitive structures shape behaviour

and organizational arrangements. In a recursive process they shape the macro institutional context which in turn influences the institutional logics, or interpretive schema, of participants within a specific field.

Institutional theory helps us to assess the instrumental economic and social factors that influence logics, and therefore whether practices become adopted within a field. Generally, both institutional theorists and innovation adoption theorists say that the adoption of new ideas does not happen unless the practice acquires sufficient perceived value, whether this value is symbolic or economic. It is known, for example, that rural people are sometimes reluctant to engage with policy initiatives to improve productivity (Callon, 1986). One explanation for this is that at a local level, belief systems are shaped by local experiences and values, few of which incomers can access. They cannot draw upon knowledge concerning the local ecology and have different experiences which may be perceived as irrelevant, impositional and/or intrusive. Such logics are regarded as alien and untrustworthy, and are rejected. However, institutional logics are dynamic; they can change, and be changed. For this to happen logics need to meet, interact, and be amended through the activities of participants in the various fields. Where there are gaps between the fields, the fields' logics stay the same (Campbell, 2006, 2007; Delmestri, 201; Winn and Angell, 2000). In contrast, where individuals participate in more than one organisational field they can begin to develop fresh institutional logics combining elements from these fields. Two ways of doing this are of special relevance to this paper: firstly, the relatively well-known trajectory of subsistence-oriented smallholders who become more entrepreneurial through engaging in commercial production (Pritchard et al, 2007; Sturgeon, 2010; Tucker, 2010); and secondly, the more recently identified and less widely studied trajectory of hybrid entrepreneurs who combine waged employment with self employment, as farmers for example (Woods, 2007; Burke et al, 2008; Burmeister-Lamp et al, 2012; Folta et al, 2010) or who run shops as well as farms. Part of our contribution in this paper is to develop an understanding of the interplay of the different contextual factors influencing the logics that shape Sabahan smallholders' investment and innovation decisions.

To summarise, from this review of the literature we have identified a range of factors that could influence the propensity to innovate and invest in sustainable agricultural practices in rural Sabah. These include structural factors such as property rights in land and other resources, including the legal and administrative systems enforcing these; as well as relational factors such as belief systems and political and family ties. Institutional theory prompts us to explore the way these factors interrelate and

change over time, as well as the way in which they enable and constrain the behaviour of agents in a given time and place.

The research location: Sabah, Malaysia

This section describes features of the local context that affect MSE palm oil farmers in Sabah, on the Island of Borneo. These features help us to identify some of the background to the formal and informal institutions that influence their propensity to invest and innovate. The information that we describe here is derived from industry and government reports, national trade and industry statistics, as well as the knowledge of the country that two of the paper's authors have gained from living and working there over many years.

Malaysia is a democratically elected state, with a stable coalition government. It is a growing player in international trade and economics, although it is still characterised as a developing country with a stated ambition to become a developed country by 2020. However, corruption and a weak regulatory infrastructure are problems (McCarthy and Cramb, 2009). The system of property rights, for example is ambiguous (Doolittle, 2005; Hall et al., 2011), particularly in the less central regions. Similarly, the roads and transport infrastructure are not as good as they need to be, particularly in the more remote regions such as Sabah.

Sabah is a State within Malaysia located on the island of Borneo, some distance from the centre of power and government in Kuala Lumpur (Figure 1). Unlike peninsular Malaysia, which was ruled during the colonial era as set of British colonies and protectorates, Sabah and other regions in Borneo were controlled more indirectly. Sabah and neighbouring Borneo territories are still not completely subsumed within the control of peninsular Malaysia, and indeed Brunei remains an independent Sultanate.

Insert Figure 1 about here

Ethnically Sabah is also strikingly different from peninsular Malaysia. The two largest ethnic groups in Sabah, the Kadazan Dusun and the Bajau, are both specific to Sabah and account for 18% and 14% of the population respectively. Malays, the dominant ethnic group within Malaysia as a whole, account for just 6% and Malaysian citizens of Chinese ethnicity, who play a key role in the wider national economy, make up a further 9% (Malaysian Census, 2010). Malaysian citizens of Indian ethnicity, who make a major contribution to both business and the civil service elsewhere in the country, are barely present in Sabah, and form only 1% of the

population. Non-Malaysian citizens, by contrast, account for a very high proportion, 28%, reflecting the region's geographical and historical links with the Philippines as well as with neighbouring parts of Indonesian Borneo. The remaining 24% of Sabah's population is fragmented into over 30 small indigenous ethnic groups (Bumiputera -Lain) speaking more than 50 languages and 80 dialects (PACOS Trust 2008).

In Malaysia as a whole the transport infrastructure is not as good as it needs to be, given its ambition to achieve developed country status, but this is particularly so in remote areas such as Sabah (Cooke, 2012; McCarthy and Cramb, 2009). Thus palm oil farmers here are geographically distant both from mills and ports in a region with poorly maintained roads (Figure 2).

Insert Figure 2 about here

The Sabahan location of palm oil smallholders in our sample

The palm oil industry in Sabah

The palm oil industry accounted for 10% of Malaysia's exports in 2012, the third most important source of export income (Department of Statistics Malaysia, 2014). The oil palm planted area in Malaysia reached 5 million hectares in 2011, an increase of 3% over 2010. Sabah is the largest producer with 1.43 million hectares or 29% of the total. Neighbouring Sarawak, also on Borneo, is the region where the oil palm cultivated area is growing most rapidly, by 8% between December 2012 and December 2013, and by 5% in the previous year, in contrast to the growth rate in the rest of Malaysia which was under 1% per annum (MPOB, 2013; MPOB, 2014). Malaysian crude palm oil production in 2011 was second only to Indonesia, with Thailand 3rd, but way behind (Index Mundi, 2012). Malaysia, on the other hand, only ranks 7th for growth of the industry, compared to 10% for Thailand and 8% for Indonesia (ibid). Malaysia exports almost all of its palm oil to countries such as China (22.1%), the European Union (11.2%), Pakistan (10.1%), India (9.3%), and the USA (5.8%) (MPOB, 2012).

Palm oil is only producible in the tropics, and typically in lesser developed countries. Palm oil has very high yields per hectare, and a very wide range of applications from food processing to detergents, biodiesel and oleo-chemicals (Corley, 2009).

Because of its GM free status it is potentially acceptable to 'green' consumers, were it not for issues around deforestation (Sabah is noted for the rich biodiversity of its rainforests), destruction of the orang-utan's habitat, and social justice (Author 1,

2004; Pye and Bhattacharya, 2013). In Western Europe and the USA, there is widespread public concern about these issues, where big corporations expanding their palm oil plantations are well known agents in the process of rainforest destruction, especially in Indonesia (McMorrow and Talip, 2001; Pye and Bhattacharya, 2013; Greenpeace, 2007; Wicke et al., 2011). Paradoxically, given the well-known problems of big companies destroying rainforest to plant oil palm trees in neighbouring Indonesia, Malaysian corporations have been working closely with the national government and the non-governmental Roundtable for Sustainable Palm Oil to develop socially responsible working practices and sustainable technologies, including carbon capture (Reinecke et al, 2011; Teoh, 2010). The most pressing difficulties now are perceived to lie in mobilising the smaller growers and millers to adopt these new technologies and ways of working.

In fact, the apparent mismatch between the market's demand for low-priced, sustainably-produced, ethical and high quality food ingredients and two of this paper's authors' awareness of the apparent reluctance of some rural communities in Malaysia to respond to these pull factors was a stimulus to undertaking this study. There had been little apparent enthusiasm in the Sabah region for investing in innovation, adopting sustainable practices, or raising employment and welfare practices to what many in the developed world would deem acceptable standards (Author 4, 2014; Rahman et al., 2008). Borneo in general – on both the Malaysian and Indonesian sides – is the region where the planted area has been expanding most rapidly since the 1990s, generating intense and well-publicised debates on illegal felling and destruction of the orang-utan's habitat. Planners are attempting to alleviate this pressure by encouraging rural producers to raise their incomes by adopting improved high-yielding planting materials and sustainable cultivation techniques. However there is evidence that many rural producers are not engaging with these initiatives and in particular they prefer to raise incomes by expanding the cultivated area (Teoh, 2010; Baskett et al., 2008).

As a result, rural MSE palm oil producers have been the target for initiatives from the government, such as the Malaysian Palm Oil Board (MPOB) and Pusat TUNAS (government extension officers) as well as from NGOs and development agencies. However, there is increasing awareness that some of these initiatives have not been as successful as was hoped, to the extent that the Roundtable for Sustainable Palm Oil (RSPO) has even been accused of 'greenwashing' (Reinecke et al., 2011). NGOs are highly influential commentators on the issues and are increasingly engaging with Western retailers in the process of designing certification schemes (Adderley and

Mellor, 2014) but their apparent inability (Author 4, 2014) to engage with smallholder communities was another strong driver for this study. One practical impact of our research, we hope, will be to improve their ability to frame the problem and interact effectively with small farmers, and to address the unintended socio-political outcomes of environmentally focused producer certification schemes. Sabah has strong micro regional cultural loyalties, and also linguistic conventions that are different from peninsula Malaysia. These tend to affect their ability to participate in the discourses favoured by multinational buyers, or governmental or NGO representatives (Pye and Bhattacharya, 2013).

Although licensed by the Malaysian Oil Palm Board and hence included within Malaysia's formal regulatory frameworks, many smallholders in Sabah lack access to fresh supplies of land (Cooke, 2012; Hall et al., 2011). Insecure land rights and weak institutional controls (Tonoyan et al., 2010) provide significant obstacles to maximising the productivity of investments in new technologies or planting materials: the more valuable the stand of oil palm trees planted, the more likely it is that alternative claimants will appear to contest the land ownership rights of the smallholder who planted them (Cooke, 2006; Tonoyan et al., 2010).

Many are known to conduct at least some of their operations outside Malaysia's formal regulatory and investment frameworks (Cooke, 2009). This happens for two main reasons. Firstly, the inhabitants of this particular region are economically and socially marginalized and disadvantaged compared to the mainland Malays (Then, 2009; Loo, 2009; Cooke, 2012), who tend to hold more powerful roles as government agents or industry middlemen. Secondly, smallholders' perceptions of lax regulations and government corruption make operating in the informal economy an attractive option (Reid, 1997; Cooke, 2009). This can take the form of 'below the radar' use of land, perhaps virgin forest (Daily Express, 2009, 2010) or the appropriation of farm land, previously devoted to other crops such as rubber or pineapples, whose ownership is uncertain.

Added to this is the problem of low bargaining power in relationships with other participants in the supply chain (Thien, 2008; Then, 2009; Mahmud et al., 2010; Norwana et al., 2011). Sabahan smallholders are dependent on a small number of mills, suppliers of key inputs such as fertilizers and seeds, and agents to whom they can sell their produce (Ayat et al, 2009). The combination of poor local education standards, lack of experience in the industry (as a result of multiple jobs and previous experience with different crops), and lack of awareness of different perspectives means that these middlemen are especially powerful (Williamson,

1981; Vermeulen and Goad, 2006). The miller's judgement of the quality of the farmers' oil is the only one smallholders have. Their own poor educational standards means that millers are also not best placed to advise growers of the yield potentials of their crops, the lack of knowledge of palm oil diseases such as Ganoderma, or the ways in which innovative use of materials or planting methods could help this (Author 4, 2014; authors' personal knowledge).

Infrastructure factors

Many of the smallholders in Sabah are based in areas with poor soils and infrastructure. Here land is steep, typically rocky and with shallow peat cover, poorly drained and sometimes swampy, and prone to flash flooding in the heavy local rains (ICZM Project, 1998). The Sabah government's 1960's policy of setting up smallholder resettlement schemes had good intentions. However, the land they chose was not the most suitable for oil palms, often having poor soil quality, poor water supplies, an unsuitable climate, or poor accessibility. The government's apparent failure to assess the topographical features of the land appears to have worsened the ecological impact today, increasing soil erosion and increasing the impact of floods and road damage.

The remoteness of the region also means that smallholders are geographically distant from mills, agricultural supplies, and ports in a region with poorly maintained roads. Poor transport is a critical disadvantage within the palm oil industry, because oil palm fruit bunches bruise easily, causing free fatty acids to accumulate quickly within the oil. Oil palm fruit needs to be transported smoothly and to be milled within 24 hours of harvest in order to maintain the quality of the oil (Ayat et al, 2009). When transport difficulties occur, fruit remains stranded at the roadside waiting to be collected, or reaches the mill in damaged condition. This topography means that the smallholders are in a poverty trap: the poor quality soil requires higher levels of fertilizer in order to increase productivity, which increases the cost of production and the poor infrastructure results in higher maintenance costs and lower profits.

Methodology

As suggested above, this research commenced because of the involvement of two of the authors in the Malaysian development process. Our personal experiences generated an interest in the reasons why Sabahan palm oil smallholders were apparently not embracing more sustainable or innovative practices. Following a chance discovery of a common concern with issues of environmental degradation

and social justice in developing countries, three of this paper's authors came together in 2011 and embarked on discussions about some of the theoretical reasons why the engagement of smallholders with innovation for sustainability was apparently not happening in Sabah. Our initial conversations revealed a shared interest in the application of neo-institutional theory to surface the historical and socio-economic influences on current behaviour. We drew on our understanding of Malaysian policy issues as well as on theory relating to institutional context. This was followed up by a review of the academic and industry literatures, as well as popular sources such as websites and newspapers in Malaysia. These allowed us to begin conceptualising our enquiry and to frame the questions used to structure the initial data gathering.

Data gathering commenced when one author went to Sabah for the summer holidays and undertook some informal interviews and group discussions with friends and acquaintances who work in the palm oil industry. A focus group was conducted with four smallholders (meaning those farming less than 4 hectares) in August 2011 in the local language. The discussion was directed towards finding out the local smallholders' experiences and to sensitise the researchers to issues that may have not been identified from the literature review. The focus group discussion was recorded and transcribed and translated into English.

The analysis of the focus-group findings informed the question areas to be explored in the 34 semi-structured individual interviews of the main study. The pilot study also highlighted the methodological challenges that we would face in the main study. These included the cost of conducting further interviews in the region, language difficulties, as there are different ethnic groups in the area, gaining access to enough smallholders who would be willing to talk, and so on. This suggested that collaboration with local academics in Sabah was essential. As a result, calling once again on personal relationships, two further authors of this paper were co-opted into the research team. Both work in Malaysian universities and have contacts in the field.

Further conversations with the two new Malaysian members of the research team, further helped to refine the interview questions and techniques that were used for the main study and which were conducted by the locally-based authors. Even so, persuading interviewees to talk sometimes proved challenging in the initial stages, as the interviewer was perceived to be an agent of the government. Later interviews became more free-flowing as the interviewer was able to develop an introductory briefing to the research process which appeared to reassure interviewees that they

were not under suspicion of wrongdoing. Subsequent analysis of the transcripts provided ample evidence for interviewees' initial reluctance to engage. The challenges of the research process also provided compelling supporting evidence for some of the subsequent findings – the need for fluency in the local dialects, the time it took to reach the interviewees - at least two hours' drive from the local university to the smallholders' homes as a result of the poor local road infrastructure, and the need to understand local cultural norms, such as the need to sit on the floor to conduct the interviews, as chairs were reserved for important visitors. Interviewing commenced in July 2012 and finished in June 2013. Interviews were voice and/or video recorded with the permission of participants, transcribed and translated from Bahasa Malaysia into English by a Sabahan research assistant who is fluent in both languages. Most interviews were conducted in the smallholders' homes. Interviewees were identified through a snowballing technique, following introductions by personal contacts and other interviewees. Personal contacts were an essential element in gaining access to the smallholders. There are profound cultural, linguistic and geographical barriers to be overcome if academics in the west are to be able to hear the voices of these individuals.

Data analysis

The key themes to emerge from the focus group data could be aggregated into two main categories - institutional context and institutional logics. Within the category of institutional context were a number of factors to do with land rights, corruption, land quality, in terms of soil and infections, supply and distribution chain access, access to resources such as labour or technical support, costs of compliance, the geography and remoteness of the region, and knowledge acquisition structures. Within the institutional logics category were issues of ethnic and social groupings, linguistic and behavioural conventions, experience of farming, hybrid entrepreneurship, and attitudes of the local population towards the State, and officials' attitudes towards the smallholders.

The main interview data were analysed using thematic qualitative analysis (Patton, 2005; Skerratt, 2013) using NVivo 10 as an analytical aid. The questions in the interviews were used as categories and all responses for each question were examined to identify areas of consensus and differences and the emergence of sub-themes. Unanticipated themes were also noted. This approach allows a meaningful interpretation of the rich interview data.

Results

In this section we discuss our findings. Our discussion is structured around three themes: institutional context, personal influences on institutional logics, and the effects of these on behaviour. In doing this we are not attempting to provide definitive answers about smallholder behaviour, but simply to attempt to describe and understand the influences on Sabahan smallholders' investment and innovation decisions.

The first thing to say is that none of our cohort of smallholders were investing to a great extent in either innovative technologies or sustainable methods, despite the efforts put into encouraging this by organisations such as the Malaysian government and the MPOB. But, different individuals had different reasons underpinning their choices, and it is these influences that we focus on here.

We could discern two main groups within our 34 respondents:

- 1) Hybrid entrepreneurs - those who have a palm oil smallholding plus off-farm employment or self-employment, for example as mechanics or shopkeepers.
- 2) Specialist smallholders who had income from oil palm cultivation, and occasionally other crops and livestock, but no off-farm income.

A question emerged therefore from our data analysis: do the smallholders who depend entirely on farming for their income exhibit different attitudes to sustainability or the adoption of innovative farming methods from those who have other sources of off-farm income? We structure the discussion of each group's attitudes around the factors that appeared to influence their behavioural choices, grouped into: 1) institutional context (including access to land, capital and other resources); and 2) personal factors influencing institutional logics (including experiences, education and personal demographic characteristics) (summarised in Table nn).

Table 1 **Summary of Findings**

Discussion

In this section we pull out and discuss the most material of the findings summarised above, given our interest in the smallholders' propensity to invest in sustainable production or innovative farming methods. Some of the findings appeared to have

little relevance (age and ethnicity for example) despite our initial predictions that they would be material.

Smallholders and Land Ownership

Although for the most part licensed by the Malaysian Oil Palm Board and hence involved, in theory, in Malaysia's formal regulatory frameworks, many of the smallholders lacked legal access to good quality land. Local systems of land rights are multi-layered and ambiguous, and government titles recognizing individual ownership of land are often allocated haphazardly in ways influenced by current contestation as well as historic administrative decisions (Doolittle, 2005). Many of our smallholder group, in both hybrid and specialist categories, were aware of historical land-grabbing, or had experienced it themselves. An example of this was provided by four ethnic Chinese smallholders who claimed that they had been unable to obtain land rights as a result of their ethnicity. Between 2004 and 2008 they had participated in a large cooperative project in which approximately 150 ethnic Filipino and Chinese smallholders applied for formal title to a 5,300-acre plot of land in Tawau District, in the south-east of Sabah. They were encouraged to do so by the local Department of Land and Survey. Pending the award of this title, they planted oil palms on the plot. This practice is widely followed within Sabah because of the slow pace with which land title applications are normally processed. However, four years later, once the trees had reached maturity, two alternative Bumiputera claimants to the land emerged who were able to prove legal title from prior to 2004. As a result the co-operative's members lost the ownership of the oil palms that had been planted and nurtured to maturity. All respondents agreed that they had been misled by officials and that "within the government, there is just a pile of problems." Thus, to plant trees which visibly enhance the economic value of a given plot of land was perceived as being likely to attract the attention of land-grabbers or opportunistic fruit-gatherers, generating anxiety which appeared to provide an obstacle to the smallholders making long term investments, thus providing support for research that suggests that successful innovation and growth only happens in a stable institutional context (Grabher, 2002).

Many of our respondents described the Malaysian Land registry department as a weak institution that, despite its supposed role of granting land rights to citizens, could take as long as ten years to register ownership. Frustrating administrative obstacles were reported, as one respondent details:

"I just feel that this issue has been very irritating. This land originally belonged to my ancestors, after they had passed away, their names were replaced with the second

owner. However, when this owner had died, we have tried to return the rights of the land to the original family, but it has been disallowed on the grounds that some of the original owners are no longer with us. The only way for the land to be returned to the original family is by having the signatures of all the original owners whose names were on the contract, however that is not possible since some of them have died."

Another respondent highlighted a lack of trust in the impartiality of the registration process:

"We have applied for permission for many other plots of land but it is still being scrutinised. I feel that the authority is rather biased when deciding to whom they would provide permits to plant in these lands as they would often favour big companies ... Take my family for example, I am the second generation of planters in this region, say when my children are older and wish to follow my footsteps, I would give him a small piece of my land to try his hands. However, if more than one wishes to do likewise, how am I going to be able to provide enough to all of them? That area then you can see there, used to be timber. Now it is mostly governed by estates with thousands and thousands of acres. That is the issue with the government."

The slowness and perceived unreliability of the formal registration process encouraged the 'under the radar' acquisition of land often not the most suitable for oil palms, having poor soil quality, poor water supplies, an unsuitable climate, and poor accessibility.

Farm Expansion, Investment and Credit

The delays and difficulties of establishing legal title to land help to explain why smallholders were reluctant to claim assistance for improving their land or adopting new, more sustainable, methods of production, and/or to create the sorts of cooperatives that would enable economies of scale to be achieved (Cooke, 2006, 2012; Hall et al., 2011; Vermeulen and Goad, 2006). Seven of the specialist smallholders we interviewed had recently expanded their oil palm planted area, but had funded this entirely themselves, without recourse to bank loans or even short-term cash advances from the mills to which they sold their fresh fruit bunches (FFB). The hybrid entrepreneurs showed a greater propensity to obtain bank loans and cash advances, but were not using these to expand their oil palm holdings. Several mentioned that they would be interested in cultivating additional land if they had better access, time and money but this was expressed as a hypothetical possibility and in practice they were devoting time and money to alternative uses, for example education for their children or investing in a shop. This behaviour implies an underlying scepticism about whether the palm oil industry is worth investing in for the future.

We could discern few differences between the hybrids and specialists as to their preferences as to how they obtained credit. Both hybrid entrepreneurs and specialist farmers exhibit a strong belief in self-funding for farm investment. However the hybrids showed slightly greater interest in obtaining bank loans compared to the specialists. One specialist smallholder had obtained and paid back a bank loan in the past, and was loyal to the miller she regularly supplied because they offered her short-term loans; but this farmer had made no recent extensions or improvements to her farm. As argued above, the specialist farmers' lack of interest in obtaining bank loans to support their expansion may well be related to fear of land-grabbing and a general distrust towards outsiders. However, it may also stem from a lack of relevant knowledge and skills to undertake the process of accessing funds. Seven out of the eighteen specialist smallholders (39%) had no formal education, and only three (17%) were educated to secondary level or above. In contrast, all of the hybrid entrepreneurs had some formal education, and ten out of the sixteen (63%) were educated to secondary level or above.

In all cases, a preference for, and dependence on, self-funding limits the potential for developing the smallholding. A lack of capital also reduced the smallholders' ability to acquire the technical resources necessary to increase yields and fight against deadly fungal attacks on the oil palms, thereby reducing profits and the capital available to invest.

Apart from self-funding, bank loans, and the much rarer option of cash advances from the millers, the main alternative source of finance would be government-linked organisations such as Pertubuhan Peladang Kawasan (PPK), a large co-operative agricultural trading organisation whose members can potentially obtain loans from it as well as selling their palm fruit to it, and buying seedlings and fertiliser from it, sometimes (although not often) with the benefit of government subsidies. However, neither hybrid entrepreneurs nor specialist smallholders reported having actually received credit from PPK.

Bargaining Power and Productivity

Most of our smallholders had low bargaining power relative to that of middlemen such as suppliers and millers; they were price takers rather than price makers. This may well have resulted in them getting relatively low prices from the mills; certainly they received prices that did not differentiate between different grades of fruit. Both hybrid entrepreneurs and specialist smallholders reported that the millers routinely told them that all their fruit was grade A when all other indicators suggest that this is

likely to be untrue. As with smallholders in many other countries and agricultural sectors, low bargaining power is likely to have combined with low productivity to limit their incomes and hence their potential for self-funded innovation and growth. Access to labour, which is a pressing issue in Malaysia's plantations sector, was not mentioned as an issue by any of our respondents. This may well be linked to the small size and generally limited expansion of their existing oil palm holdings. Only two respondents, both hybrid entrepreneurs, had holdings larger than 25 acres. Of these, one (whose holding was 45 acres) employed two permanent workers and got further help from his children with harvesting. The other (whose holding was 70 acres of which 60 was under oil palms and the rest under fruit trees) also employed two permanent workers and got further help from three or four family members with harvesting.

Transport infrastructure, on the other hand, was mentioned as a key problem by five out of the eighteen specialist smallholders (28%), and by a further one out of the 16 hybrid entrepreneurs. The government was criticised as being unwilling or unable to maintain the local roads adequately in the face of hilly terrain and frequent torrential rainstorms.

Our respondents were united in their dissatisfaction with the road infrastructure, commenting that even Land Rovers found the roads hard to negotiate, especially during the rainy season when floods are common and the hilly surfaces become mudslides. As one respondent commented, "even though the roads are accessible however they can change whenever we are expecting rain." Another confirmed, "At the moment the roads to the factories are poor, the vehicle that I have will not manage to go uphill."

The poor infrastructure reduces the ability of smallholders to acquire knowledge such as technical know-how relating to farm management (for example a number of our interviewees were unable to understand the difference between organic and inorganic fertilizers), but also information about the SPOC (sustainable palm oil clusters) initiatives and sustainability concerns further up the supply chain had simply not been heard.

Given our interest in the Sabahan smallholders' propensity to invest in sustainable practices or innovative technologies, one important aspect to investigate is how they learn about new initiatives and ideas, and how they understand the market pull factors that shape what is bought and for how much. The evidence from our study suggest that there is little awareness of these issues from either hybrids or specialists: Our smallholders could be described as disconnected - from the

plantations sector, NGOs, government outreach agents and consumers alike. As suggested above this is partly the function of the geographical remoteness of the region, the ethnic isolation of many of the smallholders, the distrust of outsiders and the strong culture of self reliance and autonomy (Stewart and Roth, 2007; Brandstätter, 2011).

However, for the hybrid entrepreneurs in particular this simple explanation is insufficient, for they were not disconnected from the formal sector in other respects. Not only were they all educated formally, as noted above, but also eleven out of the sixteen respondents in this group (69%), three of whom were pensioners, derived income from formal-sector occupations including those of: driver, mechanic, port employee, civil servant and worker in the palm oil plantations sector. This suggests that they may be described as disconnected from the discourse relating to innovation for productivity and sustainability within the palm oil industry specifically, rather than within the local formal sector in general.

Buyer and Seller Relationships

Generally, the smallholders' linkages to the wider palm oil supply chain came through their local buyer, typically the miller. Most smallholders were not loyal to one buyer. Their decision as to who to sell to was partially governed by whether they could transport the fruit there, either in their own truck or through renting space in someone else's. Sometimes the FFB (fresh fruit bunches, which are quickly perishable) were abandoned on the roadside because of a lack of available transport. Another factor, mentioned by a small number of respondents, was whether the miller was prepared to loan money when cash flow was tight. More widely seen as important was whether the miller was perceived to have weighed the bunches fairly or assessed the fruit as top quality 'A' grade - and therefore paid the best price. Five specialist smallholders and three hybrid entrepreneurs commented that the millers always graded their own, or all, FFB as 'A', and only one mentioned the possibility that lower quality fruit might be graded 'B'.

This suggests that millers rarely if ever paid a price premium for superior quality fruit; and this is a factor that could easily have contributed to the failure to invest in better planting technologies. One hybrid entrepreneur, who was generally one of the best informed respondents in terms of awareness of potential innovations, had invested in a relatively large farm. He had undertaken some planting experiments and had replanted in order to obtain better fruit. However, when selling to the government-linked agricultural co-operative trading organisation *Pertubuhan Peladang*, he

discovered that he had been given the same price by weight for his FFB (fresh fruit bunches) as that offered to other smallholders whose bunches were visibly inferior. He had therefore decided to build a relationship with a neighbouring plantation company and sold to them instead. Such a lack of discrimination on the part of a major buying agency acts as a deterrent to smallholders' investment in improved planting materials and techniques designed to raise FFB quality. But one interesting question that is as yet unresolved is why the smallholders are so unquestioning about the prices they are offered, and why the majority are not interested in imitating the one pioneer we could identify. There is apparently a deeply-embedded culture of rather passive price-taking rather than market-sensing. But why this is so was not revealed by our data.

Any official attempt to erode the power of the millers over the smallholders who supply them with fruit, for example by encouraging the smallholders to form marketing co-operatives under the supervision of extension workers from the MPOB, appears to have had little success. In this area considerable importance is attached to a 'coffee shop' culture, where the influence of neighbours and friends is especially strong. In this very *exclusive* context, tacit knowledge and biases are shared readily, and outsiders are rare. Few of our interviewees were aware of best practices from elsewhere in the industry, and SPOC methodologies were not known about.

Although most have phones and access to the internet and the information to be found there, few knew how to make sense of it, and there were few examples of people who were prepared to stand out. Even the hybrids, who encounter different perspectives when they enter the different organisational fields in which they participate, did not appear to be any more willing to challenge the purchasing structures within the region.

Attitudes to sustainability and investment

It is in their attitudes to investing in the palm oil industry that we could discern some important differences between the hybrids and the specialists. Ten (63%) of the hybrids were not obviously investing in any significant way in their plantations, whereas this applied to only eight (44%) of the specialists. Eight of the specialists (45%) were investing in either improvements or expansion compared to two (13%) of the hybrids. Three of the hybrids (19%) were choosing to invest off-farm compared to none of the specialists. This picture suggests that the hybrids are only weakly interested in their plantations, having other competing, and maybe more profitable, calls on their funds and time. One hybrid described his farm as disappointing, explaining that because he was working he didn't have time to look after it - and

yields were, consequently, low. But he also illustrates some of the conflicting influences on decision-making: he can't afford fertiliser so mulches low-quality FFB instead, putting empty shells round the trees and showering them with palm oil. However, he also said that even if he used proper fertiliser his yields would still be low because the farm is on hillside, with uneven ground. So there is evidence that there is a perception that investment is not worth it. Nevertheless he is applying for a grant to acquire more land. The question, therefore, is why are the hybrids farming at all - especially given the problems described above about the inability to obtain formal rights to their farms and the fear of land grab.

One potentially significant detail is that none had been growing oil palms for fewer than five years, and eleven out of the sixteen (69%) had been growing oil palms for ten years or longer. When combined with the information noted above about recent plantings, that seven out of the eighteen specialist smallholders (39%) had recently extended their oil palm holdings, whereas none of the hybrid entrepreneurs had done so, this suggests that the hybrid entrepreneurs were relatively disengaged from the process of envisioning and creating a future in the palm oil industry. This is consistent with hypotheses advanced within the emerging theory of hybrid entrepreneurship, that the characteristic institutional logic of hybrid entrepreneurs whose activities span multiple organisational fields prioritises portfolio-building and the generation of multiple options to be kept open simultaneously, rather than placing a high value on the single-minded pursuit of efficiency and effectiveness within a given organisational field.

In terms of the choices that the smallholders were making of fertilizer, seeds, and planting technologies, the hybrids on the whole appeared to be better informed - although this was from an extremely low base. Both groups wanted to improve yields, wanted to receive subsidies for fertilizers, but both groups had almost no knowledge of, or interest in, the 'sustainability' of the chemicals in it. Although the hybrids seemed to have a better understanding of the differences between types of fertilizers, choices were not made on sustainability or ethical grounds but on purely economic or effectiveness ones. Of the sixteen hybrid one third were knowledgeable about some sustainability issues, such as organic methods, intercropping and climate change. However, only four were adopting these methods, and none wholeheartedly. The eighteen specialists were much less likely to have experimented with organic or other types of sustainable methods, and very few appeared to be aware of the issues. Many were unable to identify the type of fertilizer they used, or if they were, why they tended to prefer chemical fertilizers.

Only a couple had actually used organic fertilizers, and had subsequently rejected them on the grounds of cost ineffectiveness.

Conclusions: implications for further research and for practice

In this paper we have sought to understand the reasons behind the investment and innovation decisions of a group of palm oil smallholders in Sabah. The remoteness of this region poses special challenges for researchers in the West or even in the more developed regions of Malaysia: there are cultural, linguistic and geographical barriers to be overcome if we wish to hear the voices of these individuals. Using neo-institutional theory as a guiding framework has helped us to recognise the existence of micro-communities and multiple institutional logics within the population under study, and also, incidentally, to understand our own biases, motives, and practices when working with this particular community. Our study has highlighted the difficulties for researchers working with rural smallholders in marginal regions, and the importance of focusing on the processes of engagement, at emotional, linguistic and contextual levels both in the data-gathering and analysis stages. There were frequent occasions in which previously unrecognized biases and assumptions were brought face-to-face with different perspectives and values.

In identifying these findings we are contributing to an academic conversation exploring the politics of local interaction (including processes of exclusion and marginalization) that affect farmers' access to and engagement with users upstream in the palm oil production chain and with development policy initiatives. Our findings strengthen our understanding of palm oil smallholder behaviour in identifying some blockages in the institutional stream relating to the implementation of organic or sustainable food production methods. Our interviewees were pretty much universally not interested, or much aware of, the sorts of concerns that matter to some Western consumers of palm oil or outreach officers from NGOs and the Malaysian government.

Partly this appears to stem from strongly institutionalised logics to prefer local interactions, with mills for example, to distrust the government or any agency that has a quasi-governmental feel to it. Thus the power of millers is strong, despite our (as researchers) surprise that they should be recipients of such unquestioning faith. Why this should be so is a question for further research. However, our interpretation of this institution is that this has had deleterious, unintended, consequences in blocking any competitive market forces and therefore incentives to improve yields

and farming methodologies.

Lack of awareness of alternatives was also discernible in the smallholders' lack of knowledge about, and therefore investment in, more sustainable or innovative methods. Pusat TUNAS officers are currently trying to engage independent smallholders in a process of innovation for sustainability using RSPO principles (Abas et al, 2010; Pemandu, 2012). The RSPO growth model discourages rainforest clearance and encourages established industry players to increase output and incomes by replanting improved materials on existing palm oil land, while adopting new technologies and ways of working to minimize carbon emissions and promote biodiversity. However, their task of interestment and enrolment (Akrich et al., 2002a, 2002b; Callon, 1986) appears to be encountering at best indifference, ; very little was known about the Pusat TUNAS model among our respondents.

Our findings provides some answers to this; Sabahan smallholders clearly have different priorities and interests. In the case of the hybrids these focused on their other activities. Thus, although they were for the most part more knowledgeable about different farming methods, they lacked the will or time to apply this to their own farms. Any improvements that could be made by the specialists' with their greater focus on investing in their farms was hindered by their lack of knowledge. One puzzling question that our data did not answer and that would benefit from further research, is why the hybrids are choosing to invest in farms that they cannot, or will not, manage properly. In some cases they are even adding to an existing holding. We presume that there is income to be made even given little effort, but not enough income to make the hybrids feel that it is worth giving up their 'day jobs'.

Malaysia is a transitional economy. In this context, it makes sense to explore multiple opportunities simultaneously. Experience and the socio-political environment had not encouraged the hybrid entrepreneurs in our cohort to risk committing wholeheartedly to palm oil production (Thien, 2008; McCarthy and Cramb, 2009). There is also evidence that new investment is flowing into the Sabahan palm oil industry from urban employees seeking to invest their savings in ways that can establish ownership of land. This links to the strongly family oriented culture and the desire to produce something lasting for children to inherit. It may also be a way of attempting to mitigate against the unclear land ownership regulatory environment. Although these questions remain to be answered, an implication is that farmland is being taken up and managed ineffectively by people who have no real current interest in making economic use of the land.

Our findings have policy implications for organisation seeking to engage with these

two types of smallholder, in that any single 'one size fits all' solution is likely to address neither group effectively. We have identified strongly embedded local ties accompanied by low levels of embeddedness in the palm oil industry's wider field. Institutionalised beliefs and differences between formal agencies and their outreach workers and the smallholders was made difficult not only because of geographical distance but because of the lack of awareness of the likely responses within the localised network (Ponds et al., 2007). One consequence is that the government-linked trading organisation PPK is locally being run in a way which dis-incentivises investment in better farming methods. There need to be changes to the grading and pricing processes, which would reward farmers who produce better fruit and in more sustainable ways. Currently the incentives are not there. This is a problem also if organic certification is to be achieved; the mills cannot be certified unless all the participants in the supply chain can themselves be certified. At the moment none of the certification processes are in place.

The issues explored in this paper are of relevance not only to smallholders and policy-makers in Malaysia but also to managers working in NGOs and international organizations like the World Bank and the FAO, and finally to supply chain managers concerned to support environmentally and socially sustainable practices in regions remote from Western consumption (Burton and Paragahawewa, 2011).

Supermarket chains and other major buyers are increasingly seeking evidence of sustainable production within their long global supply chains (Ehrgott et al., 2011). A failure to understand the different behaviours of hybrid or specialist producers may result in unclear or poor government communication strategies that focus inappropriately on certain indicators and procedures without acknowledging the different priorities of those operating in an informal or weakly-regulated economy, and without understanding that a poorly educated workforce lacks the knowledge to be able to judge the value of initiatives that may be self-evident to others from different institutional backgrounds. Our research has surfaced the possibility that the RSPO sustainability model may be poorly designed to appeal to smallholders.

Developed by large corporations in association with equally large NGOs and with government encouragement (especially in Malaysia), the RSPO model is essentially productivist in approach and does not address the cultural or production needs of Sabahan smallholders. The small scale and portfolio entrepreneurship characteristic of Sabah palm oil production implies that discourses of conservation are unlikely to resonate with smallholders (Doolittle, 2005, 2007; Dove, 2011; Dove, et al., 2011).

REFERENCES

- Abas, R., Arif, M.S., Ramli, A., Adzmi, H. , 2010. A study on the perceptions of the supervised fertilizer cluster (KBT) members in the KBT programme. *Oil Palm Industry Economic Journal* 10, 14-25.
- Adderley, S., Mellor, D., 2014. Who's influencing whom? Developing sustainable business partnerships. *EuroMed Journal of Business*, 9, 60-74.
- Akrich, M., Callon, M., Latour, B., 2002a. The key to success in innovation Part I: the art of interessement. *International Journal of Innovation Management* 6, 187-206.
- Akrich, M., Callon, M., Latour, B., 2002b. The key to success in innovation Part II: the art of choosing good spokespersons. *International Journal of Innovation Management* 6, 207-225.
- Author 1, 2004.
- Author 2 et al, 2010.
- Author 4, 2014.
- Ayat, K.A.R., Ramli, A. Arif, M.S., Faizah, M.S., 2009. Management of the Malaysian oil palm supply chain: the role of FFB dealers. *Oil Palm Industry Economic Journal* 9, 20-28.
- Baskett, J.P.C., Jacquemard, J.C., Durand-Gasselín, T., Suryana, E., Zaelanie, H., Dermawan, E., 2008. Planting material as key input for sustainable palm oil. *Journal of Oil Palm Research*, 20 (October Special Issue), 102-114.
- Bell, M. (2007). Technological learning and the development of production and innovative capacities in the industry and infrastructure sectors of the least developed countries: What roles for ODA. UNCTAD Division for Africa, Least Developed Countries Specialised Programme, Brighton, Science Policy research.
- Boschma, R., 2005. Proximity and innovation: a critical assessment. *Regional Studies* 39, 61-74.
- Bourdieu, P., 1991. *Language and Symbolic Power*. Harvard University Press, Cambridge, MA.
- Brandstätter, H., 2011. Personality aspects of entrepreneurship: a look at five meta-analyses. *Personality and Individual Differences* 51, 222-230.
- Burke, A. E., FitzRoy, F. E., Nolan, M.A., 2008. What makes a die-hard entrepreneur? Beyond the 'employee or entrepreneur' dichotomy. *Small Business Economics* 31, 93-115.
- Burmeister-Lamp, K., Lévesque, M., Schade, C., 2012. Are entrepreneurs influenced by risk attitude, regulatory focus or both? An experiment on entrepreneurs' time allocation. *Journal of Business Venturing* 27, 456-476.
- Burton, R. J., Paragahawewa, U. H. (2011). Creating culturally sustainable agri-environmental schemes. *Journal of Rural Studies*, 27(1), 95-104.
- Callon, M., 1986. Some elements of a sociology of translation: domestication of the scallops and the fishermen of St Brieuc Bay. In: Law, J. (Ed.), *Power, action and belief: a new sociology of knowledge?* Routledge, London, 196-223.
- Campbell, J. L., 2006. Institutional analysis and the paradox of corporate social responsibility. *American Behavioural Scientist* 49, 925-938.

Campbell, J. L., 2007. Why would corporations behave in socially responsible ways? An institutional theory of corporate social responsibility. *Academy of Management Review* 32, 946-967.

Carney, M., Andriessse, E., 2014. Malaysia: personal capitalism. In: Witt, M.A., Redding, G. (Eds.), *The Oxford Handbook of Asian Business Systems*. Oxford University Press, Oxford, pp. 144-168.

Casper, S., 2010. The comparative institutional analysis of innovation: from industrial policy to the knowledge economy. In: Morgan, G., Campbell, J.L., Crouch, C., Pedersen, O.K., Whitley, R., (Eds.), *The Oxford Handbook of Comparative Institutional Analysis*. Oxford University Press, Oxford, pp. 335-362.

Cooke, F. M. (Ed.), 2006. *State, Communities and Forests in Contemporary Borneo*. Australian National University E-Press, Canberra.

Cooke, F. M., 2009. In situ off-farm work in the transport industry among oil palm smallholders in Sabah: Negotiating the borders of licit and illegal activities. *Asia Pacific Viewpoint* 50, 43-57.

Cooke, F. M., 2012. In the name of poverty alleviation: experiments with oil palm smallholders and customary land in Sabah, Malaysia. *Asia Pacific Viewpoint* 53, 240-253.

Corley, R. H. V., 2009. How much palm oil do we need? *Environmental Science & Policy* 12, 134-139.

Dacin, M. T., Goodstein, J., Scott, W. R., 2002. Institutional theory and institutional change: introduction to the special research forum. *Academy of Management Journal* 45, 45–57.

Daily Express, 2009. Lip service by palm oil mills. From: <http://naturealert.blogspot.co.uk/2009/08/lip-service-by-palm-oil-mills.html> retrieved July 24 2013

Daily Express, 2010. No specific clause in Sabah Land Ordinance to deal with fraud. From: <http://groups.yahoo.com/group/beritamalaysia/message/112010>. Retrieved 26 January 2013.

Danse, M. and Vellema, S., 2005. Small-scale farmer access to international agri-food chains: a BOP-based reflection on the need for socially-embedded innovation in the coffee and flower sector. *Greener Management International* 51, 39-52.

Dawson, I.K., Leakey, R., Clement, C.R., Weber, J.C., Cornelius, J.P., Roshetko, J.M., Vincenti, B., Kalinganire, A., Tchoundjeu, Z., Masters, E., Jamnadass, R., 2014. The management of tree genetic resources and the livelihoods of rural communities in the tropics: non-timber forest products, smallholder agroforestry practices and tree commodity crops. *Forest Ecology and Management*, in press, <http://dx.doi.org/10.1016/j.foreco.2014.01.021>. Retrieved 30 October 2014.

Delmestri, G., 2009. Institutional streams, logics and fields. *Research in the Sociology of Organizations*, 27: Special Issue on Institutions and Ideology, 115-144.

Dhanaraj, C., Khanna, T., 2011. Transforming mental models on emerging markets. *Academy of Management Learning and Education* 10, 684-701.

Doolittle, A. A., 2005. *Property and Politics in Sabah, Malaysia: Native Struggles over Land Rights*. University of Washington Press, Seattle.

Doolittle, A. A., 2007. Native land tenure, conservation, and development in a pseudo-democracy: Sabah, Malaysia. *Journal of Peasant Studies* 34, 474-497.

Dove, M. R., 2011. *The Banana Tree at the Gate: A History of Marginal Peoples and Global Markets in Borneo*. Yale University Press, New Haven and London.

Dove, M. R., Sajise, P.E., Doolittle, A. A. (Eds.), 2011. *Beyond the Sacred Forest: Complicating Conservation in Southeast Asia*. Duke University Press, Durham, NC, and London.

Ehrgott, M., Reimann, F., Kaufmann, L., Carter, C.R., 2011. Social sustainability in selecting emerging economy suppliers. *Journal of Business Ethics* 98, 99-119.

Emirbayer, M., Mische, A., 1998. What is agency? *American Journal of Sociology*, 103, 962-1023.

Feintrenie, L., Schwarze, S., Levang., P., 2010. Are local people conservationists? Analysis of transition dynamics from agroforests to monoculture plantations in Indonesia. *Ecology and Society* 15(4), 37-51.

Folta, T. B., Delmar, F., Wennberg, K., 2010. Hybrid entrepreneurship. *Management Science* 56: 253-269.

Grabher, G., 2002. Cool projects, boring institutions: temporary collaboration in social context. *Regional Studies* 36 (3), 205-214.

Granovetter, M., 1985. Economic action and social structure: the problem of embeddedness. *American Journal of Sociology* 91, 481–510.

http://www.greenpalm.org/upload/files/253/Palm_Oil_Smallholder_Livelihoods.pdf

Greenpeace, 2007. How the palm oil industry is cooking the climate. From: <http://www.greenpeace.org.uk/files/pdfs/forests>. Retrieved 19 April 2011.

Hall, D., Hirsch, P., Li, T. M., 2011. *Powers of exclusion: land dilemmas in Southeast Asia*. National University of Singapore Press, Singapore.

Hodgson, G.M., 2006. What are institutions? *Journal of Economic Issues* XL , 1-25.

Hoskisson, R.E., Wright, M., Filatotchev, I., Peng, M.W., 2013. Emerging Multinationals from mid-range economies: the influence of institutions and factor markets. *Journal of Management Studies* 50 (7), 1295-1321.

ICZM Project, 1998. *Integrated Coastal Zone Management Project, Sabah Town and Regional Planning Department, ICZM Spatial Plan, Section 6: Natural Resources*. From: <http://www.townplanning.sabah.gov.my/iczm/Reports/Spatial%20Plan/mst-NATURAL.html> Retrieved 1 Dec 2014.

Index Mundi, 2012. From: <http://www.indexmundi.com/agriculture/?commodity=palm-oil&graph=production>. Retrieved 15 Jan 2013.

Jackson, G., 2010. Actors and institutions. In: Morgan, G., Campbell, J.L., Crouch, C., Pedersen, O.K., Whitley, R., (Eds.), *The Oxford Handbook of Comparative Institutional Analysis*. Oxford University Press, Oxford, pp. 63-86.

Jackson, P., Ward, N., Russell, P., 2006. Mobilizing the commodity chain concept in the politics of food and farming. *Journal of Rural Studies* 22, 129–141.

Jalani, B.S., Yusof, B., Ariffin, D., Chan, K.W. and Rajanaidu, N., 2002. Prospects of elevating national oil palm productivity: a Malaysian perspective. *Oil Palm Industry Economic Journal* 2, 1-9.

Jerneck, A., Olsson, L., 2013. More than trees! Understanding the agroforestry

- adoption gap in subsistence agriculture: insights from narrative walks in Kenya. *Journal of Rural Studies* 32, 114-125.
- Kasozi, A.S., 2008. The Role and Influence of Institutions in Economic Development in Uganda: Evidence and Insights from the Development of the Uganda Coffee Sector: 1900-2004. PhD Thesis, University of Hertfordshire. From: <https://uhra.herts.ac.uk/bitstream/handle/2299/2931/Anthony%20Kasozi%20PhD%202008%20-%20Final%20as%20Hard%20Bound.pdf?sequence=1> Retrieved 21 July 2014.
- Kitchen, L., & Marsden, T., 2009. Creating Sustainable Rural Development through Stimulating the Eco-economy: Beyond the Eco-economic Paradox?. *Sociologia Ruralis*, 49(3), 273-294.
- Krippner, G. R., 2001. The elusive market: embeddedness and the paradigm of economic sociology. *Theory and Society* 30, 775-810.
- Levy, D., 2008. Political contestation in global production networks. *Academy of Management Review* 33 (4), 943-963.
- Loo, S. P., 2009. Ethnicity and educational policies in Malaysia and Brunei Darussalam. *SA-eDUC Journal*, 6, 146-57.
- Lundvall, B-Å. (Ed.), 1992. *National Innovation Systems: Towards a Theory of Innovation and Interactive Learning*. Pinter, London.
- Mahmud, A., Rehrig, M., Hills, G. (2010) *Improving the Livelihoods of Palm Oil Smallholders: The Role of the Private Sector*. FSG Social Impact Advisors for the World Bank Group, Washington. From: http://www.fsg.org/Portals/0/Uploads/Documents/PDF/Palm_Oil_Smallholder_Livelihoods.pdf?cpgn=WP%20DL%20-%20Improving%20Livelihoods%20of%20Palm%20Oil%20Smallholders Retrieved 24 July 2013.
- Mair, J., Martí, I., Ventresca, M.J., 2012. Building inclusive markets in rural Bangladesh: how intermediaries work institutional voids. *Academy of Management Journal* 55 (4), 819-850.
- Malaysian Census, 2010. *Population and Housing Census of Malaysia 2010*. Table 27.1: Sabah. From: http://www.statistics.gov.my/portal/download_Population/files/population/05Jadual_Mukim_negeri/Mukim_Sabah.pdf. Retrieved 23 Jan 2013.
- Marsden, T., 2013. From post-productionism to reflexive governance: Contested transitions in securing more sustainable food futures. *Journal of Rural Studies* 29, 123-134
- McCarthy, J. F., Cramb, R.A., 2009. Policy narratives, landholder engagement, and oil palm expansion on the Malaysian and Indonesian frontiers. *The Geographical Journal* 175, 112-123.
- McCarthy, J. F., Gillespie, P., Zen, Z., 2012. Swimming upstream: local Indonesian production networks in “globalized” palm oil production. *World Development* 40, 555-569.
- McMorrow, J., Talip, M.A., 2001. Decline of forest area in Sabah, Malaysia: relationship to state policies, land code and land capability. *Global Environmental*

Change 11, 217-230.

Moir, L., 2001. What do we mean by corporate social responsibility? *Corporate Governance* 1 (2), 16-22.

Morris, C. Holloway, L. 2009, Genetic technologies and the transformation of the geographies of UK livestock agriculture: a research agenda. *Progress in Human Geography*, 33:3, 313-333.

Morrison, A., Pietrobelli, C., Rabellotti, R. (2008). Global value chains and technological capabilities: a framework to study learning and innovation in developing countries. *Oxford Development Studies*, 36(1), 39-58.

Moyer, W., Josling, T. (Eds.), 2002. *Agricultural Policy Reform: Politics and Process in the EU and US in the 1990s*. Ashgate, Aldershot.

MPOB, 2013. Economic & Industry Development Division: Oil Palm Planted Area By States as at December 2012. From: <http://bepi.mpob.gov.my/index.php/statistics/area/110-area.html> . Retrieved 30 June 2014.

MPOB, 2014. Economic & Industry Development Division: Oil Palm Planted Area By States as at December 2013. From: <http://bepi.mpob.gov.my/index.php/statistics/area/114-area-2013/639-oil-palm-planted-area-dec-2013.html> . Retrieved 30 June 2014.

Murdoch, J., Marsden, T., Banks, J., 2000. Quality, nature, and embeddedness. *Economic Geography* 76 (2), 107-25.

Nordberg, D., 2011. *Corporate Governance: Principles and Issues*. Sage, London.

North, D. C., 1994. Economic performance through time. *American Economic Review* 84, 358-368.

Norwana, A.A.B.D., Kunjappan, R., Chin, M., Schoneveld, G., Potter, L. Andriani, R., 2011. *The Local Impacts of Oil Palm Expansion in Malaysia: An Assessment Based on a Case Study in Sabah State*. Centre for International Forestry Research, Bogor, Indonesia, Working Paper 78. From: http://www.cifor.org/publications/pdf_files/WPapers/WP-78Andriani.pdf Retrieved 24 July 2013.

Otsuki, K., 2013. Ecological rationality and environmental governance on the agrarian frontier: the role of religion in the Brazilian Amazon. *Journal of Rural Studies* 32, 411-419.

PACOS Trust, 2008. *Securing indigenous peoples' rights in conservation: reviewing and promoting progress in Sabah, Malaysia*. PACOS Trust, Penampang, Sabah. From:

<http://www.forestpeoples.org/sites/f/files/publication/2010/04/wccmalaysiapareviewwkgdftsept08eng.pdf>. Retrieved 17 April 2012.

Patton, M. Q., 2005. *Qualitative research*. John Wiley & Sons, Ltd.

Pemandu, 2012. Malaysian Government's Performance Management and Delivery Unit. *Economic Transformation Programme Handbook: A Roadmap for Malaysia*. Chapter 9. From

http://etp.pemandu.gov.my/upload/etp_handbook_chapter_9_palm_oil.pdf. Retrieved 8 June 2012.

- Pfund, J.-L., Watts, J.D., Boissiere, M., Boucard, A., Bullock, R.M., Ekadinata, A., Dewi, S., Feintrenie, L., Levang, P., Rantala, S., Sheil, D., Sunderland, T.C.H., Utrecht, Z.L., 2011. Understanding and integrating local perceptions of trees and forests into incentives for sustainable landscape management. *Environmental Management* 48, 334-349.
- Pinkse, J., Kolk, A., 2012. Research note: multinational enterprises and climate change: exploring institutional failures and embeddedness. *Journal of International Business Studies* 43, 332-341.
- Ponds, R., Van Oort, F., Frenken, K., 2007. The geographical and institutional proximity of research collaboration. *Papers in Regional Science*. 86, 423-443.
- Powell, W. W., DiMaggio, P. J. (Eds.), 1991. *The New Institutionalism in Organizational Analysis*. University of Chicago Press, Chicago.
- Pritchard, B., Burch, D., Lawrence, G., 2007. Neither 'family' nor 'corporate' farming: Australian tomato growers as farm family entrepreneurs. *Journal of Rural Studies* 23, 75-87.
- Pye, O., Bhattacharya, J., 2013. *The Palm Oil Controversy in South East Asia: A Transnational Perspective*. Institute of South East Asian Studies, Singapore.
- Rahman, A., Abdullah, R., Shariff, F. M., Simeh, M. O., 2008. The Malaysian palm oil supply chain: the role of the independent smallholder. *Oil Palm Industry Economic Journal* 8, 17-27.
- Régner, P. and Edman, J., 2014. MNE institutional advantage: how subunits shape, transpose and evade host country institutions. *Journal of International Business Studies* 45 (3), 275-302.
- Reid, A., 1997. Endangered identity: Kadazan or Dusun in Sabah (East Malaysia). *Journal of Southeast Asian Studies* 28, 120-136.
- Reinecke, J., Von Hagen, O., Manning, S. (2011). Palm oil under discussion: the pros and cons of an agricultural raw material in sustainable food production. *Moderne Ernährung Heute*, Official Journal of the Food Chemistry Institute of the Association of the German Confectionery Industry, 1-16.
- Ruf, F., 2011. The myth of complex cocoa agroforests: the case of Ghana. *Human Ecology* 39, 373-388.
- Scott, W. R., 1987. The adolescence of institutional theory. *Administrative Science Quarterly* 32, 493-511.
- Scott, W. R., 2008. *Institutions and Organizations: Ideas and Interests*. Sage, London.
- Selznick, P., 1996. Institutionalism "Old" and "New". *Administrative Science Quarterly* 41, 270—277.
- Skerratt, S., 2013. Enhancing the analysis of rural community resilience: Evidence from community land ownership. *Journal of Rural Studies* 31, 36-46.
- Stewart, W. H., Jr., Roth, P. L., 2007. A meta-analysis of achievement motivation: differences between entrepreneurs and managers. *Journal of Small Business Management* 45, 401–421.
- Sturgeon, J. C., 2010. Governing minorities and development in Xishuangbanna, China: Akha and Dai rubber farmers as entrepreneurs. *Geoforum* 41, 318-328.

Teoh, C. H., 2010. Key sustainability issues in the palm oil sector: a discussion paper for multi-stakeholders consultations. International Finance Corporation, World Bank Group, Washington. From: http://siteresources.worldbank.org/INTINDONESIA/Resources/226271-1170911056314/Discussion.Paper_palmoil.pdf. Retrieved 24 July 2013.

Terluin, I. J., 2003. Differences in economic development in rural regions of advanced countries: an overview and critical analysis of theories. *Journal of Rural Studies* 19, 327–344.

Then, S., 2009. Borneo natives in stand-off with oil-palm giant. *The Star*, 6 November. From: <http://thestar.com.my/news/story.asp?file=/2009/11/6/nation/20091106204350&sec=nation>. Retrieved 22 February 2012.

Thien, T., 2008. Land rights: Sabah natives submit memo. *Malaysiakini*, 23 February. From: <http://www.malaysiakini.com/news/78478> Retrieved 24 July 2013.

Thornton, P. H., Ocasio, W., Lounsbury, M., 2012. The institutional logics perspective: A new approach to culture, structure, and process. Oxford: Oxford University Press.

Tolbert, P. S., Zucker, L. G., 1996. The institutionalization of institutional theory. In: Clegg, S., Hardy, C., Nord, W. (Eds.), *Handbook of Organization Studies* (pp. 175-190). London: Sage.

Tonoyan, V., Strohmeier, R., Habib, M., Perlitz, M., 2010, Corruption and entrepreneurship: how formal and informal institutions shape small firm behavior in transition and mature market economies. *Entrepreneurship Theory and Practice* 34, 803–831.

Tscharntke, T., Clough, Y., Wanger, T.C., Jackson, L., Motzke, I., Perfecto, I., Vandermeer, J., Whitbread, A., 2012. Global food security, biodiversity conservation and the future of agricultural intensification. *Biological Conservation* 151, 53-59.

Tucker, H., 2010. Peasant-entrepreneurs: A longitudinal ethnography. *Annals of Tourism Research* 37, 927-946.

Vermeulen, S., Goad, N., 2006. Towards better practice in smallholder palm oil production. *Natural Resource Issues Series*, no. 5. International Institute for Environment and Development, London.

Vermeulen, S., Cotula, L., 2010. Making the most of agricultural investment: a survey of business models that provide opportunities for smallholders. Food and Agricultural Organization of the United Nations and International Institute for Environment and Development, Rome. From: http://www.ifad.org/pub/land/agri_investment.pdf. Retrieved 19 April 2011.

Wicke, B., Sikkema, R., Dornburg, V., Faaij, A., 2011. Exploring land use changes and the role of palm oil production in Indonesia and Malaysia. *Land Use Policy* 28, 193-206.

Williamson, O. E., 1981. The economics of organization: the transaction cost approach. *The American Journal of Sociology* 87, 548–577.

Winn, M.L., Angell, L.C., 2000. Towards a process model of corporate greening. *Organization Studies* 21, 1119-1147.

Wright, M., Filatotchev, I., Hoskisson, R. E., Peng, M. W., 2005. Strategy research in emerging economies: challenging the conventional wisdom. *Journal of Management Studies* 42, 1-33.

Woods, M., 2007. Engaging the global countryside: globalization, hybridity and the reconstitution of rural place. *Progress in Human Geography*, 31(4), pp. 485-507.

Xu, D., Meyer, K.E., 2013. Linking theory and context: 'Strategy research in emerging economies' after Wright et al (2005). *Journal of Management Studies* 50 (7), 1322-1346.

Zucker, L. G., 1987. Institutional theories of organizations. *Annual Review of Sociology* 13, 443– 464.



Figure 1
Sabah, Malaysia (Source Google Maps, 2013)

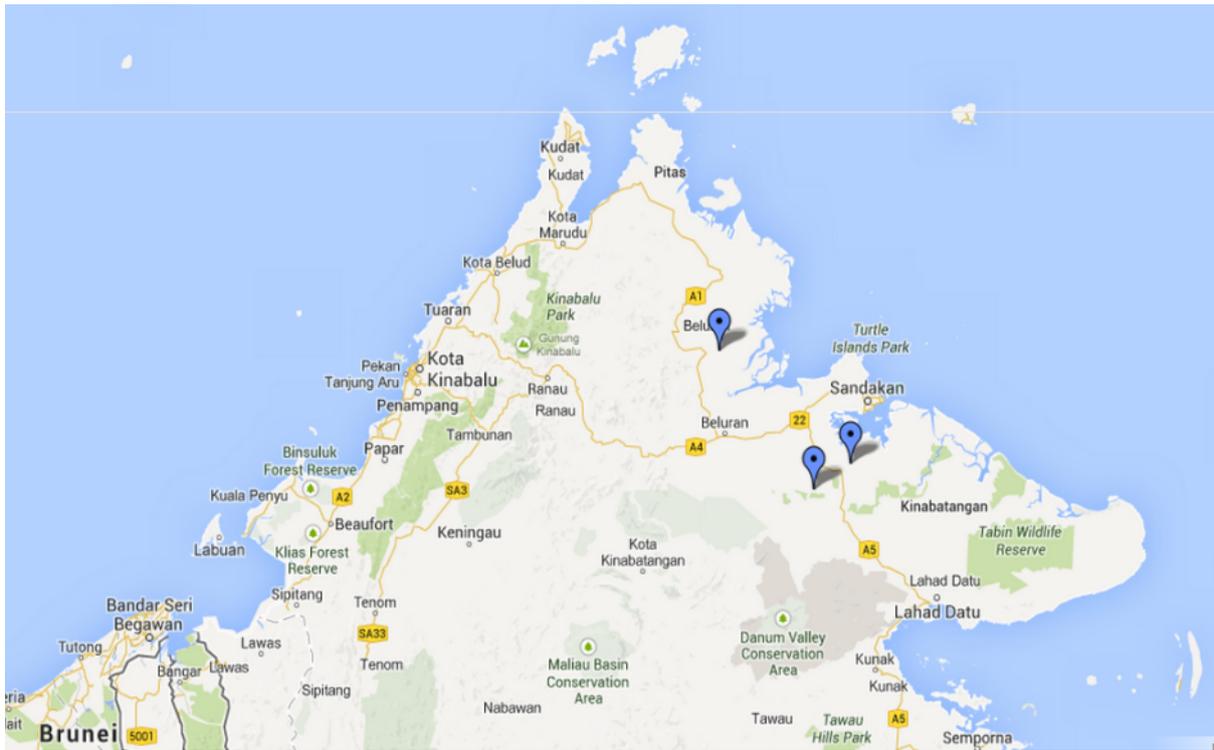


Figure 2
The Sabahan location of palm oil smallholders in our sample

Table 1
Summary of Findings

Institutional Context	Hybrid entrepreneurs n = 16	Specialist smallholders n = 18
Acreage	Range between 2 acres and 70 acres; mean size 15 acres	Range between 2 acres and 23 acres; mean size 11 acres
Land title	Problems in obtaining official land ownership title	Problems in obtaining official land ownership title
Access to capital	Three respondents had obtained bank loans although a further one had tried and failed to do so. Preference for self funding No mention of borrowing from millers	One had obtained a bank loan in the distant past. None had current bank loans. Preference for self funding One had obtained short-term credit from Dinar mill; another had tried and failed to do so.
Access to other resources	Seven (44%) employ some wage labour, typically one or two people Limited additional support for harvesting from contractors Six own trucks to transport fresh fruit bunches to millers Nine rent space on trucks	Eight (44%) employ some wage labour, typically one or two people Limited additional support for harvesting from contractors Three own trucks to transport fresh fruit bunches to millers Thirteen rent space on trucks
Personal characteristics		
Education	All had some formal education. Six were qualified to primary education level (leaving at 11 years old). Seven were educated to secondary school level (age 17 or 18). Three had qualifications at college level or above. A number had had some work experience (and therefore training) in government jobs or palm oil manufacturing facilities.	Seven had had no formal education. Three had been educated at primary level. Three were qualified to secondary education level. This was not correlated with gender, although it tended to be correlated with age.
Age	Younger on average: Three are in their 20's; three in 30's; two in 40's; three in 50's; four in 60's and one in his 70's.	Older on average: Three are in their 30's; two in 40's; seven in 50's; four in 60's and two in their 70's.
Gender	13 male and 3 female	10 male and 8 female.
Ethnicity	Nine are Orang Sungai, four are Kadazan Dusun, two are Sinor Kadazan (Chinese Dusun Heritage) and one Indonesian.	Diverse: Twelve are Orang Sungai; one each of Dusun, Bajau, Kadazan, Chinese, a mixed heritage of Orang Sungai and Kadazan, and Bugis (migrant).
Relationships with Millers: Linkages to supply chain	10 play the field 6 are loyal Simbolik (1) – the respondent valued this mill for its close proximity to his farm Malsa (3) – no reasons given Dinar Harapan (2) – prompt cash payment, fair price	Five play the field Two did not care where they sold to, and said this depended on the destination of the truck on which they rented space 11 are loyal Peladang -3 – family relationship to miller and fair pricing Malsa - 4 - fair grading and proximity

Dinar - 4 - family relationship to miller and fair grading

Attitudes to investment

none	expansion	improvement	reducing	investing off farm
10	1	1	1	3
62.5	6.3%	6.3%	6.3%	18.8%

none	expansion	improvement	reducing	investing off farm
8	7	1	2	0
44.4	38.9	5.6	11.1	0 %

Attitudes to sustainability

Aware but not engaging	Taking some action	Not interested
2 are not engaging with sustainability initiatives on grounds of cost. One was well informed but disillusioned about 'improved' planting materials.	One has a glimmering awareness of climate change, and uses a mixture of fertilizer types	The majority
3	3	10
18.75%	18.75%	62.5%

Aware but not engaging	Taking some action	Not interested
7	0	11
38.9%	0.0%	61.1%