

Two islands – two outcomes: food, fruit, and fuel in multi-contractual farming supported by the tobacco industry

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The contract farming of seasonal crops raises the question of how farmers can be supported when they are not producing the contracted crop. Farmer incomes and relationships between company and farmers can be enhanced if the company can provide additional income-earning opportunities. This approach is particularly pertinent in those developing countries where management, technical, and marketing linkages are weak. In addition, many farming communities have little access to short-term finance to fund their cropping cycle, apart from sometimes avaricious money lenders. The specific focus of this study is to introduce the recent experiences of five multi-contractual projects sponsored by two tobacco organizations: PT Sadhana Arifnusa Corporation (Sadhana) in Indonesia and the Southern Development Company (SDC) in Fiji. As tobacco is a six-month crop, both companies considered that broadening their cropping base during the 'off season' would provide additional income for their farmers. It would also offer additional employment to seasonal workers who are employed only during the delivery, processing, packing, and storage of crops. The outcomes of this paper can act as a template for a detailed analysis that can determine the successes and constraints of multi-cropping under contract, and the promotion of farmer-company relations, including how they can restrict side-selling, a major constraint of contract farming.

Keywords: Indonesia, Fiji, tobacco, maize, rice, papaya, diversification, forestry

CONTRACT FARMING SYSTEMS HAVE become an increasingly important feature of global agribusiness. To improve ever-increasing consumer demand for quality, food, and coordination, a 'tighter alignment in supply chains' is needed (Da Silva, 2005). This is particularly true in developing countries where contract farming is centred on smallholder farmers cultivating small plots of land. The majority of the developing world's farmers have limited access to credit and new agronomic technology, have a poor understanding of markets, and, in some instances, have limited land to cultivate (Eaton and Shepherd, 2001). In the past few decades, the large estate model for tobacco production in Malawi, a legacy of colonial times, has given way to

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small-scale farmer production with many farmers under contract (Harrigan, 2003). This transformation has increased the responsibility of tobacco manufacturing companies to initiate and manage the transactions of change when organizing and transferring skills to, possibly, many thousands of farmers cultivating tobacco within a single project. Currently, most tobacco companies in the developing world source their raw tobacco from contracted farmers, the majority of whom cultivate between 0.1 and 2 hectares.

Background to tobacco in Lombok, Indonesia

Indonesia is the world's seventh largest producer of tobacco. Introduced by Dutch colonialists in the 17th century, the crop has expanded throughout the country. On the island of Lombok (8°S) tobacco cultivation has been increasing since the early 1990s. Conditions are suitable for the production of a 'flavoured' Virginian style tobacco to replace expensive imported tobacco. The island has a population of over 3.1 million living on a total land mass of 4,700 km². It has semi-temperate highlands of over 1,000 m, dominated by the sacred volcano, Mount Rinjani (3,700 m). Lombok is a part of Nusa Tenggara Barat (NTB) province, and has a predominantly rice-based rural economy with a fast-growing tourist industry. Population pressure and division of land makes it increasingly expensive to rent. The majority of farmers own <0.35 ha so they hire extra land for their cropping requirements.

Simmons et al. (2005) wrote that the contract farming of tobacco in Lombok allowed tobacco companies to lower costs while offering their farmers markets, technical services, and material inputs. The net effect of contract farming on Lombok's farmers has been controversial because farmers often have to rent land in order to cultivate a sufficient quantity (around 1 ha) to make investment in a curing barn a paying proposition. This can make rented land unaffordable for non-tobacco farmers. Tobacco in Lombok has also provoked other socio-economic changes both outside and within the household. The availability of wage employment and the dependence on cash intensified the stratification of households. Patrick (2004) noted that contract farming in Lombok has become particularly 'propitious' as a large population of landless labourers became a source of cheap labour. Amigo (2010), also commenting on Lombok's tobacco industry, has written that the availability of cash and paid work during the tobacco season, which coincides with the dry season from April to October, is a significant feature of the industry. However, so are dependence on a cash economy and the increased engagement in market-based consumption. Lack of work and money characterize the rest of the year. Tobacco farming has improved the living standards of entrepreneurial smallholders, but not those of the poor and landless. Undeniably, tobacco cultivation has deeply penetrated the economy of the island and some areas of East Lombok have become highly dependent on the crop.

PT Sadhana Arifnusa Corporation (Sadhana) is a major Indonesian-owned tobacco merchant company. The company grows tobacco under contract by smallholder farmers throughout the country. Sadhana commenced its Lombok tobacco operations in 1994 and in the following year contracted out its tobacco

cultivation activities to individual farmers. Apart from suitable soils, climate, topography, and water for irrigation, tobacco requires the coordination of intense management and labour inputs for a six-month growing season. The company selected farmers using the criteria of land holding or access to rented land, farming experience, adequate water for irrigation, and labour resources. Its farmers are offered continuous training, financial and material input advances, and constant technical advice by company staff.

In 2013, the company had 1,674 farmers on Lombok contracted to grow a target of 3,000 ha of Virginia tobacco. Farmer numbers and quotas vary from year to year and are subject to the cigarette manufacturers' annual requirements and the ability of landless farmers to access land. Annual quotas are also influenced by the strength of the Indonesian Rupiah and manufacturers' stocks. Individual farmer quotas depend on past performance, particularly on whether the farmers have conducted illicit side-selling to other tobacco buyers. The practice of side-selling of tobacco was confirmed by Eaton (co-author) in 2006 when he was informed by some Lombok farmers that they randomly sold tobacco to a number of tobacco merchants.

On Lombok alone, Sadhana has 54 university-trained field technicians employed to coordinate and supervise its growers. After harvesting and curing, the tobacco is sold to the company according to its grading specifications and the pricing structure agreed with the farmers before each season commences. Sadhana's extension staff annually monitors each farmer's performance and skills and this determines the quota a farmer is given in the following season. Past performance will also influence the level of inputs the farmer will receive on credit. Farmers can be upgraded or downgraded depending on their ability to follow instructions and provide the quantity and quality of tobacco they were contracted for. All farmers are assessed for their reliability and performance (A–D) and skills (1–4) (see Table 1). Following transplanting, every crop's yields are estimated by extension staff. If there is a marked decrease of estimated production, investigations are made as to the reasons: lack of irrigation, poor cultivation, poor harvesting practices, disease or side-selling.

Table 1 Sadhana's criteria for farmer ratings

<i>Reliability and performance</i>	<i>Skills</i>
A Very reliable	1 Highly skilled/innovative/early adopter
B Reliable	2 Skilled and able to follow recommendations/early adopter
C Average reliability	3 Average skills
D Not reliable, high risk of side selling	4 Difficulty to adapt

Side-selling to other tobacco companies and dealers is an issue of concern on Lombok. Sadhana considers that the NTB Government does little to regulate and control side-selling to transient 'fly-by-night' tobacco dealers. The long-term effects of this diminish the confidence of established, bona fide companies to invest in the island. Lombok is considered to have the potential to grow 80 million kg of quality tobacco yet it presently produces only 36 million kg. Tobacco companies operating on Lombok, including Sadhana, are seeking new areas in Indonesia to grow similar

styles of tobacco because of Lombok's side-selling problems. Tobacco is a difficult and expensive crop to grow but it is profitable if it is efficiently managed. It is also risky, particularly if it rains during the dry season. Table 2 shows the comparative net return of tobacco, rice, and maize.

Table 2 Comparative net income per ha, Lombok, 2012

	<i>Tobacco</i>	<i>Rice</i>	<i>Maize</i>
Estimated net income US\$/ha	3,000 +	1,200–1,500	1,000–1,500
Estimated cost of production US\$/ha	4,000	500	500

Source: Sadhana Corp., unpublished company records, 2011–2013; NTB government

Although Sadhana advances inputs and cash to its tobacco farmers on credit, it charges interest at commercial bank levels. The advances given are not usually sufficient to cover all expenses. One problem is that if farmers default on their company debt, they are often de-registered and then have no means to pay off outstanding debts and to finance alternative crops. Alternative cash crops, particularly maize and rice, suffer from low yields due to poor agronomy, inappropriate varieties, and minimal NTB Government extension services. Government-subsidized fertilizer is often delivered too late to be of any benefit. This leaves farmers two choices if they plan to grow crops not under the umbrella of a tobacco company:

- Approach local banks that are not normally geared to provide agricultural loans. Such transactions involve time-consuming bureaucracy, which farmers can ill afford.
- Use village moneylenders, who are commonly called '4 x 6'. A farmer borrows four and gives back six, representing a 50 per cent interest rate. No time frame is specified but payment is usually after the tobacco is sold. Farmers usually pay moneylenders before paying company debt.

Sadhana's diversification programme

Since 2009, Sadhana's corporate policy has been to evolve into a mixed farming model entity, with tobacco comprising only part of an integrated farmer base. Sadhana's management identified the availability of suitable land and the reduction of farm size to plant caused by constant family divisions and the side-selling of tobacco as its major challenges. To address those issues, the company decided to provide advice and inputs to permit its tobacco farmers to diversify into other crops. By increasing production of the farmers' food/cash crops Sadhana's involvement would not only financially benefit its farmers but also cement farmer–company relationships. Sadhana is currently providing input packages (i.e. finance, seed, and technology) for rice, maize, and livestock. The company has also initiated a tree-planting programme to ensure that farmer households and tobacco curing facilities have fuel from a permanent and renewable source. Maize is grown immediately following tobacco and is used for domestic food consumption and animal fodder. Table 3 illustrates the current mixed farming support provided by the company.

Sadhana focuses on rice in rotation with tobacco rather than maize. Maize can have a negative effect on soils and therefore requires more inputs. The company is considering soybeans as another alternative crop.

Table 3 Farmers growing tobacco, rice, and maize under the auspices of Sadhana

<i>Crop</i>	<i>Ha 2011</i>	<i>Farmers 2011</i>	<i>Ha 2012</i>	<i>Farmers 2012</i>
Tobacco	2,700	1,588	1,800	1,100
Rice	150	220	150	200
Maize	70	130	300	566

Source: Sadhana Corp., unpublished company records, 2011–2013

NTB Province and Indonesia in general has a mounting beef shortage, which was recently further exacerbated by an Australian moratorium on beef exports. Sadhana has investigated the possibilities of importing Australian composite bulls to cross with local cattle stock to upgrade the genetics of Lombok's herds. The company is also promoting the spread of nutritious pasture grasses, Sudan rye (*Sorghum sudanense*) and buffel (*Cenchrus ciliaris*), and is investigating composting silage by utilizing rice straw, which is traditionally burnt. If successful, this programme will provide additional livestock fodder. Three case studies are presented in detail to describe Sadhana's current diversification initiatives.

Case study 1: rice rotation

Rice is grown throughout Lombok in the wet season of October to April, and rotated with tobacco in the dry period. In areas with total irrigation, farmers now grow rice continuously; a practice banned under the Suharto regime, 1965–1998. The NTB is supporting rice growing in the Province in line with the national aim to achieve food self-sufficiency. Indonesian yields, at less than 4 t/ha, are poor in comparison with those of China, Thailand, and Vietnam (>9 t/ha). Rice research and new varieties in Indonesia are limited and the country is reliant on the International Rice Research Institute (IRRI) in the Philippines for research data and new varieties. Sadhana's management estimates that its farmers could increase rice yields by more than 30 per cent with the introduction of new varieties and timely provision of inputs. In partnership with Bayer Indonesia, the company introduced the Tabela Rice Planting System to its farmers in 2009. The Tabela System is based on:

- Improved seed varieties.
- Direct sowing which allows the farmer to plant his own crops on time rather than relying on labour or the local *gotong royong* (community) planting system.
- Time saving of approximately two weeks. This allows a crop like maize to be sown directly after tobacco thereby allowing three profitable crops a year, one of tobacco, one of maize, and one of paddy.
- Provision of the right inputs on time and in the correct quantity to achieve higher yields; 30 per cent of farmers have so far achieved yields of over 7 t/ha.
- Labour saving: two people can transplant 1 ha of rice by using the Tabela direct drilling procedure.

In 2012, 150 ha of rice were planted under the system by 200 farmers contracted to Sadhana. The increase in productivity and revenue to the farmers was encouraging. Table 4 highlights a 75 per cent plus increase in rice yields and a 100 per cent plus increase in income.

Table 4 Comparative yields and financial returns for rice, 2012

<i>System</i>	<i>Yield kg/ha</i>	<i>Cost of production US\$/ha</i>	<i>Returns US cents/kg</i>	<i>Gross return US\$/ha</i>	<i>Net return* US\$/ha</i>
Traditional	4,000	525.30	32	1,263.00	736.80
Tabela	7,000	631.60	34	2,358.00	1,726.30

* After deductions for seed, chemical, and cash advances from Sadhana.

Source: Sadhana Corp., unpublished company records, 2011–2013; Lombok Agricultural Department, crop data, 2012

Farmers have been very positive about the approach. They have pointed out that, under this system, they do not qualify for subsidized fertilizer from the government but, even so, it was still more profitable to use the Tabela method with fertilizer supplied by the company than traditional methods with subsidized fertilizer. Sadhana's plan in 2013 was to extend the Tabela system to as many of its tobacco farmers as practical. However, many are constrained by limited access to land and water for irrigation. Ways in which farmers can be supported to rent land on a longer term basis than just one tobacco season are being explored although this may require companies to concentrate on the most able farmers.

Case study 2: wood for fuel

The use of forest and natural thickets as a fuel source for domestic and village-scale industrial fuel use (i.e. for roof tile and lime production) has directly contributed to severe deforestation and degradation of over 234,146 ha of state forest land within the province of NTB. The Province's Forestry Department estimates that approximately 400,000 m³ of fuel wood is illegally logged from state forests annually. The NTB also believes that more than 537 natural water springs have been lost as a direct result of deforestation during the period 1985 to 2009 with only 174 springs remaining useable.

A Wood for Fuel concept was conceived by Sadhana in order to establish a sustainable fuel supply with obvious environmental, social, and economic benefits to local communities, including the company's smallholder tobacco farmers. Sadhana's objective was to establish a managed and sustainable fuelwood industry within NTB that would make a substantial impact on reducing pressure on the remaining forested areas. It would also contribute to the reduction of run-off of rain and restoration of the water table.

Sadhana initiated its Wood for Fuel biomass programme in 2009, in anticipation of the removal of the government's fuel subsidy on kerosene. In the following year, the company established a root-trainer nursery in East Lombok which has produced in excess of 4.5 million tree seedlings. At that time, all Virginia tobacco was cured with

kerosene. It was calculated that the removal of the government subsidy on kerosene would cause a 25 per cent increase in production costs. The kerosene subsidies were eventually withdrawn in 2011. The alternative fuels for tobacco curing were bituminous coal from Kalimantan and local wood. Coal has negative environmental and health consequences when used in curing tobacco, as well as the additional problems of consistency of quality and supply. The curing cost per/ha of tobacco using wood is approximately US\$530/ha versus \$1,000 when using kerosene or coal. The Sadhana Wood for Fuel concept is taking a two-pronged approach:

- A credit-based system to establish a multi-use tree resource base, mainly planted along the walls of rice fields. A fast-growing leguminous tree species, Turi, *Sesbania grandiflora*, was chosen for its site suitability, short three-year rotation, and its good-quality, high-protein foliage. Turi therefore addresses one of the other concerns for smallholder farmers in Lombok which is a shortage of livestock fodder during the dry season. Approximately 21 m³ of Turi wood are used as a curing fuel for 1 ha of Virginia tobacco. During the period 2009–2012 more than 2.5 million tree seedlings were distributed to farmers involved in this programme.
- The second approach has been to establish fuelwood plantations within areas of designated State Forest land. To do this, Sadhana required a tree plantation licence issued by the Indonesian Ministry of Forestry with approval by NTB's Forestry Department. These areas are considered critically degraded forest lands and their 're-greening' in the form of fuelwood plantations will have major positive environmental impacts on important watershed areas.

Despite some government and NGO resistance, by early 2013 Sadhana had established 120 ha of species and silviculture trials, comprising some 20 species and a further 170 ha of plantation within the state forest. The company has formed an agro-forestry division with approximately 100 full-time staff dedicated to its agro-forestry programmes.

Many tobacco farmers rent land for tobacco and, as such, they do not fulfil the criteria for the tree planting programme, which requires undisputed land ownership. Tobacco farmers who are bona fide landowners are provided with either seeds or seedlings of *Sesbania grandiflora* trees and these are planted around the boundaries of their land. The company charges its tobacco farmers for the seedlings at cost, usually added to their tobacco accounts.

Sadhana also participates in a number of community tree planting programmes under the Greening Up banner of the NTB Government. The company provides technical inputs, seedlings, and materials free of charge to a number of organizations for their individual tree planting programmes. The programmes include working with local communities in central Lombok. Sadhana has established 21 trial plots within the community forest of Kabul. These plots have been established in a designated community tree plantation area allocated to the local community by the NTB Government. Community woodlots are planted in anticipation of producing a surplus to current domestic fuelwood requirements, which will be utilized for wood pellet production and biomass power generation within NTB.

The company's integrated agro-forestry programme now involves more than 1,500 farmers. The forecast wood harvest by Sadhana tree farmers in 2013 was over 25,000 m³, providing a saving of \$559,523 compared with alternative fuels. A major challenge is finding land to plant woodlots because of land shortages. There are efforts to foster partnerships between land owners and tobacco farmers, whereby the wood is used for both curing and domestic fuel.

Fuel and food must be considered synonymous. The need for fuelwood in Lombok far exceeds its use for flue-cured Virginia production; it is as vital for rural communities as food itself. *Sebania grandiflora* is a highly versatile legume that provides a high quality livestock forage and green manure. In addition, the pods, flowers, and young leaves of *S. grandiflora* are edible and are a healthy, nutritious meal-supplement used throughout Indonesia and much of South and South-east Asia.

Case study 3: chicken production

Poultry in the form of meat and eggs is a major constituent of the Indonesian diet, particularly throughout the NTB where fish and chicken are the two main protein sources. The national trend is for increasing consumption of chicken meat. Although large-scale, intensive farming of non-Indonesian chicken breeds, or *ayam ras*, for the production of both meat and eggs has become well-established throughout Indonesia, there remains a strong preference for organic chickens or for the traditional breeds of village chicken, *ayam kampung*, particularly for consumption during festivals.

The chicken industry is dominated by three large foreign-owned companies who rely on a contract farmer-based system to source production. While this is a profitable business for the companies supplying day-old chicks (DOC) and their sustenance, the profit margin for the farmers is slim, estimated at \$0.30 per bird. This narrow margin dictates that it only becomes financially attractive to the farmer if the business is conducted on a large scale. It is considered that 2,000 birds per farmer is the minimum that would justify the investment of \$7,000 for a henhouse; a sum beyond the capacity of the majority of Lombok's farmers. The development concept implemented by Sadhana is to use a micro-credit system to provide materials and cash to enable the farmer to farm 200 cross-bred village chickens in a semi-intensive system. This provides a reasonable financial income to the farmer of approximately \$160–250 or \$0.80–1.25 per bird every 8 to 10 weeks. A broad-based comparison, which is commonly used throughout Indonesia, is that semi-intensive farming of 1,000 *ayam kampung* provides an income equivalent to intensively farming 5,000 *ayam ras* or imported commercial meat breeds.

Cross-bred chickens produced by Sadhana farmers, raised in a semi-intensive system with quality feed, produce chickens with a live body weight of 600–900 g at ages 8 to 10 weeks. The birds are sold with a price per bird, not per kilogram, an indication of the market preference for the non-commercial breeds. The normal, non-intensive village 'free-range' *ayam kampung* chickens require seven to nine months to achieve the same live body weight.

The micro-credit loan is paid back to Sadhana over a two-year period, which covers eight rotations of rearing the chickens. The current system is constantly being updated and revised, based on farmer feedback. Ideally, farmers will expand to produce more DOC in each batch as they accumulate money from each harvest and pay cash for additional DOC above the standard 125 provided by Sadhana. With the larger profit margin and the use of a semi-intensive system, there is no need for a large investment in a large henhouse and the high quality feed material provided ensures faster growth and a relatively short rotation period. The system generates a year-long cash flow for the farmer without being reliant on season or weather.

Sadhana has set up a breeding flock and a hatchery along with a feed production facility, which utilizes local agricultural produce, i.e. maize, rice bran, and coconut oil. The programme was started in 2013. The Sadhana production capacity for DOC in 2013 was approximately 1,000 per week and demand for DOC, which developed rapidly, was in excess of 3,000 per week and rising.

Viti Levu, Fiji

Viti Levu (18°S), the largest island in the Fiji group, comprises an area of 10,389 km² and is home to over 600,000 people. The island is more than double Lombok's size but has 20 per cent of the population. Western Viti Levu is the centre of a substantial sugar cane industry and a comparatively smaller Virginia tobacco industry. Similar to Lombok, western Viti Levu is also the centre of a thriving tourist industry.

Background of tobacco in Fiji

Tobacco was introduced to Fiji in the early part of the 19th century, probably by Spanish sailors en route to the Philippines. By 1900, 32 ha of air-cured tobacco were reported to have been cultivated on Viti Levu. Following World War Two, two international tobacco companies invested in manufacturing flue-cured Virginia style cigarettes (Eaton, 1988). In 1985, Southern Development Company (SDC) was contracting 610 farmers to cultivate 188 ha that produced 377,000 kg of tobacco. Although the total quantity was miniscule compared with world production, crop yields were 2005 kg/ha, which was considered above global average. The net return in 1985 for the tobacco farmers was \$1,750/ha against \$483/ha for harvested sugar cane.

Case study 4: maize

In 1986, SDC's mono-crop policy was modified to encourage diversification into alternative crops that offered farmers additional incomes, particularly in the six month off-season. The first diversification venture into maize was so successful that production yields tripled the national average. This was attributed to the insistence on strict coordination of cultivation, transplanting, and harvesting practices recommended by SDC and the introduction of a hybrid variety. The company shelled the raw maize and dried the kernels in its tobacco kilns. After shelling on the

company's premises, the farmers were paid for the 'wet' maize, less the 17.5 per cent moisture content. This allowed farmers to grow at least double the area of maize as their labour cost and effort in husking and drying was eliminated. Extra-contractual sales were controlled by the cancellation of lucrative tobacco contracts of farmers who circumvented the maize contract by side-selling. The contract conditions were:

1. All necessary seed, chemicals, and fertilizer were supplied and charged to the farmer. Costs of pre-sowing cultivation could also be advanced.
2. The pricing formula allowed for a sliding scale, with farmers being paid more per kilogram as their yields increased.
3. Farmers were strictly prohibited from selling maize produced under the agreement to any other buyer without the written consent of the company. Any breach of this agreement would result in farmers forfeiting both their tobacco and maize contracts.
4. Bags were supplied by the company which retained ownership of them.
5. Farmers were paid once their crop had been harvested and sold to the company and all outstanding crop advances deducted.

An advantage for SDC was that the maize project offered seasonal tobacco workers off-season employment. Unfortunately, a company directive in 1989 resulted in the termination of this successful maize project on the basis that it 'interfered with the core focus of the company, that of cultivating tobacco' (T. Casey, personal communication, June 2013, Nadi, Fiji).

Case study 5: papaya

SDC had pioneered the importation of Solo papaya seed (*Carica papaya*) from Hawai'i for commercial use and by the end of 1986 had established a nursery which sold and distributed papaya seedlings to Fiji's farmers and a parastatal body, the National Marketing Authority (NMA). The NMA requested the SDC to manage 10 ha of Solo papaya, marketed as Fiji Red, on its behalf. As part of the arrangement, SDC would transport farmers' fruit to a central buying point then purchase the fruit and supervise the packing undertaken by the NMA.

Accepting NMA's proposal, SDC approached interested tobacco farmers to grow Fiji Red by allocating 0.2–0.4 ha per farmer in an area close to Fiji's international airport and government quarantine facilities. Contracts were signed between the SDC and growers that stipulated the conditions to be observed by NMA as the exporter and SDC as the manager (McGregor, 1990; SDC, 1986–1990, unpublished company records). Farmers could not exceed the allocated area and planting, cultivation, fertilization, and harvesting had to be in accordance with SDC instructions. The company agreed to buy at a designated buying point all exportable fruit of the recommended variety from the quota area, but no other. As with maize, inputs were supplied by the company and charged to the farmers' accounts. Fruit purchase was undertaken by company buyers and graded according to NMA export specifications. Finally, payment was made on a fortnightly basis, with 25 per cent of the gross sales proceeds deducted until the total value of advances had been recovered.

The first export consignments were shipped to Australia using the quarantine treatment of ethyl dibromide (EDB). By 1989, 8 ha of Fiji Red were producing 72,000 kg or 80 per cent of Fiji's total papaya exports. The original target of 10 ha was not achieved due to poor field selection and a cyclone with consequent flooding. Farmers achieved yields of 9,000 kg of exportable papaya per hectare and undersized and blemished fruit were sold by the farmers directly to the local market (McGregor, 1990). The financial return to farmers was estimated at \$2,000 gross per hectare of exportable fruit. It was estimated that these returns could have been doubled with increased fruit size, improved grading, and careful field selection.

From the outset, government quarantine facilities proved erratic, with regular breakdowns. The NMA's involvement soon collapsed, primarily due to internal management problems and a misunderstanding of the logistics needed for a demanding export market. SDC assumed a de facto marketing role for which it had no experience. In 1989 SDC's marketing strategy shifted to supplying new buyers in Australia and these later reneged on their financial obligations (T. Casey, pers. comm., June 2013, Nadi, Fiji). This combination of factors resulted in SDC withdrawing from the industry, which led to reduced farmer interest and farmers selling on the domestic 'cash in hand' market.

A 1990 evaluation of SDC's venture into export papaya production was presented as a production matrix which formally benchmarked responsibility, significance, and performance of 23 key components of the production chain. The matrix, as displayed in Table 5, highlighted the positive and negative performances of all stakeholders: the farmers, NMA, SDC, and government quarantine authorities.



Contracted papaya grower, Fiji

Table 5 Production matrix: Fiji export papaya, 1987–1990 (revised June 2013)

<i>Component</i>	<i>Body responsible</i>	<i>Significance ranking</i>	<i>Achievement ranking</i>
Land/water resources	G/F	C	3
Production financing	SDC	C	3
Pest control	F/SDC	S	2
Seed supply	SDC	I	3
Fertilizer requirements	SDC	S	3
Material inputs	SDC	I	3
Farm machinery	F/SDC	S	3
Irrigation	F/SDC	S	2
Farm energy	G/F	S	3
Inputs and extension	SDC	I	2
Farmer/management forums	F/SDC	C	3
Research	G/NMA/SDC	C	1
Off-shore technology	G/SDC	S	2
Farm labour needs	F	I	3
Transplanting	F	S	3
Field cultivation	F	I	3
Harvesting	F	C	2
Grading – operation	NMA	C	1
Storage/transportation	NMA/SDC	I	2
Packaging	NMA/SDC	C	2
Quarantine treatment	G	C	1
Marketing	NMA/SDC*	C	1

Responsibility: F: Farmer; SDC: Southern Development Company; G: Government; NMA: National Marketing Authority.

Significance: C: Critical; I: Important; S: Significant. Achievement: 3 Good; 2 Average; 1 Poor

*SDC Sole responsibility for marketing from 1988.

Source: adapted from Eaton and Shepherd 2001: 144, Table 6

The matrix's evaluation concluded that the SDC diversification project failed not because of fruit quality, the physical environment, farmer effort, the technology or climatic factors but primarily from erratic public-sector quarantine services and marketing policies, first by the NMA and later by SDC.

Conclusions and recommendations

In Fiji, the experience of SDC and its relationships with public institutions highlighted the dangers of agribusiness entering ventures dependent on inexperienced public sector entities. SDC's own weakness was having uncommitted

management in the crucial formative years of 1989–1990 and a level of indifference at the company's headquarters. SDC's diversification experience accentuated the need to appoint managers of contract farming projects who had the necessary qualifications, experience, and empathy when dealing with farmers and appreciation of the sometimes complex political and social milieu of the developing world. In addition the importance of effective public sector support and effective managerial strategies to implement innovative cropping regimes is essential. The company's failure to *adapt*, particularly after its initial success with both papaya and maize diversification, resulted in Fiji's export papaya industry being set back by more than a decade. SDC was eventually taken over by British American Tobacco in 1996.

In Lombok, the company's diversification programme has shown that, out of the tobacco season, farmers need not depend on village moneylenders or 'loan sharks'. They could increase their rice yields and profit from crops other than tobacco. Commercial agribusiness prefers working with land-owning farmers as they are easier to manage, are stable, and self-sustained. The farmers that successfully accepted company-financed alternative crops were able to apply improved techniques such as advanced transplanting methods, liming, composting, and the planting of woodlots for fuel. The division between the farmers who are able to adopt the mixed farming model and those who are not may, however, eventually result in poorer farmers becoming hired farm labourers.

Sadhana's objectives are to continue to expand as a mixed farming model company in order to both retain its tobacco supply base and enhance its farmers' financial sustainability. Sadhana should also benefit by having a consistent and stable supply of tobacco from reliable farmers. In a general sense, Lombok's non-contracted farmers can also benefit through 'volunteer technical transfer' where they arbitrarily adopt new adaptations from their neighbours. This practice was observed in Fiji when SDC's maize project was implemented. Adjacent vegetable farmers changed their ridging, cultivation, and fertilizer application methods to reflect SDC's agronomic practices.

Tobacco is a complex crop to produce well and requires skilled inputs from company staff who work closely with farmers. Given the availability of such expertise, most tobacco companies are uniquely placed to impart their managerial abilities and technical knowledge by adapting and transferring those skills to other areas of agricultural production. This approach may be more beneficial in terms of developing company–community relations than the corporate social responsibility approach that often just involves the random distribution of 'public relations' handouts for festivals and sport. A major proviso must be that any alternative activities by companies must not adversely distract from their core objective, in this case, tobacco production. In addition, all subsidiary projects must be financially sustainable for the company and particularly for farmers.

The experiences of the Lombok and Fiji case studies show that diversification can be successful given positive direction and incentives. In the Fiji case weak management and poor direction stifled promising projects. In Lombok, local management has so far been given a free hand by the company's headquarters to explore a variety of options. Although tobacco with only one crop per year lends

itself to such diversification there is no reason why the type of farmer-support models discussed here could not be applied in the context of other contract farming ventures. It does, however, require willingness on the part of the management of schemes to support farmers in areas other than the core crop, even if there is, at best, ambivalence from head office.

Recommendations specifically related to diversification activities for any agribusiness company are:

1. Before considering diversification, assess what contribution and support the public sector can provide. This will be particularly important when the company ventures into crops and animals for which it does not have a core competence. All private investment needs government support both politically and in the form of utilities, quarantine, and plant pathology services. In Lombok the NTB and NGOs have offered only marginal support. In Fiji, the outcome was strangled by institutional inefficiency and apathy.
2. In addition to the physical environment, the most critical factors contributing to successful contract farming diversification are the aspirations and capabilities of the particular farming community. Over-expectation of farmers' abilities and resources can lead to failure and to indebtedness. Diversification should perhaps be introduced initially on a small scale, relying on success of the early adopters to provide a model for others to copy. Also, if diversification efforts do not succeed for some reason (e.g. supply of an inappropriate variety), the liability of the company to compensate farmers is reduced.
3. To address those factors outlined above, the company must select a positive and experienced management team with aptitudes for identifying opportunities. It is important that the management of projects focuses on these factors with a sympathetic understanding and appreciation of the farmers' customs, land tenure arrangements, and traditional farming systems. The negative results of the Fiji experience were, in part, caused by the appointment of a manager who was totally inexperienced to manage a multiracial farming community that needed empathic and regular guidance.

In the selection of management personnel for contract farming projects, criteria must not only include technical ability but also a willingness to understand the cultural background of the farming community. If they are expatriates, it is essential they attempt to gain a working knowledge of the farmers' language and an understanding of local cultural practices and etiquette. This will be interpreted as a concerned approach by the managers, thus supporting the benevolent 'patron-farmer' relationship as described by Glover and Kusterer (1990).

4. Sponsors of projects must be assured that markets or other outlets exist for all production from alternative crops including for the farmers' domestic benefit (food sustenance and woodlots). In Lombok the company did offer to buy maize and rice produced by its farmers but it was rarely requested to do this. Given the easy opportunity to side-sell food or feed crops it is probably not desirable for companies to do the marketing themselves. Repayment of loans can be obtained when the core crop is delivered, although care must be

taken that farmer indebtedness does not rise to levels at which the core crop then appears unprofitable.

5. When companies embark on diversification ventures it is recommended that all adaptation activities be monitored and recorded in the form of a production matrix as displayed in Table 5. The basic concept of a matrix is to formally classify all the particular components and benchmark specific production activities in terms of significance and managerial responsibility in the form of a blueprint which is updated on a seasonal basis. The analysis of SDC's papaya venture 1988–1991, pinpointed the weak links of the production chain that led to its closure. Impractical corporate planning, inappropriate technical inputs, and poor communication among participants are major reasons why contract farming ventures fail. Misjudgement by the sponsors of farmers' ability to cultivate quotas that they then cannot manage can cause serious problems and setbacks. Essentially, the role of managers is to implement and diffuse the contractual obligations and objectives as outlined in the agreement. This must also be the motivating catalyst of links between field extension services and farmers.

References

- Amigo, M. (2010) 'Small bodies, large contribution: children's work in the tobacco plantations of Lombok, Indonesia', *The Asia Pacific Journal of Anthropology* 11 (1): 34–51 <<http://dx.doi.org/10.1080/14442210903540393>>.
- Da Silva, C. (2005) *The Growing Role of Contract Farming in Agri-Food Systems Development: Drivers, Theory and Practice* [pdf] AGSF Working Paper 9, Rome: Food and Agriculture Organization <www.fao.org/fileadmin/user_upload/ags/publications/AGSF_WD_9.pdf> [accessed 16 June 2013].
- Eaton, C.S. (1988) *Directed Small-holder Farming in Fiji*, unpublished MPh thesis, Suva, Fiji: School of Social and Economic Development, University of the South Pacific.
- Eaton, C.S. and Shepherd, A.W. (2001) *Contract Farming: Partnerships for Growth* [pdf] Agricultural Services Bulletin 145, Rome: Food and Agriculture Organization <www.fao.org/docrep/014/y0937e/y0937e00.pdf> [accessed 16 June 2013].
- Glover, D. and Kusterer, K. (1990) *Small Farmers, Big Business: Contract Farming and Rural Development*, London: Macmillan.
- Harrigan, J. (2003) 'U-turns and full circles: two decades of agricultural reform in Malawi 1981–2000', *World Development* 31 (5): 847–63.
- McGregor, A. (1990) *Requirements for the Development of New Export Crops: The Case of Papaya*, Honolulu: Pacific Island Development Program, East-West Center.
- Nusa Tenggara Barat (NTB) (2006) Annual report *Nusa Tenggara Barat dalam Angka*, Mataram, Lombok: Agricultural Department.
- Patrick, I. (2004) *Contract Farming in Indonesia: Smallholders and Agribusiness Working Together*, Canberra: Australian Centre for International Agricultural Research.
- Simmons, P., Winters, P. and Patrick, I. (2005) 'An analysis of contract farming in East Java, Bali, and Lombok, Indonesia', *Agricultural Economics* 33 (s3): 513–25 <<http://dx.doi.org/10.1111/j.1574-0864.2005.00096.x>>.