

# Contract farming in Indonesia: Smallholders and agribusiness working together

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# Preface

IN RURAL areas of developing countries, markets are often poorly serviced. Smallholders are unable to take advantage of market opportunities and must pay high costs to overcome market imperfections. Farmers often have trouble accessing credit, obtaining information on market opportunities or new technologies, purchasing certain inputs and accessing product markets. When markets are accessible, farmers may be subject to price fluctuations or inequitable prices. Such difficulties are barriers to their development and represent a 'bottleneck' in the development process.

For smallholders, contract farming is potentially a way of overcoming market imperfections, minimising transaction costs and gaining market access. This approach, which has been implemented in other developing countries, may also provide benefits for smallholders in Indonesia and deserves priority in development research.

The purpose of this project was to identify opportunities for smallholder farmers in Indonesia to participate in contract farming and to determine policies to facilitate farmer entry into beneficial contractual relationships.

This report presents the results of one sub-project: a survey-based analysis of contract farming in Lombok and Bali.

The results from the study have direct relevance to legal reforms associated with contract specification and enforcement and policies concerning extension services.

The study is also relevant to the Indonesian Government support programs for farmers, especially those that have been implemented since the 1997 crisis, and to agribusiness companies seeking contractual relationships for commodity production.

The likely community benefits from the project are increased welfare resulting from the improved income levels of smallholders that will arise from contractual links with agribusiness. Improved material welfare will contribute directly to both economic and social goals of smallholder communities and, by increasing the choices open to smallholders, lead to greater flexibility on their part in dealing with environmental and technical issues.

*Peter Core*

*Director*

*Australian Centre for International Agricultural Research*

# Foreword

GLOBALISATION has led to rapid increases in agro-industrial activity in developing countries over the last two decades as new trading opportunities favour large-scale processing and marketing. Capital for expansion has come from both international and domestic sources and has led to a restructuring of agricultural enterprises, particularly for high-value food products. This expansion of trade has led to increased complexity in marketing and production arrangements with a plethora of new opportunities confronting smallholders. In turn, this has led to questions about the effects of new arrangements on absolute and relative poverty amongst smallholders, the types of new arrangements coming into existence and about roles governments and NGOs might play in facilitating this sort of change.

The ACIAR project from which these studies are drawn included other work undertaken with smallholders in East Java and interviews with agribusiness firms in Jakarta and elsewhere. However, because of the sheer quantity of information produced in the project this report focuses only on results of two household surveys conducted in Bali and Lombok.

The ACIAR project involved cooperation between a large number of individuals and organisations in Australia, Bogor, East Java, Bali and Lombok. The specific results reported here came from cooperation between the University of New England, Udayaana University and Balai Pengkajian Teknologi Pertanian (Bali) and Balai Pengkajian Teknologi Pertanian (Lombok). As the Project Leader for University of New England, with overall responsibility for the research, I will always be grateful to my colleagues for their efforts.

*Phil Simmons*  
*University of New England*

# *Pendahuluan*

SELAMA dua dekade terakhir, globalisasi telah menyebabkan meningkatnya kegiatan agro-industri di negara-negara berkembang secara pesat, sementara di pihak lain, peluang-peluang baru lebih banyak berpihak pada proses produksi dan pemasaran berskala besar. Modal untuk perluasan usaha dapat berasal dari berbagai sumber internasional maupun domestik, yang menimbulkan terjadinya restrukturisasi dalam bidang usaha pertanian, khususnya yang menghasilkan produk-produk makanan bernilai tinggi. Perluasan perdagangan ini juga telah mengakibatkan bertambah rumitnya sistem produksi dan pemasaran yang dihadapi oleh petani berskala kecil. Pada gilirannya, timbul berbagai pertanyaan mengenai akibat-akibat adanya sistem baru tersebut, khususnya yang berkaitan dengan tingkat kemiskinan relatif dan mutlak diantara para petani kecil. Peranan pemerintah serta lembaga swadaya masyarakat dalam menyediakan fasilitas terhadap perubahan semacam ini juga masih dipertanyakan.

Proyek ACIAR (*Australian Centre for International Agricultural Research*), yang menjadi sumber dari studi ini, dilakukan melalui serangkaian penelitian dengan para petani berskala kecil di Jawa Timur serta wawancara dengan perusahaan-perusahaan agribisnis di Jakarta dan beberapa tempat lainnya. Namun, dengan adanya begitu banyak informasi yang diperoleh dalam proyek ini, laporan ini hanya akan menitikberatkan pada hasil-hasil penelitian terhadap dua kelompok petani skala kecil yang dilakukan di Bali dan Lombok.

Sejumlah individu maupun organisasi telah terlibat dalam kegiatan kerjasama ACIAR ini baik di Australia, Bogor, Jawa Timur, Bali dan Lombok. Hasil khusus yang dilaporkan di sini berasal dari kerjasama antara Universitas New England, Universitas Udayana dan Balai Pengkajian Teknologi Pertanian (BPTP) Bali serta Balai Pengkajian Teknologi Pertanian (BPTP) Lombok. Sebagai pimpinan proyek dari Universitas New England, yang bertanggungjawab atas kegiatan penelitian secara keseluruhan, perkenankan saya mengucapkan terimakasih kepada rekan-rekan sejawat atas segala bantuan dan kerjasamanya sehingga proyek ini dapat terselesaikan dengan baik.

*Phil Simmons*  
*Universitas New England*

# Overview

AS DEVELOPING countries continue on the path of economic liberalisation, there is an urgent need to bring the benefits of new trade and market opportunities to rural areas. While producers with larger landholdings may have access to capital, marketing information and institutional support, smallholders often miss out and are more likely to be marginalised.

One possible mechanism for improving the livelihood of rural smallholders and providing them with the benefits of economic liberalisation is contract farming. Through contractual arrangements, agro-industry can assist smallholders to shift from subsistence or traditional agriculture to the production of export-orientated, high-value products. This not only has the potential to increase incomes of contracting smallholders but also to have multiplicative effects in the rural and broader economy.

Contract farming is an intermediate production and marketing system that spreads the production and marketing risks between agribusiness and smallholders. It can be regarded as a means of reducing high transaction costs that result from the failure of the market and/or government to provide the required inputs (e.g. credit, insurance, information, infrastructure and factors of production) and market institutions.

Positive evaluations of contract farming generally indicate smallholders either benefit from contracts in terms of enhanced profits or get out of them. Not only are there benefits in terms of improved access to markets, credit and technology, but contract participation can also provide improvements in risk management, increased family employment opportunities and, indirectly, empowerment of women and development of a successful commercial culture.

There is evidence, however, that contract farming may have a negative effect on the welfare of smallholders. There are concerns that contractors favour larger growers; hence poorer growers may be left out of the development process. Other hazards of contract farming are the potential for 'capture' of smallholders within contracts, negative social effects of the 'cash economy', narrowing of local markets as contracted production squeezes out local food production, deteriorating contract terms as contracts mature and general concerns about how multi-national corporations behave in developing countries.

This study evaluates the benefits to smallholders and agribusiness firms from participating in contracts in the eastern islands of Indonesia, specifically Bali and Lombok. These areas represent a range of farming systems and a diversity in social and institutional support structures. Bali is becoming increasingly dominated by tourism and construction industries which have forced up labour costs and discouraged private investment in agricultural industries. Lombok is a more traditional rural area with lower labour costs and less opportunity for off-farm work. This has led to greater opportunity for agribusiness in Lombok to build partnerships with smallholders than has occurred in Bali.

A total of 300 smallholders were surveyed in Bali, 150 of whom were at the time participating in the production of seed rice under contract to the semi-government firm PT Pertani. The remaining 150 were non-contract farmers who were selected due to their proximity to the contractors and their similar resource endowments. In Lombok there were 200 smallholders interviewed, 80 of whom had contracts with Nusantara Unggasjaya (NUJ) to grow out broilers. The remaining 120 did not have broiler chicken contracts.



Information was collected from each farmer concerning their household structure and assets, all farming and social systems, sources of income and credit history. Gross Margin (GM) and probit analysis were used to determine the factors contributing to the likelihood of smallholders participating in contracts. Equations for GMs were also specified to test whether contract participation led to increased capital returns.

Analysis of the survey data in Bali indicated that the seed rice contract had no significant impact on productivity of farm capital. The GM for seed rice was actually lower than the GMs for regular consumption rice grown by both contractors and non-contractors. In terms of the possible welfare gains from contracting the main benefits are in risk management and improved access to markets. The contract provides extension support and would overcome problems associated with lack of information, however, since husbandry for seed rice is similar to that for consumption rice and because the certification process includes a training component, the benefits here are limited. The major advantages of the contract for smallholders are in reducing risk. They receive an assurance their product will be purchased at harvest and, also, contracted production constitutes a form of diversification. There may also be benefits to the community in the longer term. Cooperation with government and agribusiness may improve the chances of future partnerships and access to government programs. The development or maintenance of networks by the community may lead to significant future opportunities/benefits.

The only significant smallholder characteristic which influenced contract participation was ownership of irrigated land. Contractors tended to have more irrigated land than non-contractors.

Initial consideration of the survey results indicated that contractors regard seed rice as simply another variety of rice. During the formal interview process it became clear that many smallholders were unaware that they were defined as contractors. They were simply growing the variety supplied to them through the *subak*. The nature of the *subak* ensures that farming decisions are made as a group, irrigation water is made available on a particular plot at a particular time. Water cannot be stored by individuals as this would influence water users further down the system. This overriding and necessary control of water by the group leads to individual smallholders becoming dependent on the group for other decisions such as what crop to plant and what inputs to use and when. In many cases individual smallholders did not know what variety they were planting; they planted the seed provided to the *subak* often at the recommendation of the *subak* leader (*pekaseh*).

The results indicate that with regard to a seed rice contract, participation was influenced by irrigated land ownership and group (*subak*) membership. The nature of the contracted commodity meant that no particular production or entrepreneurial expertise or attitude to risk was required. The characteristics of non-contractors and contractors were, therefore, similar. PT Pertani could have selected farmers from anywhere in Bali with the required attributes. Factors that may be important in these smallholders accessing the contract may be the attributes of the *pekaseh* (and maybe the village head), the distance and accessibility of the area and past experience in working with government and agribusiness. Instead of individual smallholder characteristics influencing participation it was community characteristics and social capital.

The broiler chicken contract in Lombok is entirely different. The production system is new, requiring significant smallholder capital and training. It is also individual based not group based so individual smallholder characteristics are important. There are significant differences between contractors and non-contractors. Contractors are younger, better educated and have better quality housing and sanitation. They are also less constrained by credit and tend to belong to more farmer groups. An important difference between contractors and non-contractors was that while contractors owned more non-agricultural assets, non-contractors owned more irrigated land and agricultural assets. Contractors are younger and more entrepreneurial smallholders who have less opportunity to produce irrigated crops. The broiler chicken alternative is highly profitable, with the total farm income of contractors nearly five times that of non-contractors.

Contractors are not poorer than the non-contractors but they do have less access to productive land assets. The introduction of an activity that does not require land but does require capital and a certain amount of risk suits this type of smallholder. Farmers who are fully employed on larger farms do not see the need, or do not have the available labour or capital, to introduce this type of enterprise.

Smallholders in Lombok are generally poorer compared with those in Bali. Broiler production input costs are high and smallholders receive advances from the firm for feed and other inputs to overcome potential credit constraints. The contract is a major form of diversification for smallholders as production risk is low and price risk is borne by the firm. The firm is concerned about continuity of supply and when prices fall on a seasonal basis it takes losses on production rather than lose contractors. The firm provides guidelines for production and there is little chance contractors would easily acquire the required level of expertise without participating in a contract. A possible negative associated with the contract is the possibility of 'capture'. Smallholders make large investments to get into the contract and these would not easily be written off if contract terms were to turn sour. However, we found no evidence of deteriorating contract terms.

In a relatively short time NUJ has developed a strong system of support for contractors which includes management advice and credit (to purchase inputs). The system has been so successful that the need for NUJ to provide an incentive for growers to sign their first contract has diminished and individual smallholders are now approaching the company and requesting a contract.

Both contracts were successful from the perspective of the agribusiness firms involved inasmuch as the contracts had each been operating for at least five years and none of them showed any sign of joining the long list of 'failed' farm contracts in the developing world. In general, the costs of negotiating contracts, such as maladaptation and running costs, as well as maintaining relationships with smallholders, turned out to be low enough to allow satisfactory margins for the agribusiness firms involved. The types of benefits experienced by smallholders were consistent with theory and each contract contributed positively to the welfare of smallholders participating in them.

The Lombok contract resulted in access to a production system that was technically demanding and where economies to size in processing and marketing would usually prevent smallholder access. Both contracts provided some access to credit or inputs and reduced

smallholder risk by providing assurances the firm would purchase outputs. From the statistical analysis, the contracts in Lombok resulted in improved returns to capital and left participants better off.

In the Bali contract, the contract did not increase returns to capital but did confer other benefits. From a development perspective the contracts reduced absolute poverty; however, given the agribusiness firms in Bali favoured larger smallholders and in Lombok favoured wealthier smallholders, the contracts may have increased relative poverty.

The study has shown that there are a range of contractual types that can be mutually beneficial to both smallholders and agribusiness in Indonesia. The commodity to be produced, the infrastructure and institutions available, and the capability of the smallholders influence the characteristics of a partnership arrangement. When developing contracts the following considerations need to be included:

1. Develop appropriate contractor groups (e.g. groups for seed rice, spatially diverse individuals for broiler chickens).
2. Provide credit, inputs and technical and management advice in order to maximise productivity.
3. Ensure smallholders repay loans to secure accountability and sustainability.
4. Spread risk (price and yield) between smallholder and firm.
5. Develop and implement quick and transparent payment systems.
6. Allow contractors and contractees to come and go from the contract and allow the contract to evolve over time as capability, institutions and infrastructure develop.

Given the benefits of contracting in terms of greater returns to capital and increased demand for labour, policy makers in Indonesia should view these contractual relationships in a positive light and seek mechanisms to expand these types of interactions between multinational corporations and smallholders.

# Tinjauan Singkat

SEMENTARA negara-negara berkembang terus mengarah menuju liberalisasi ekonomi, masyarakat di daerah pedesaan sangat memerlukan manfaat adanya peluang perdagangan dan pemasaran yang baru. Produsen yang memiliki tanah yang luas mungkin dapat mengakses modal, informasi pasar serta dukungan kelembagaan dengan mudah. Namun di lain pihak, petani dengan lahan yang sempit seringkali tidak memiliki kemudahan yang sama sehingga mereka bahkan menjadi tersisihkan.

Sistem pertanian kontrak (*contract farming*) merupakan satu mekanisme yang mungkin dapat meningkatkan penghidupan petani kecil di daerah pedesaan dan memberikan manfaat liberalisasi ekonomi bagi mereka. Melalui kontrak, agro-industri dapat membantu petani kecil beralih dari pertanian subsistensi atau tradisional ke produksi hasil-hasil pertanian yang bernilai tinggi dan berorientasi ekspor. Ini tidak hanya berpotensi meningkatkan penghasilan petani kecil yang ikut dalam kontrak tetapi juga mempunyai efek berlipat ganda bagi perekonomian di pedesaan maupun perekonomian dalam skala yang lebih luas.

Pertanian kontrak adalah sistem produksi dan pemasaran berskala menengah dimana terjadi pembagian beban resiko produksi dan pemasaran diantara pelaku agrobisnis dan petani kecil. Sistem ini dapat dilihat sebagai suatu terobosan untuk mengurangi biaya transaksi yang tinggi akibat kegagalan pasar dan/atau kegagalan pemerintah dalam menyediakan sarana (*input*) yang diperlukan (misalnya kredit, asuransi, informasi, prasarana dan faktor-faktor produksi lainnya) dan lembaga-lembaga pemasaran.

Penilaian terhadap sistem pertanian kontrak pada umumnya menunjukkan hasil yang positif dimana petani kecil memperoleh manfaat dalam bentuk laba yang lebih tinggi atau mereka bahkan keluar dari kontrak tersebut. Manfaat yang ada tidak hanya dalam bentuk akses pemasaran, kredit dan teknologi, tetapi keikutsertaan dalam kontrak dapat pula meningkatkan kemampuan dalam mengelola risiko, memberikan kesempatan kerja yang lebih baik bagi anggota keluarga dan, secara tidak langsung, pemberdayaan kaum perempuan serta pengembangan budaya berniaga yang berhasil.

Meskipun demikian, ditemukan pula bukti-bukti bahwa pertanian dengan sistem kontrak mungkin juga membawa akibat negatif bagi kesejahteraan petani kecil. Ada keprihatinan bahwa sistem kontrak lebih berminat terhadap petani berskala besar sehingga dengan demikian petani kecil mungkin tidak dilibatkan dalam proses pengembangannya lebih lanjut. Kecemasan-kecemasan lainnya ialah adanya kemungkinan bahwa petani kecil akan “terperangkap” dalam suatu kontrak, adanya akibat sosial yang negatif dengan adanya ‘ekonomi uang tunai’ (*cash economy*), serta makin sempitnya pasar lokal karena produksi sistem kontrak akan menguras produksi makanan lokal. Di samping itu juga dikuatirkan semakin memburuknya syarat-syarat kontrak pada saat masa kontrak akan berakhir serta adanya keprihatinan umum mengenai perilaku perusahaan-perusahaan multinasional di negara-negara berkembang.

Studi ini juga mengevaluasi manfaat yang diperoleh petani kecil dan perusahaan agribisnis yang turut ambil bagian dalam kontrak semacam ini di wilayah Indonesia bagian timur, khususnya Bali dan Lombok. Daerah-daerah tersebut mewakili berbagai macam sistem

pertanian dan aneka ragam struktur pendukung secara sosial maupun kelembagaan. Semakin lama, Bali semakin didominasi oleh industri pariwisata dan konstruksi, dimana hal ini telah menyebabkan melonjaknya biaya tenaga kerja serta membuat gamang pihak swasta untuk menanamkan modalnya dalam bidang industri pertanian. Lombok merupakan daerah pedesaan yang bersifat lebih tradisional dengan biaya tenaga kerja yang lebih rendah serta kesempatan kerja yang lebih minim di luar sektor pertanian. Karena keadaan tersebut, maka sektor agribisnis di Lombok mempunyai peluang yang lebih besar dalam membina kemitraan dengan petani kecil (*smallholders*) dibandingkan dengan di Bali.

Dari 300 orang petani kecil yang terlibat dalam survei ini di Bali, 150 orang diantaranya telah berhasil memproduksi benih padi menggunakan sistem kontrak dengan perusahaan semi-pemerintah, PT Pertani. Sementara 150 orang lainnya merupakan petani bukan kontrak yang dipilih dengan mempertimbangkan dekatnya jarak dengan kontraktor serta kepemilikan sumber daya yang tidak jauh berbeda. Di Lombok, terdapat 200 orang petani kecil yang berhasil diwawancarai, dimana 80 orang diantaranya mempunyai kontrak dengan Nusantara Unggasjaya (NUJ) untuk memelihara ayam pedaging (broiler), sedang 120 orang sisanya tidak memiliki kontrak sejenis.

Informasi yang dikumpulkan dari setiap petani/peternak meliputi struktur dan aset rumah tangga, sistem sosial dan pertanian, sumber penghasilan dan sejarah kreditnya. Analisis keuntungan kotor/bruto (*Gross Margin* — GM) dan laba dipakai untuk menetapkan faktor-faktor yang ikut menentukan keikutsertaan mereka dalam kontrak semacam ini. Hasil penjumlahan keuntungan kotor juga digunakan untuk menguji apakah keikutsertaan petani dalam sistem kontrak meningkatkan pendapatan atas modal mereka.

Analisis data pada survei di Bali menunjukkan bahwa kontrak untuk benih padi tidak membawa dampak yang signifikan pada produktivitas modal pertanian. GM untuk benih padi sebenarnya lebih rendah daripada GM untuk padi konsumsi yang ditanam oleh para petani kontrak maupun petani bukan kontrak. Sistem Pengelolaan risiko yang lebih baik serta berkembangnya akses pasar adalah peningkatan kesejahteraan yang mungkin diperoleh dengan adanya sistem kontrak.

Sistem kontrak akan memungkinkan adanya dukungan yang lebih luas serta dapat mengatasi masalah-masalah yang berkaitan dengan minimnya informasi. Namun demikian, manfaat yang diperoleh dalam hal ini juga terbatas disebabkan adanya proses sertifikasi yang mencakup komponen pelatihan dalam pembibitan benih padi termasuk beras untuk konsumsi. Manfaat yang utama dari sistem kontrak bagi petani kecil adalah faktor berkurangnya risiko. Mereka memperoleh kepastian bahwa produknya akan dibeli pada saat panen selain juga bahwa produksi yang dikontrakkan biasanya menyebabkan adanya suatu bentuk yang beragam. Masyarakat juga akan memperoleh manfaat dalam jangka waktu yang panjang. Kerjasama dengan pemerintah dan agribisnis akan meningkatkan peluang kemitraan di masa depan serta akses terhadap program-program pemerintah. Pengembangan atau pemeliharaan jaringan kerja oleh masyarakat juga akan mengarah pada diperolehnya manfaat serta peluang yang nyata pada waktu yang akan datang.

Satu-satunya ciri khas petani kecil yang benar-benar mempengaruhi keikutsertaan mereka dalam sistem kontrak adalah kepemilikan tanah irigasi. Petani kontrak cenderung memiliki tanah irigasi yang lebih luas dibandingkan petani non-kontrak.

Pendapat awal dari hasil survei tersebut menunjukkan bahwa petani kontrak menganggap bahwa benih padi hanyalah suatu jenis lain dari padi. Selama proses wawancara secara formal, nampaklah bahwa banyak petani kecil ternyata tidak menyadari bahwa mereka sebenarnya berperan sebagai petani kontrak. Mereka hanya menanam jenis yang disediakan bagi mereka melalui *subak*. *Subak* memiliki aturan-aturan tertentu dimana keputusan-keputusan yang berkaitan dengan masalah pertanian dibuat secara kelompok. Air irigasi disediakan di suatu titik tertentu dan diatur secara berkala. Anggota tidak diperkenankan menampung air sebagai cadangan untuk kepentingan individu, karena hal ini akan mempengaruhi para pengguna air lainnya di dalam sistem tersebut. Pengaturan air yang dilakukan oleh kelompok sangatlah perlu dan bersifat menyeluruh. Dengan demikian akan terjadi saling ketergantungan dalam kelompok dalam membuat suatu keputusan seperti misalnya tanaman apa yang akan ditanam, sarana apa saja yang akan digunakan dan kapan akan memulai masa tanamnya. Dalam banyak kasus, masing-masing anggota tidak tahu tanaman macam apa yang sedang ditanam. Mereka hanya menanam tanaman menggunakan benih yang diberikan oleh *subak*, yang kadang-kadang merupakan anjuran dari pemimpin *subak* (*pekaseh*).

Hasil survei juga menunjukkan bahwa keikutsertaan dalam kontrak benih padi dipengaruhi oleh status kepemilikan tanah beririgasi dan keanggotaan mereka dalam *subak*. Dengan adanya komoditas yang dikontrakkan berarti tidak lagi diperlukan keahlian tertentu dalam berwirausaha serta berkurangnya tingkat resiko. Dengan demikian, petani kontrak dan bukan kontrak mempunyai ciri-ciri yang sama. PT Pertanian dapat memilih petani-petani dari daerah manapun di Bali yang memiliki kepentingan yang sama. Faktor-faktor yang mungkin berperan penting bagi tiap petani agar memiliki akses terhadap suatu kontrak adalah peranan *pekaseh* (termasuk juga kepala desa), jarak dan kemudahan mencapai lokasi serta pengalaman dalam bekerjasama dengan pemerintah dan agribisnis. Dengan demikian, sistem ini sudah tidak lagi bersifat individu/perseorangan tetapi lebih bercirikan kelompok dengan modal bersama.

Kontrak ayam pedaging di Lombok mempunyai ciri-ciri yang sama sekali berbeda. Sistem produksinya masih baru, dan memerlukan pelatihan serta modal yang cukup besar dari para petani kecil. Sistem kontrak ini lebih bersifat perorangan daripada sistem kelompok. Terdapat perbedaan yang sangat mencolok antara petani kontrak dengan petani bukan kontrak. Petani kontrak pada umumnya berusia muda, memiliki pendidikan yang lebih baik serta mempunyai rumah dan sistem sanitasi yang lebih berkualitas, relatif tidak mengalami hambatan dalam masalah kredit yang biasanya menjadi persoalan bagi banyak kelompok petani. Salah satu perbedaan yang nyata adalah bahwa petani kontrak memiliki aset non-pertanian sedangkan petani bukan kontrak memiliki lebih banyak lahan irigasi dan aset pertanian. Petani kontrak berusia muda dan memiliki sifat kewirausahaan yang kuat namun mempunyai lebih sedikit kesempatan untuk menghasilkan tanaman-tanaman di lahan beririgasi. Pilihan pada ayam broiler menjadi sangat menguntungkan bagi petani kontrak, dengan penghasilan yang bisa mencapai lima kali lipat dibandingkan dengan penghasilan petani bukan kontrak.

Menjadi petani kontrak tidak berarti lebih miskin daripada menjadi petani bukan kontrak. Namun memang, akses mereka terhadap aset tanah yang produktif lebih kecil. Dengan diperkenalkannya jenis-jenis kegiatan yang tidak memerlukan tanah, tetapi memerlukan modal serta resiko tertentu, akan merupakan suatu pilihan yang tepat bagi petani kecil semacam ini.

Petani yang bekerja secara penuh di suatu lahan pertanian yang besar dengan modal serta tenaga kerja yang memadai tidak melihat adanya kebutuhan untuk memperkenalkan lebih luas bentuk usaha seperti diatas.

Petani kecil di Lombok pada umumnya lebih miskin dibandingkan dengan petani kecil di Bali. Biaya untuk produksi daging ayam sangat tinggi dan petani kecil menerima uang muka dari perusahaan untuk membeli pakan dan keperluan lain untuk mengatasi potensi keterbatasan kredit (*credit constraints*). Kontrak tersebut merupakan bentuk utama dari diversifikasi untuk petani kecil karena resiko dari rendahnya produksi dan resiko harga ditanggung oleh perusahaan. Yang terutama bagi perusahaan adalah kelangsungan pasokan dan apabila terjadi penurunan harga berdasarkan musim, maka perusahaan lebih memilih untuk menanggung kerugian produksi daripada kehilangan petani kontrak. Perusahaan memberikan pedoman untuk produksi dan kemungkinannya sangat kecil bagi petani kontrak untuk dapat dengan mudah memperoleh tingkat keahlian yang diperlukan tanpa ikut serta dalam kontrak. Segi negatif yang mungkin berkaitan dengan kontrak ialah kemungkinan 'terperangkap'. Petani kecil menanamkan modal yang besar untuk ikut serta ke dalam kontrak dan ini tidak akan dapat dihapus dengan mudah jika ketentuan kontrak berubah dan merugikan. Akan tetapi, kami tidak menemukan bukti-bukti adanya ketentuan kontrak yang merugikan.

Dalam waktu yang relatif singkat NUJ telah mengembangkan suatu sistem yang kuat untuk mendukung para kontraktor termasuk saran dalam bidang pengelolaan dan kredit (untuk membeli masukan). Sistem ini begitu berhasil sehingga NUJ tidak lagi perlu memberikan insentif kepada petani untuk menandatangani kontraknya yang pertama. Dan sekarang petani kecil mendatangi perusahaan dan meminta kontrak.

Kedua kontrak tersebut telah berhasil apabila dilihat dari perspektif perusahaan yang terlibat sejauh kontrak-kontrak tersebut telah berjalan selama sedikitnya lima tahun dan tidak ada yang menunjukkan tanda-tanda akan masuk daftar panjang kontrak pertanian/petanian yang 'gagal' di negara-negara berkembang. Pada umumnya, biaya negosiasi kontrak: biaya salah adaptasi, biaya pengoperasian dan biaya untuk menjaga hubungan dengan para petani/petani kecil, ternyata cukup rendah sehingga perusahaan agribisnis yang terlibat dapat memperoleh margin yang memuaskan. Jenis keuntungan yang diperoleh petani kecil umumnya sejalan dengan teori dan setiap kontrak memberi sumbangan positif pada kesejahteraan para petani/petani yang terlibat. Kontrak di Lombok menghasilkan akses pada sistem produksi yang secara teknis cukup menuntut dan dalam perekonomian di mana proses dan pemasaran dibedakan berdasarkan besar kecilnya yang biasanya menghalangi akses petani/petani kecil. Kedua kontrak tersebut memberikan akses kredit atau masukan dan mengurangi risiko petani/petani kecil dengan memberikan jaminan bahwa perusahaan akan membeli produk. Dari analisis statistik, kontrak di Lombok menghasilkan peningkatan perolehan atas modal dan memperbaiki keadaan peserta. Dalam kontrak di Bali, kontrak tersebut tidak meningkatkan perolehan atas modal akan tetapi memberikan manfaat lain. Dari sudut pandang pembangunan, kontrak-kontrak tersebut menurunkan kemiskinan mutlak. Akan tetapi mengingat bahwa perusahaan agribisnis di Bali lebih mendukung petani yang lebih besar dan di Lombok lebih mendukung petani yang lebih kaya, maka kontrak tersebut mungkin akan mengakibatkan bertambahnya kemiskinan relatif.

Studi menunjukkan adanya bermacam-macam kontrak yang dapat bermanfaat baik bagi petani/petani kecil maupun agribisnis di Indonesia. Komoditas yang akan dihasilkan, prasarana dan lembaga yang tersedia, dan kemampuan petani/petani kecil dapat mempengaruhi ciri-ciri kemitraan. Dalam mengembangkan kontrak, hal-hal berikut perlu dipertimbangkan:

1. Pengembangan kelompok petani kontrak yang sesuai (misalnya kelompok untuk benih padi, pengelompokkan perorangan untuk penghasil ayam pedaging).
2. Penyediaan kredit, masukan dan nasihat dalam bidang teknis dan manajemen untuk memaksimalkan produktivitas.
3. Memastikan bahwa petani kecil membayar kembali pinjaman untuk pertanggungjawaban dan kesinambungan usaha.
4. Pembagian risiko (harga dan hasil) antara petani kecil dan perusahaan.
5. Pengembangan dan pelaksanaan sistem pembayaran yang cepat dan transparan.
6. Memungkinkan petani kontrak dan yang dikontrak bergabung dalam suatu kontrak dan memberikan kesempatan agar kontrak itu berkembang selama beberapa waktu sementara kemampuan, lembaga dan prasarana ikut berkembang pula.

Mengingat manfaat kontrak dalam hal lebih besarnya perolehan atas modal dan meningkatnya permintaan tenaga kerja, maka pembuat kebijakan di Indonesia sebaiknya memandang hubungan-hubungan dalam kontrak ini secara positif, dan mencari mekanisme untuk memperluas interaksi-interaksi seperti ini antara perusahaan multinasional dan petani kecil.



# 1

## An introduction to contract farming



## The economic environment

### *The changing world*

OVER THE last two decades market liberalisation has profoundly influenced agriculture in both developed and developing parts of the world. Market liberalisation — driven by WTO and earlier GATT Rounds, new technology and changing food habits — has resulted in deregulation of domestic food markets and the opening and expansion of international markets (Jaffee, 1995). Market liberalisation is changing patterns of agricultural production in terms of on-farm crop and livestock mixes, increasing total production in physical and value terms and changing the types of food products entering international markets. Traditional values and habits in agriculture are being replaced by transactions that increasingly reflect a ‘cash culture’ (Ponte 2000, Marsh and Runsten 1995, Goodman and Watts 1997).

As developing countries continue on the path of economic liberalisation, there is an urgent need to bring the benefits of new trade and market opportunities to rural areas. While smallholders with larger landholdings may have access to information about opportunities and access to institutional support to take advantage of those opportunities, other smallholders are less likely to have such access and are more likely to be marginalised.

One possible mechanism for improving the livelihood of rural smallholders and providing them with the benefits of economic liberalisation is contract farming. Through contractual arrangements, agro-industry can assist smallholders to shift from subsistence or traditional agriculture to production of export-orientated, high-value products. This not only has the potential to increase incomes of contracting smallholders but also to have multiplicative effects in the rural and broader economy. Without the benefits of contracting with agro-industry, smallholders may be unable to shift production to high-value crops and take advantage of new opportunities.

### *Contracting and development*

Goodman and Watts (1997) argue production of high value food products in developing countries has led to the emergence of ‘New Agricultural Countries’ (NACs). Exports of traditional crops such as cereals, sugar and tropical beverages have declined, while commodities such as Brazilian citrus, Mexican ‘non-traditionals’, Kenyan off-season vegetables and Chinese shrimp have become an increasing proportion of both total and export agricultural income. The increase in exports of high value foods has been followed by the rapid rise of the supermarket sector particularly in Latin America where it has transformed agri-food markets (Reardon and Berdegue 2002). Much of the development of the export market and supermarket industry has been underpinned by contracts between agribusiness

firms and smallholders in developing countries (Jaffee 1994, Reardon and Berdegúe, 2002). Such relationships are likely to expand as markets continue to liberalise.

There is evidence of contract farming improving smallholder welfare in other parts of the world. In Latin America, for example, there has been widespread use of contracts and in many instances smallholders are actively participating. In Guatemala, smallholders are contracted to produce broccoli and snowpeas for export to the United States. In Peru, asparagus is produced under contract for a company that exports to Europe. In Ecuador, the multi-national Frito Lay contracts smallholders to produce a particular variety of potato for processing into chips for the domestic market. In each of these cases, smallholders are realising economic benefits from market liberalisation.

### *Contracting and developed countries*

Contract farming is not solely used in developing countries. Contract farming in developed countries can be viewed as responses to market imperfections. In particular, contracts are a result of three factors: quality, timing and risk. In some agricultural processing industries, firms require a specific quality or type of product and need the product in a timely fashion. In order to avoid the uncertainty associated with the spot market they strike contracts with farmers to ensure prompt delivery of a highly specified product. For example, the Australian company Edgels has contracted out production of peas, asparagus and baby corn for its cannery in Bathurst to ensure timely and high quality product. The fast food chain McDonalds contracts for gherkins since it requires a particular variety and standard. In Tasmania, manufacturers of frozen chips contract potato smallholders to ensure the right varieties are produced and the quality is reliable.

## A theoretical basis for contract farming

### *Alternative market options*

Agro-industry can use a number of methods to obtain raw materials. At one extreme they rely on spot markets for supply by purchasing commodities at the going market rate. At the other extreme, they can vertically integrate and develop estate operations where the product is produced by the firm with hired labour. Contract farming represents an intermediate institutional arrangement between these two that allows firms to control certain elements of production without owning the means of production.

## THE SPOT MARKET

The spot market relies on large throughputs where individual growers (sellers) and traders/companies (buyers) have no influence on quantity and quality; therefore they have no influence on price. The spot market is an institution that relies on minimal market failure. It relies not only on many buyers and sellers but also on access to information and the ease of entry and exit to the market. Developing countries have fewer functioning spot markets than developed countries. While there are adequate spot markets for basic commodities such as rice and maize, in many areas there is less likely to be available markets for non-traditional products such as strawberries, seed corn and many types of vegetables.

While there are markets available for commodities such as coffee, sugar and broiler chickens, smallholders' ability to produce these commodities are limited by high input, capital and transaction costs.

## PLANTATION

Another option for agribusiness firms is to vertically integrate and operate their own plantations. Plantation style agriculture allows agribusiness and smallholders to minimise commodity and quality risks when supplying spot or contract markets. Smallholders may not be prepared or financially able to make longer-term investments in tree or high-input annual crops. Because of high capital and/or capital costs, lack of local/domestic markets and a variable price, smallholders do not produce these types of commodities.

While a plantation style of production does minimise a number of transaction costs it also leads to other costs. One of the most important is the cost of supervision which, because of the likelihood of 'shirking', can be high for some types of crops or livestock enterprises (Hayami and Otsuka 1993). This type of transaction cost is related to the kind of crop technology used and increases with its complexity. For example, large plantations work well for tropical beverage crops where management tasks are clearly defined, usually uniform and do not require judgement or a great deal of initiative on the part of workers. Alternatively, non-traditional crops such as vegetables for export, are unlikely to be successful in a plantation environment since they are technically more sophisticated and require worker initiative to achieve satisfactory yields and meet quality requirements (Hayami and Otsuka 1993). Other high transaction costs in plantation production include costs associated with land and skill acquisition and sunk costs incurred in establishment of infrastructure and 'setting up'. Plantations also depend on a relatively skilled supervisory and management team requiring substantial investment in human capital. Transaction costs on plantations may also result from unionisation or politicisation of workers resulting in opportunistic behaviour (Coulter et al. 1999). Also, governments or individuals with political power may see the relatively fixed investments associated with plantations as opportunities for either *ad hoc* taxation or as soft targets for extortion.

## CONTRACT FARMING

The type of commodity produced will influence the type of transaction costs incurred and hence the type of production and marketing system required. Contract farming is an intermediate production and marketing system which spreads the risk between agribusiness and smallholders and addresses the key transaction costs. This is unlike the spot market where risk and costs are clearly separated between stakeholders and in plantations where the risks and costs are borne by the firm.

Key and Runsten (1999) consider the development of contract farming production and marketing systems as a response to market failure. The key market failures that ensure smallholders cannot participate in the spot market are in the areas of:

1. *Credit*. Production of high-value non-traditional commodities is generally much more costly than traditional commodities and is more likely to require credit. Credit markets in developing countries are often missing or imperfect. Agribusiness firms are in an excellent position to act as lenders because they can withhold repayments from the production returns.
2. *Insurance*. Non-traditional crops tend to pose a higher income risk on smallholders because of the higher production costs. They are also riskier because they are more susceptible to pests making both yields and prices variable. High transaction costs keep firms from offering insurance policies in rural areas of developing countries and informal insurance mechanisms are limited due to a number of costs. Agro-industrial firms, because of their portfolio of activities across commodities and geography, are in a good position to insure against risk. By offering a forward contract with a fixed price which includes a risk premium, firms can help smallholders manage risk.
3. *Information*. Production efficiency depends on information on appropriate technology, on the quantity and timing of input application and on desirable crop characteristics. Missing markets for information can slow or inhibit the flow of information to smallholders. Agro-industrial firms can efficiently communicate information to smallholders through a number of mechanisms including the use of contracts that stipulate interaction with firm extension agents. Another potential information problem in agricultural production relates to work effort of hired workers. Without supervision, hired workers on estates or large farms may shirk and not put in as much effort as desirable. On small farms, most labour is family labour and is less likely to shirk. Since the returns to production for a contracting smallholder accrue to the household, firms can take advantage of the presence of motivated family labour by contracting to family farms.
4. *Factors of production*. Markets for specialised inputs for production of non-traditional crops, such as certain machinery or seeds, may not be readily accessible on the market and smallholders may have difficulty securing these

inputs. Additionally, because of failures in the land and labour markets, land and labour owned by households may be under-utilised. Through contracting, firms can provide smallholders with access to necessary inputs and obtain access to under-utilised, and less costly, labour.

5. *Product markets.* Undeveloped product markets may make it difficult for firms to obtain the appropriate quantity and timely delivery of commodities. Through contracting firms can ensure reliable delivery.

### *Benefits and risks of contracting to smallholders*

Positive evaluations of contract farming generally indicate smallholders either benefit from contracts in terms of enhanced profits or get out of them. Benefits from contract participation result from improved access to markets, credit and technology, better management of risk, improved family employment and, indirectly, empowerment of women and development of a successful commercial culture (Glover and Kusterer 1990; Runsten 1992; Key and Runsten 1999; Eaton and Shepherd 2001).

There is evidence, however, that contract farming may have a negative effect on the welfare of smallholders. A number of authors express concern that contractors favour larger growers and hence poorer growers may be left out of the development process (CDC 1989; Runsten 1992; Little and Watts 1994). Other hazards of contract farming are the potential for ‘capture’ of smallholders within contracts, negative social effects of the ‘cash economy’, narrowing of local markets as contracted production squeezes out local food production, deteriorating contract terms as contracts mature and general concerns about how multi-national corporations behave in developing countries (Clapp 1988; Wilson 1990; Little and Watts 1994; Torres 1997; Singh 2000).

The evidence on the benefits of contract farming to smallholders is mixed. For example, Warning and Key (2000) find that Senegalese smallholders that participate in a peanut contract farming program receive higher income from their participation and that the program structure allows the participation of poor smallholders. Other researchers have noted only limited benefits to smallholders and even cases where smallholders have been directly or indirectly harmed (Glover and Kusterer 1990).

The benefits to smallholders of contract farming are dependent on a number of factors. The first issue to consider is whether smallholders are able to participate in contract farming when contracts are being offered. That is, if agro-industry is offering contracts for the production of a certain commodity, will the tendency be to offer contracts to smallholders or larger landholders? The answer to this question depends largely on characteristics of the commodity, the farming households and the context in which smallholders operate. For example, if a commodity is labour intensive then contracting smallholders for production, who tend to have inexpensive and under-utilised labour, might be advantageous.

However, the transaction costs of searching for appropriate smallholders and screening out better smallholders may be high and limit the ability of agro-industry to link with smallholders. Additionally, maintaining and monitoring quality may be difficult when dealing with numerous smallholders. In these cases, the presence of complementary institutions, such as smallholders organisations, may be paramount. Exclusion from contract participation by smallholders can limit opportunities for smallholders and exacerbate income inequalities in rural areas.

A second consideration in determining the benefits of contract farming to smallholders is to evaluate the benefits of participation. Although agro-industrial firms may provide credit and inputs for production, thus overcoming market imperfections, agro-industry may be in a strong bargaining position and able to extract significant rents from smallholders leaving them only marginally better off than without contracts. The benefits to smallholders depend primarily on their bargaining power. The bargaining power of smallholders will be limited if they are unorganised, have few assets and scarce alternative income opportunities (Key and Runsten 1999).

One test of the benefits of contracts to smallholders is the effect of contracting on income. Given evidence that smallholders are often more efficient than large plantations when they are effectively linked with agro-industrial processing and marketing firms (Hayami et al. 1990), positive benefits from contracting on smallholder income are possible.

### *Benefits and risks to agribusiness*

There are also reasons why agribusiness firms enter contracts with smallholders. The most important reason is they gain access to relatively cheap labour and land in order to grow high-value commodities that would not normally be grown by smallholders. Firms can participate in markets where they would normally be excluded. They can minimise costs by not purchasing land or directly hiring labour. Through provision of credit, other inputs, and in some cases technical advice, firms can encourage smallholders to produce new commodities. There are several areas of potential savings for agribusiness firms in providing credit. If the firm is large and well established it is likely to obtain funds at normal business rates. A large firm may also have advantages over moneylenders in management of risk because of the size and diversity of its loan portfolio. That is, investing in a large number of small cash advances allows diversification of lending risk either across participants in a particular contract or across participants in a number of different commodity contracts or activities. The agribusiness firm also has lending advantages by virtue of its contract. A contract allows monitoring of input use, a degree of control over crop management decisions that might jeopardise repayment and it can specify how cash advances are to be repaid. Also, contracts require delivery to the firm hence, cash advances can be deducted from post-harvest cash settlements (Key and Runsten 1999).

While there are benefits in encouraging smallholder production through contracts, agribusiness firms are required to bear some risk. Most contracts stipulate the firm will purchase all production, usually at a price higher than the prevailing market price. The firm may bear risks of crop failure due to bad management or seasonal factors. To mitigate against these potential losses, the firm may maintain tight control over management and offer seasonal or annual contracts so that bad producers can be excluded from future contracts.

## Contract farming in Indonesia

### *Types of contracts/partnerships commonly used in Indonesia*

There are many different contract types available to smallholders and agribusiness. The final characteristics of the partnership will depend on the available institutions to support production and product markets, the commodity being produced, the resource base of the producers and capacity of the agribusiness firm. While there are many derivations, in Indonesia they can be summarised into four types: plasma and nucleus, sub-contract, harvest and pay and *kerja sama operational (KSO)*.

#### PLASMA AND NUCLEUS

This form of contract involves an agricultural enterprise (the nucleus) providing inputs to farmers (or collectively a group of farmers) and buying the produce. Besides input provision, the nucleus also provides technical expertise relevant to the commodity being produced. The smallholder's responsibility is to produce the required commodity. Examples of this system are contracts between *subak* in *Kabupaten* Tabanan (Bali) with an agriculture company in Denpasar (PT Jagung Arjuna). (For a description of the *subak* see p. 20). The smallholders in Tabanan must grow corn, which the company purchases in order to process or resell. This has been in place for several years. Similar types of contracts have been used in Japanese-ginger production in *Kabupaten* Bangli regency, 1994–97; tobacco plantations throughout Indonesia; and between a *subak* in *Kabupaten* Jembrana and the government-owned seed company producing seed corn (Variety Bisma BP-BP1). There is also the contract between sugar producers and sugar mills (e.g. PTP Nusantara XI) in East Java and the Beef Nucleus Estate and Smallholder (Beef NES) scheme that use this system.

#### SUB-CONTRACT

This type of partnership involves an agribusiness firm having a contract to supply commodities to a third party. The firm, based on the quantity and quality requirements, will then sub-contract production to smallholders, or groups of smallholders. For example, an agricultural trader in Baturiti (*Kabupaten* Tabanan,



Bali) has a contract to supply a variety of horticultural products to hotels and restaurants in Nusa Dua. The products include paprika, tomato, lettuce, cabbage, celery, cauliflower and cut flowers. The trader sub-contracts the production to groups of farmers in several villages in Bedugul; some groups grow tomatoes, some grow lettuce. The trader does not provide any technical or management assistance to the growers, promising only to buy a certain volume of the produce per day (or per week), of a specified quality at the spot market price.

This trader benefits by being able to reduce supply fluctuations and satisfy large contracts while the smallholder can minimise transport costs and guarantee a market price for a commercial, high-value crop.

#### HARVEST AND PAY

This form of contract generally occurs only in small-scale production systems. A local trader provides credit for smallholders to buy inputs (usually seed and fertiliser), with a promise that the smallholder will sell their produce to the trader. The cost of credit gets paid for at harvest, when a negotiated price is determined that takes into account both the cost of credit and spot market price. Payment may be in kind or cash. This type of partnership arises because smallholders find it difficult, or impossible, to access credit from formal or informal (i.e. neighbours and family) sources.

#### KERJA SAMA OPERATIONAL (KSO)

This system entails a company (e.g. a sugar mill) not only providing all the inputs but also paying the farmer an *imbalan penggunaan lahan* (IPL), usually the market rental value of the land for a season or more. The IPL is paid at the beginning of the contract and serves as a base payment to be topped up depending on the harvest. It is, in fact, a minimum wage for the length of the KSO. It is particularly useful for long-duration crops such as sugar cane. The benefit to the smallholder is income security with an incentive to produce a good crop, while the benefit to the contractor is a guaranteed supply. This system was introduced in 1988 with the formation of the government authority PTP Nusantara XI set up to mediate between smallholders and sugar mills. It was clear that the sugar industry was suffering partly due to the long-term nature of sugar cane crop with some varieties taking 14 months to mature. Many smallholders could not invest capital for this length of time. The system of KSO provided smallholders with up front cash (land rental), a wage to grow the crop and a bonus if production is high. This system provided incentives for smallholders to continue growing sugar cane and a guarantee of production for the mill.

### *National level policies*

Government rural policy is aimed at accelerating rural community development and is detailed in the National General Plan (GBHN) 1999–2004. Unlike past

five-year plans which maintained central government decision making and control, this planning program encourages the decentralisation of goal and budget setting from national down to provincial, district and village government levels. The goals of this policy are to:

- increase local autonomy by improving local government capacity;
- increase welfare through improved quality village infrastructure, with particular emphasis on the less developed villages;
- increase welfare through improved capacity of local institutions and human capital, with particular emphasis on the less developed villages.

This new policy has encouraged provincial governments to take responsibility for, and receive the benefit from, local skills and resources. Provincial governments have become responsible for attaining their own development objectives.

Present policy has been influenced by the economic crisis of 1997. This has led to changes in international and domestic policies and priorities. The Indonesian Government has been encouraged by the IMF to introduce freer trade and withdraw support from centralised marketing and pricing systems. While this has caused many prices to rise, particularly fuel and food costs, it has also provided increased opportunities for international trade and investment.

One lesson learned by the Indonesian Government as a result of the crisis was the importance of agriculture as a safety net. Large numbers of unemployed workers returned to their villages and farms relying on family to provide welfare assistance. The government has reassessed the importance of agriculture and provided increased support to assist in food safety programs. Although Indonesia became self-sufficient in rice production in 1984, the government is shifting emphasis to other food crops.

Other actions undertaken by the Indonesian Government to accelerate rural and agriculture development are:

- imposing and evaluating monetary and fiscal policies, such as reducing export taxes, rescheduling subsidy packages, offering production and consumption credit;
- facilitating and encouraging agro-industry development;
- re-evaluating marketing system, legal institutions and cooperation policies;
- infrastructure and institutional development policies;
- improving agricultural research and development facilities;
- increasing smallholder human capacity through better education and training;
- improving natural capital as well as natural resource management and environmental protection and renewal;
- food safety policies.

The Indonesian Government has not become directly involved in contract farming; however, it does monitor the extent of contracting. In East Java the extension service (*Balai Pengkajian Teknologi Pertanian, BPTP*), monitors contract farming in asparagus, visits smallholders and evaluates performance. There is no evidence of assistance with inputs or extension services.

# Understanding contract farming in Indonesia

## *Project objective*

It is important to determine whether or not contract farming can play a role in improving smallholder welfare in Indonesia and whether there is potential for expanding contract farming among smallholders, particularly among poorer farm households. To determine the role that contract farming might play it is necessary to define the commodities under contract, determine the benefits of contract farming for smallholders, evaluate the market for contracted commodities, understand the agro-industrial perspective on contracting and define future opportunities.

This information will be useful to: Indonesian Government policy makers; provincial governments involved in provision of services and administration of various types of support to smallholders such as provision of credit and other production inputs; agribusiness firms that are expected to take the lead in striking new contracts with suppliers of farm produce and NGOs.

It is important to increase basic knowledge of the way contracting is occurring, its effects on poverty, impediments to entry to contracts and areas where it is most likely to expand. In addition, consideration of specific issues related to the impact of contracting on market development is relevant to policy in this area.

## *The study area*

The provinces of Bali and West Nusa Tenggara (NTB) have been selected as the study areas. They represent a range of farming systems and a diversity in social and institutional support structures. Bali is a highly fertile province that produces a large range of commodities within easy distance of major industrial and urban centres. It is dominated by developed tourism and construction sectors which have increased the value of labour and land. This has important implications for the agricultural sector. Bali is also predominantly Hindu and hence has different social and religious cultural values and priorities. NTB is significantly poorer than Bali. While there are some good, fertile areas in central Lombok, smallholders do not generally have the same opportunities. A less developed tourism sector and remoteness from the main urban markets ensures that smallholders in NTB have less opportunity to participate in the spot markets. Smallholders in NTB are more likely to produce at a subsistence level than smallholders in Bali.

## *The work plan*

While contract farming has a long history in Indonesia, much of it has been in traditional estate crops. Recent changes in the structure of the economy resulting from the 1997 financial crisis and subsequent reforms have led to changes in

agricultural markets and the development of new opportunities in agriculture. These changes have created incentives for increased interaction between agro-industry and agricultural producers. Therefore, the first step in the research was to examine current use of contracts in the agro-industrial sector and identify industries in which contract farming was prevalent. Industries including significant numbers of smallholder contractors, or requiring significant labour inputs in production, were identified. This initial study was done in a participatory manner by appropriate stakeholders including agribusiness as well as government and smallholder associations cooperating with regional research institutions.

To assess the benefits of contract farming to smallholders, primary data was collected using survey methods. Data from the surveys allowed detailed analysis of:

- benefits of contract farming;
- types of contracts that are most beneficial to smallholders;
- gender impact of contract farming;
- impact on the environment; and
- factors leading to smallholder participation in contracts.

### *The survey*

Surveys in the case study areas were undertaken in 2002: Bali in May and Lombok in October. A total of 500 smallholders were interviewed within these areas: 300 in Bali and 200 in Lombok. In each province a mixture of contractors and non-contractors were interviewed.

For convenience, smallholders gathered in the *Balai Dusun* or *Desa* (village office). Smallholders were compensated for their travel and time away from their farms. Interviews were carried out on a one-on-one basis with an enumerator (the term used to describe the person responsible for conducting the interview and completing the survey form) who had the appropriate language skills. There was no opportunity for other smallholders to interject in the interview. Only heads of households were interviewed.

Prior to interviewing, enumerators were trained and made familiar with the survey form. The following process was undertaken.

1. The survey form was constructed by UNE with assistance from BPTP in the respective province.
2. The motivation and aims of the survey were outlined to all enumerators and others involved in assisting with the survey.
3. The survey form was explained to the enumerators, where it was stressed that bias must be avoided and all questions completed. This was an open discussion where enumerators were able to have an input into the survey structure; the form was adjusted.
4. A trial survey was undertaken by an experienced interviewer while trainees watched and completed the form.

5. The team of enumerators visited the survey area and undertook two additional trial interviews; after each interview was completed the form was examined and any problems discussed.
6. If the trial surveys were successful and the enumerator was judged to have the required skills then they were allowed to participate in the survey. During the surveying each form was checked immediately after completion. If there were inconsistencies or incomplete information the enumerator was responsible for completing the form even it meant travelling independently to the smallholder's house.



*Interviews were carried out with 500 smallholders in Lombok and Bali on a one-to-one basis.*

## *Methodology*

A probit analysis was conducted to determine factors contributing to the likelihood of smallholders participating in contracts (Judge et al. 1982). It was hypothesised contracting firms were monopsonistic (i.e. the only potential buyers of the contracted commodity) and favoured selection of larger smallholders with lower unit costs reflecting economies to size. Participation was expressed as a function of ownership of land, physical, human, community and 'other' capital. Land capital was captured using hectares of dry and irrigated land under management; human capital was captured using the level of education of the household head and his age as a proxy for experience and lifecycle effects. Community capital was approximated using membership of the head of household in agricultural groups and of all household members in various village groups. Ownership of 'other capital' invested in (non-land) agricultural and non-agricultural assets was also

included. A variable for expenditures on chemicals was included with the expectation that it would be attractive for cash constrained smallholders to find access to farm inputs provided in contracts.

It was also assumed that contracts helped households overcome high transaction costs associated with borrowing and in finding off-farm work so that smallholders who were credit constrained or had larger families would self-select for the contract. Variables were included for household size, borrowing history and a dummy variable was included for situations when the smallholder reported himself to be 'credit constrained'. The results for each case study are discussed in the relevant sections.

Equations for gross margins were specified to test whether contract participation led to increased capital returns. Farm gross margins were expressed as functions of physical, human, financial and social capital that, if constrained, could reduce returns and household size. This in turn could effect returns if off-farm work was difficult to obtain. Under parity, smallholders who were within proximity of each other in each survey area faced a smooth price surface for inputs and outputs so prices could be subsumed into coefficient values. Contract participation was included as a dummy variable.

It was possible that contract participation and gross margins were jointly determined; hence it was necessary to use a two-stage estimation procedure (Angrist 2000). A linear probability model of contract participation using the same variables as in the probit analysis was estimated and forecasts from it used in second-stage estimation of a linear gross margin equation. Hausman's test for endogeneity was conducted and, where the hypothesis of endogeneity was rejected, gross margin equations were re-estimated using ordinary least squares with an exogenous dummy variable for contract participation (Doran 1989).

## 2 Contracting in Bali



## Bali in context

### *The land*

Bali is an island with a total land area of 5600 km<sup>2</sup> located at the eastern point of Java (Figure 1). It has two distinct seasons: a dry season (April–September) and a wet season (October–March). Average annual rainfall is 2340 mm. The land is mostly arable with drier areas in the east caused by a rain shadow from the volcanoes of Mt Batur and Mt Agung.

Intensive small-scale agriculture is practised throughout the year. In some of the more fertile areas smallholders are able to produce three crops per year. There is, however, increasing pressure on agricultural land from the tourist industry and urban expansion, with large productive areas being purchased for new subdivisions, hotels and recreational use. Decreasing crop land (in particular the irrigated *sawah*) and a rising population have led to a demand for increased production. So far, new varieties and greater use of chemicals have improved productivity but the long-term future is uncertain.



**Figure 1.** Indonesia and the study area.



## The people and government

In 2000 the population of the province was three million, with a population density of 532 persons per km<sup>2</sup> (CBS 2001). The population growth in Bali is lower than other provinces in Indonesia because of the success of *system banjar*, the family planning program. Bali is unique in that while Indonesia is predominantly Muslim, Bali is predominantly Hindu. Approximately 92% of the population are Hindu and the rest are Moslem, Christian and Buddhist.

Around 70% of the population reside in rural areas. However, urbanization has been increasing during the last two decades. A significant proportion of young people have no interest in working in the agricultural sector. They prefer to work in the tourism or construction industries where the income is higher and the work is more 'reputable'.

Bali is governed by a governor and divided into eight *kabupaten*. *Kabupaten* are divided into *kecamatan* (sub-districts) and *desa* (villages). In Bali the *desa* is made up of a number of *banjars* which are neighbourhood or community groups, the smallest organization in the village. As well as the official (*dinas*) government there is also the traditional or customary (*adat*) government. The traditional village boundaries will usually, but not always, coincide with the official boundaries. The *banjar* is closely linked with the *adat* governance.

## The subak

As the *banjar* is the hamlet or settlement unit of Balinese culture the *subak*<sup>1</sup> is the traditional agricultural unit (Geertz 1967). The *subak* plays an important role in all aspects of individual and community life. Each *subak* has its own organizational structure, consisting of *subak* leader (called *pekaseh*), secretary, special task force, and members. All smallholders having land irrigated from the same source are obliged to be members. Only members are allowed access to irrigation water.

A role of the *subak* is in producing local rules (*awig-awig*) that must be followed by the whole community. It can also be used as a forum for the settlement of conflict that may arise between members. The *subak* is also responsible for the maintenance of all social and religious obligations of the members in relation to the cropping cycle and pest control. Planting rotation, type and variety of commodities planted, as well as the inputs used are also organised by *subak*. Technical responsibilities include the construction and maintenance of irrigation facilities as well as the equitable distribution of water to all members.

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1 *Subak* means an 'irrigation society' and has a central role in the regulation of irrigation water. It is the area fed by a single dam and major canal. However, it is much more than this. The *subak* is also an agricultural planning unit, an autonomous legal corporation and a religious community (Geertz 1967, p.79). Apart from the house plot all irrigation decisions in the community are governed by the *subak*. The need for this control originated from the dependence of individual irrigators on the goodwill of their neighbours. Geographically the *subak* is an irrigation system where all members must work together to ensure equitable and efficient delivery of irrigation water as required.

At a community level the *subak* is responsible for mobilizing members' contributions in order to maintain public facilities. The *subak* also acts as a cropping input wholesaler, providing members with subsidised inputs. The *subak* does not, however, provide marketing support. Most smallholders prefer to sell their produce using the *tebasan*<sup>2</sup> system. Smallholders get paid in advance and do not have to be involved in the harvest or post-harvest activities.

Throughout most of Bali the *subak* system is still strong, although urban pressure and increasing off-farm opportunities are threatening its relevance and vitality. The traditional strength of the system has been used by the government when implementing various development programs, such as rice intensification, credit scheme, irrigation development/rehabilitation projects, etc. The utilisation of this traditional institutional structure is partly responsible for the more rapid adoption of new farming practices in Bali compared with other parts of Indonesia.

### *Land tenure*

Because of the high proportion of the population living in rural areas agriculture remains the dominant employment sector in Bali. However, plot size is small and over the years has become smaller as the population grows and the plots are further divided between family members. Between 1993 and 1998 the number of households owning land less than 0.5 ha increased from 160,000 to 170,000.

It is difficult to support a household (average size between five to seven members) with less than one hectare of land. This situation forces the smallholders to sharecrop or rent extra land as well as seek off-farm income. Traditionally, the landlords were members of the local royal families. Smallholder land tenure status can be classified as owners, owner-tenants or sharecropping/tenant smallholders.

In irrigated agriculture, most of the smallholders are forced to be both landowners and tenants. In upland agriculture, however, especially for estate crops, sharecropping is rarely found.

### *Labour mobility*

Associated with the small land holding, off-farm use of the smallholders' labour is highly significant. The seasonal nature of agricultural activities leaves the smallholders with sufficient time to seek off-farm work. The rapid development of the island, notably through tourism and other urban activities, opens a number of opportunities for smallholders to use their labour productively.

The construction sector absorbs the largest proportion of unskilled, excess labour. The production of traditional crafts (wood and stone carving, gold and silver jewellery, etc) also absorbs a significant portion of a smallholder's labour. This is especially true in the tourist areas around Denpasar and Ubud.

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2 A *tebasan* system is one where the grower will sell the crop to a buyer before harvest. A yield estimate will be agreed to by both parties and the buyer will then be responsible for harvest and transport.

In the last two decades, there has been a significant shift in the allocation of labour from agricultural to the non-agricultural sector, most notably into the tertiary sector (tourism, trade and services). In 1971, agriculture employed 68% of available labour. This percentage decreased to 45% in 1990 and to only 33% in 2000. On the other hand, the role of the tertiary sector in labour absorption has steadily increased, from 24% in 1971, 34% in 1990 and 44% in 2000.

It is worth noting, however, that although off-farm income is high, smallholders still identify themselves as farmers and farming households. Farming seems to be not only an occupation, but a way of life. Balinese tradition and culture encourages this perception.

### *Gender roles*

There is not a significant division of labour between men and women. All household members are involved in general farming activities (e.g. planting, weeding, fertilizing, harvesting, transport), as these activities do not need special skills. In rice farming, however, men tend to undertake activities that require more strength such as planting and transplanting. Weeding, on the other hand, tends to be undertaken by women. In recent years, labour has been imported from East Java or Lombok to do the harvest. The workers are paid as contractors (incurring *borongan* costs).

In livestock management, there is no significant difference in the roles of women and men. While men are generally responsible for cattle management it is not uncommon for Balinese women to have this responsibility. Likewise, while pig feeding is generally done by women, men do not hesitate to do the job. Domestic work, such as cooking and house keeping, is exclusively a role for the women.

### *Communication and transport*

Bali is one of the most developed provinces in Indonesia. Paved roads link all villages. Unpaved roads are only found in the *subaks* and linking isolated *dusun*. However, infrastructure related to post-harvest technology such as cold storage, refrigerated transport, etc. is not available to smallholders in Bali.

Most agricultural areas have good access to urban markets. They also have access to market information and daily price estimates on which to base their planting and marketing decisions. For small scale trading, each village also has a local market.

Communication facilities are also available in every *dusun*. Every *dusun* has at least one public television, located in the *dusun* hall. This was assisted by a specific government program implemented in the 1980s. The use of television in agricultural extension, however, is low. To access commodity price data, farmers usually use the local radio, newspapers and neighbours.

Banking facilities are generally available at the village level. However, these tend not to be used effectively because smallholders are dissuaded by strict borrowing

rules as well as the need for collateral and perceived bureaucratic complexities. Banking facilities are more often accessed when the government implements special smallholder development programs that require or encourage the use of credit, e.g. agricultural intensification, food security and small-scale rural industry programs.

### *Provincial government policy and agricultural development*

The vision for agricultural development for Bali is to develop modern, strong and efficient agriculture. In achieving this the objectives of agricultural development are to:

1. increase the income and welfare of farmers;
2. increase food security;
3. produce agricultural products that are internationally competitive;
4. provide employment, increase productivity and wider opportunity to develop relationships with agribusiness; and
5. increase a smallholder's self-reliance and improve agricultural institutions and infrastructure.

Between 1975 and 1992 the priority for agricultural development was food security with particular attention being paid to rice production. In order to achieve self-sufficiency the Indonesian Government strictly regulated the cropping patterns of smallholders in irrigated areas. Although Bali achieved self-sufficiency in rice production in 1979 it was not until 1992 that farmers had freedom to decide what and when to plant. This has led to the introduction of different crops and vegetables such as watermelon, paprika, chilli and cucumber, commodities that have the potential to provide higher returns than traditional crops.

The government provides significant support for smallholders in the form of free extension services. Extension workers provide technical advice on crop and livestock production and market analysis. To fund this support smallholders are required to pay land tax. The land tax is determined by quality and quantity of land owned and this varies region by region.

Land ownership in Bali is regulated by the 'agrarian law' (National Act No.5/1960). The main points of this act are: land rights are differentiated into ownership right, right of use, right of management, right of building use, right of lease, etc; ownership right can be inherited; and, only citizens have the right to own land<sup>3</sup>.

At present, the Bali provincial government has no policies designed to encourage agribusiness companies to invest in Bali. At the same time, there is not significant interest by investors to become involved in commercial agriculture in Bali because of a perception of high risk as well as high labour and land costs compared with other parts of Indonesia. In Bali in particular, the tourism and small business export sectors attract significantly more interest for entrepreneurs than does the agricultural sector.

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3 This has now been changed so that in Bali foreigners can now own land in their own right.

## Agricultural commodities

The potential success of contract farming in any area will be influenced by the existing farming practices, social groups and customs, and the commodities produced. To understand contract farming in Bali, therefore, it is necessary to understand the agricultural context within which it will be set.

### *Rice and other irrigated crops*

Rice is by far the most important crop grown in Bali, both from an economic and social perspective (Tables 1 and 2). The island of Bali, although small in size, has always been a major supplier of rice to other regions of Indonesia. Bali was known as the rice production centre of the Indonesian archipelago. Rice is the staple food for most Balinese. Traditionally, ownership of irrigated rice fields was the most important indicator of wealth in Bali. It also conveyed status and prestige to the owner. So important was (and is) rice in Balinese life, that the social rituals surrounding the rice lifecycle mirror those of the human lifecycle.

The other major crop grown in these irrigated areas is maize, which until the 1970s was a significant food crop. More recently, maize has become a useful break crop to be used in a rice-rice-other crop rotation. Other less important crops used in rotation are peanuts, soybean, onion and ground nuts. Apart from soybean the production of staple commodities in Bali increased between 1970 and 2000. Improved rice varieties and government encouragement led to smallholders substituting rice for soybeans.

**Table 1.** Total production of staple food, Bali, 1970–2000.

Year	Rice (ton)	Maize (ton)	Ground Nut (ton)	Soybean (ton)
1970	279,919	59,091	8,496	8,173
1975	316,699	44,372	7,245	13,798
1980	570,091	84,024	15,832	9,311
1985	495,804	67,940	15,418	18,396
1990	587,185	117,460	14,998	32,812
1995	840,564	91,704	15,923	28,887
2000	852,634	94,761	17,397	12,950

Source: Provincial Agriculture Services, Bali, 2001.

**Table 2.** Production of selected agricultural commodities, Bali, 2000.

Commodity	Production (tonnes)
Rice	852,634
Cassava	204,188
Sweet potato	62,129
Maize	94,761
Ground nut	17,397
Soybean	12,950
Garlic	1,525
Onion	1,920
Potato	6,384
Cabbage	53,961
Tomato	26,880

Source: Provincial Agriculture Services, Bali, 2001.

### *Dryland production*

There are various alternative food crops grown in the dry and upland areas of Bali. These include cassava, sweet potato, a variety of beans and yam. Bali also produces a variety of fruits. Among the most important are mango, rambutan, papaya, orange, banana, snake fruit and watermelon. Vegetables have become increasingly important with the development of the tourism industry. Important vegetables grown in Bali include garlic, onion, potato, cabbage, chilli and tomato. These newer crops are not yet fully integrated into commercial farming systems. Most are grown in traditional small-scale systems that do not satisfy the quantity and quality demands of the tourism sector.

## Farming systems and smallholders

The average land holding in Bali is less than 0.5 hectares. This makes it difficult for smallholders to grow commercial crops. Instead they tend to be forced into subsistence style farming systems. There has, however, been success particularly in upland agriculture in producing export-oriented commodities such as clove, ginger, coffee, cacao and vanilla. These have often been established through Indonesian Government programs. Unfortunately, declining commodity prices

because of increasing overseas competition and disease problems (e.g. *Fusarium* in vanilla) have led to a decline in some of these industries.

In the irrigated areas, new tourism market-oriented commodities are being introduced and adopted. Since the 1970s, the production of horticulture products has increased (e.g. carrot, tomato, potato, paprika and lettuce). However, these are limited to the higher altitude areas.

## Commodities grown under contract in Bali

Contract farming is a new concept for Bali. However, similar or equivalent practices have been used in the past. Formal written contracts have not been common due to literacy issues and strong community pressure to satisfy verbal agreements. The basis of the contract has been an oral agreement, or mutual understanding.

A formal or informal contract is increasingly being adopted where non-subsistence market-oriented commodities are being grown. At present, contracts involve farmers and traders, groups of farmers and the tourism industry, and farmers and agricultural institutions.

For a number of reasons, in particular high labour and land costs, contract farming is not as widespread in Bali as in other parts of Indonesia. Successful examples include contracts to grow seed rice, seed corn and broiler chickens. There are also examples of less formal partnerships that are successful. These include farmer cooperatives and traders supplying fruit and vegetables for the tourist and supermarket sectors. There are also examples of contracts that have not continued due to factors such as the Asian economic crisis, problems with continuity, quality and quantity of supply and competition. These examples have tended to occur in the businesses attempting to export primary production into other Asian countries. The following discussion highlights examples of contracts and partnerships, where some have proved successful and others not.

### *Rockmelon*

Since 1993, an entrepreneurial smallholder in *Desa Bona* (*Kabupaten Gianyar*), has organised his fellow smallholders to plant rockmelon in their irrigated areas. He provides credit to his fellow smallholders and purchases the production at the market price. He has convinced the smallholders that the commodity is marketable and has an economic value. He channels the produce to local hotels and restaurants and sends it to Jakarta.

There is no written contract and participation is voluntary. He merely organises farmers to plant rockmelon, facilitates credit and gives an assurance that he will buy the produce. However, he does not bear the risk of crop failure. Up until now only rockmelon has been produced. The entrepreneur tried to encourage the growing of tobacco, but due to climate and crop management issues this was not successful.

### Seed corn

In September 2000, the leader of *subak* Palamerta (*Kabupaten* Jembrana) signed a contract with the manager of PT Sang Hyang Sri to produce certified seed corn. The *subak* was required to plant 65 hectares of seed corn (Bisma variety) and had the responsibility to deliver the laboratory tested product to PT Sang Hyang Sri. The *subak* also had to ensure that the technical advice provided by PT Sang Hyang Sri was implemented. In return, the *subak* (farmers) were entitled to a guaranteed market and price (Rp.2500 per kilogram) and free technical advice.

Mediation in case of disagreement was provided by the *kabupaten* level department of agriculture. The contract, apart from being signed by the two parties was also endorsed by the head of the district (*Camat*) and the director of the office of agricultural services, *Kabupaten* Jembrana. This contract arrangement is still active in Bali.

### Young ginger

In 1994, there was a growing Japanese demand for ginger, especially the young ginger tuber. It was predicted that more than 100,000 tons of young ginger would be required annually in this lucrative market. Climatically, Bali is considered suitable for ginger planting. Importantly, the land required for ginger is non-irrigated land, so there would be minimal competition with rice. Realising the potential demand and land suitability, a Japanese company (through an Indonesian subsidiary PT Indohorti Jahe Pratama) invested heavily in a ginger cannery in *Kabupaten* Bangli.

As young ginger was a commodity that smallholders had no experience in growing, PT Indohorti provided incentives for smallholders to grow it. They provided free technical assistance and a guarantee to purchase all production at an attractive price. This was all detailed in written contracts with individual smallholders. In the original contract with 145 smallholders in 1994 PT Indohorti agreed to provide all inputs (seed, fertiliser and pesticides). The farmers were required to produce two categories of ginger: young ginger (3–4 months) and old ginger (8–9 months). The price of the young ginger was guaranteed at Rp.1500 per kilogram and old ginger at Rp.2500 per kilogram. The young ginger was ‘corned’ for export, while the old ginger was used for seed in the next planting season or for other smallholders.

Between 1994 and 1996, ginger farmers experienced high returns. The income earned by ginger farmers was much higher than for other crops. However, in 1997 the ginger was hit by the disease *pseudomonas* and increased competition for the Japanese market by Chinese producers. In 1998, the contract ended and, while ginger is still being produced, indications are the factory will formally close in the near future.



### *Horticulture — cooperative*

In 1994, 68 smallholders in *subak* Pangyangan, (*Kabupaten* Jembrana) began planting vegetables and horticulture commodities for local consumption. In 1998, they formed a company UD. Cempaka Tani and became more involved in selling produce to the tourist areas of Bali. The main commodities planted were watermelon, rockmelon, cucumber and snake-bean.

While this group sells to supermarkets, hotels and restaurants there is no formal contract between them. The group itself functions as a cooperative and provides assistance in planting decisions (based on market information provided by the Department of Agriculture), supplies inputs (seed, fertiliser and pesticides) and assists with collective marketing.

The group has been driven by an entrepreneur within the *subak* and is keen to expand into the export market. However, lack of experience, capital, foreign partners and understanding of foreign customs and quarantine regulations has limited this development. At this stage the informal relationship that the group has with the tourist sector in Bali is providing adequate and risk-free market access. They have no desire to expand the number of members by including neighbouring *subak*.

### *Horticulture — sub-terminal*

The Bedugul area, in *Kabupaten* Tabanan, is the centre of horticultural production in Bali. Smallholders in this region are growers of horticultural produce of the quality demanded by tourism sectors. The products include lettuce, leek, potato, cauliflower, Chinese cabbage, carrot and paprika (chilli).

In the past smallholders have sold their produce as individuals. This has led to high transaction costs (transport, market information collection) that have put smallholders in a weak marketing position. It has also meant that hotels etc, had to deal with many sellers, which also led to higher than necessary transaction costs.

In 2000, a marketing centre (Sub-Terminal Agribusiness (STA)) was established. The STA is a collection of seven farmer groups in the area (more than 100 members) involved with the production and marketing of horticulture products. The STA provides the following services:

- Before the planting season, with the help of the government office for agricultural services, the STA advises the farmers regarding the most feasible commodity to plant, the possible demand and potential competitors (from other regions in Bali and Java).
- The STA also provides credit for the purchase of inputs to the members, which is paid back at harvest. The payment can be in cash, but can also be in kind (agricultural produce, calculated at market price).
- The STA buys the members (and non-members alike) produce at the daily market price. Smallholders bring their produce to the STA's centre, in Batusea Market. Staff of the STA, (who are appointed from among the farmers) sort the produce based on quality. The price paid will depend on quality.

- The STA transports and sells the produce in the Denpasar market. On average, 60% is absorbed by hotels/restaurants, while private households purchase the remainder.

Once again this system is not a formal contract but the relationships and trust developed are ensuring that increased benefits are flowing to both the producers and the consumers.

### *Mangosteen*

Mangosteen (*manggis*) is a tropical fruit well suited to the Bali climate. Demand for this fruit is rapidly increasing in Asian markets such as Hong Kong and Taiwan. One Balinese company presently exporting mangosteen is PT Moena Farm. This firm has developed strong links with a Taiwanese business partner.

To encourage larger-scale production, PT Moena Farm has had to provide assistance to smallholders who wish to be involved in the contract. PT Moena Farm provides assistance in tree planting and maintenance, agrees to buy the fruit and provide sorting, grading, standardisation, and packaging services. Once again the relationship worked well for a while but problems caused by the Asian economic crisis, continuity of supply and the longer-term nature of tree crop production has led to this relationship being suspended.

### *Broiler chicken*

Another example of contract farming functioning successfully in Bali is the production of broiler chickens. The contract is between PT Nusantara Unggasjaya (NUJ) Bali and individual smallholders in the *Kabupaten* of Bangli, Badung and Tabanan. The contract started in November 1992 with 300 farmers involved. The company provides inputs such as day old chicks and feed that are paid for at sale. The growers have to build the chicken shed and associated equipment as well as providing a steady supply of electricity. The company also provides some technical and management expertise.

Both parties sign contracts that stand for seven periods of production. Each period is approximately 40 days. Termination by each party is possible if the contract is broken. For example, the company can terminate the contract if the farmer fails to produce the expected outputs during two consecutive production periods because of poor management. Likewise, the farmer can also terminate the contract if the company does not provide the inputs needed.

The company guarantees the market for the broilers. NUJ will collect and purchase the farmers' output at market price. Broilers are sold live in the market or processed into chicken products for domestic consumption.

### *Seed rice*

Contracts to grow seed rice are offered by various private and semi-government firms. PT Pertani is a semi-government institution that first offered contracts to smallholders in Bali in 1997. The first contract involved 13 *subak* throughout the six *kabupaten* in the province. This contract has been successful and was selected as a case study that warranted detailed examination.

## Case Study 1: PT Pertani — Seed Rice

### *National level*

PT Pertani is a government-owned agribusiness firm centred in Jakarta. The Indonesian Government established it in the Sukarno era to provide certified seed to smallholders. It produces seed in all provinces for crops including soybean, corn, rice and peanuts. Apart from providing seed PT Pertani also provides a rice milling service to contracted farmers.

The firm was established in 1959 under the State Emergency Ordinance No 1 (*Perusahaan Bahan Makanan dan Pembukaan Tanah — BMPT*). The company was named PT Pertani in 1998 (PT Pertani 2000). As a state owned enterprise, 65% of PT Pertani is owned by the Indonesian Government. Its mission is to produce and deliver competitive agribusiness support to the agricultural sector.

While the head office is in Jakarta there are also five regional branches, 33 office branches, 63 marketing units, 28 seed processing units, 19 rice processing units and five agricultural machinery services units. The regional branches of PT Pertani are in North Sumatra, South Sumatra, West Java, Central Java, East Java and Sulawesi. Every regional branch has a responsibility to take care of the branch offices and the seed production centres.

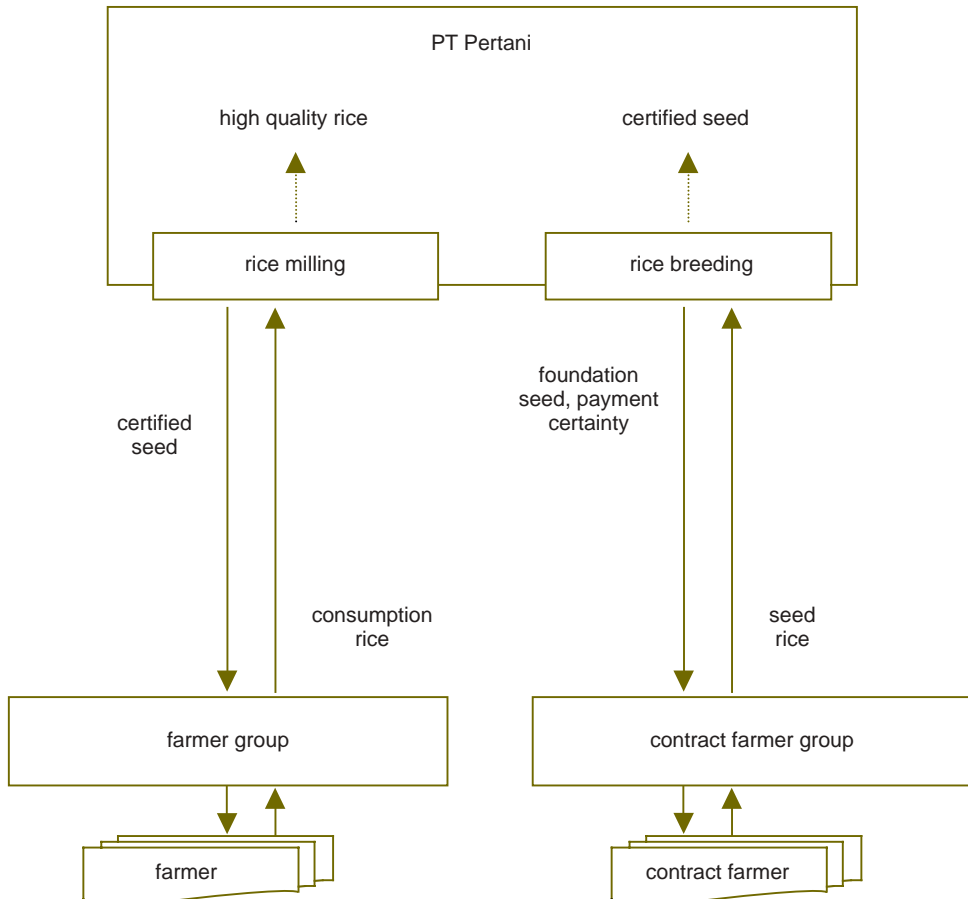
PT Pertani is answerable to the shareholders, with the Indonesian Government the majority shareholder. The Ministry of Finance has selected the director, boards and commissioners. In terms of responsibilities, head office is responsible for capital formation and accumulation while distribution, production and marketing are organised by the regional and branch offices. PT Pertani employs 1150 workers throughout Indonesia (PT Pertani 2000).

The rice breeding component of the company first contracted farmers in 1986. By 2003 there were 26 rice breeding units contracting 20,000 hectares throughout Indonesia. The rice milling service is not widespread as smallholders often use their own or other private units. The relationship between PT Pertani and smallholders is detailed in Figure 2.

### *PT Pertani in Bali*

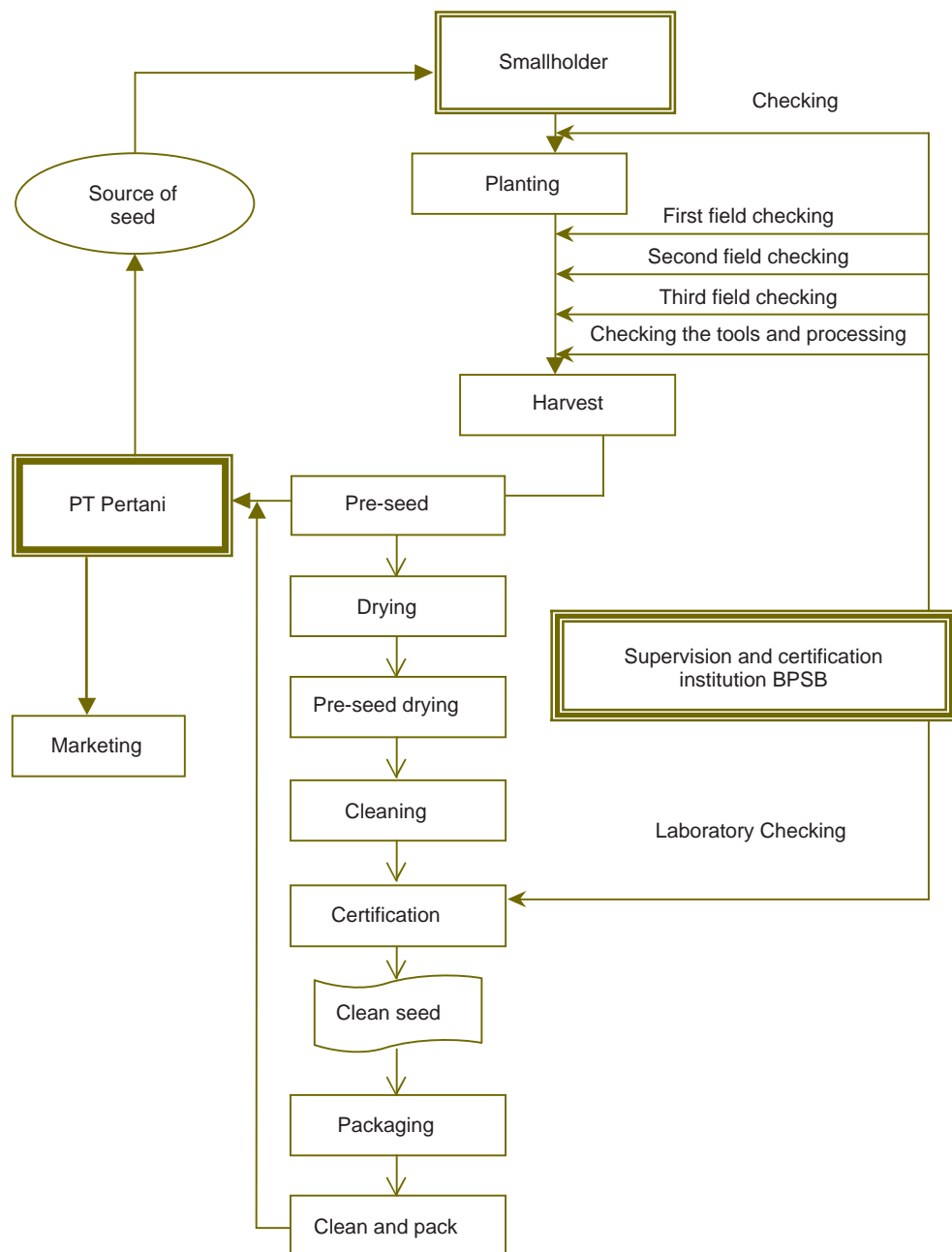
Production of seed rice by PT Pertani (Bali) was about 2000 tonnes last year with about half sold in Bali and the remainder distributed in East Java. As well as producing and selling seed under contract the company also sells fertiliser and pesticides to smallholders. PT Pertani is government-owned but not subsidised and is expected to break even at both national and provincial levels.

Since the start of the rice seed contract in Bali in 1997, the number of smallholders under contract has varied between 200 and 300. All growers must be certified seed producers to participate in the contract. Certification is undertaken by the government organisation *Balai Pengawasan Sertifikasi Benih* (BPSB), which requires smallholders to undertake training prior to certification. About 5% of Balinese smallholders are certified for seed rice production and PT Pertani faces considerable competition from private producers of seed rice.



**Figure 2.** Contract farming system; PT Pertani.

The relationship between smallholders and PT Pertani and the functions and responsibilities of the stakeholders are detailed in Figure 3. The PT Pertani contract terms are relatively simple. Smallholders are provided with free foundation seed and extension advice and must deliver at least 75% of production to PT Pertani. Up to 25% of production can be retained for the smallholder's own use. Diversion of any portion of the seed production to other markets is forbidden. Payments are made in cash by PT Pertani to the *pekaseh* and, since 2001, no advances of farm inputs or cash have been provided. In 2001 the contract was altered to take advantage of special government provisions where Bank Mandiri provided credit for farm inputs. The bank advanced money to PT Pertani which then advanced farm inputs to the *pekaseh* for distribution to growers. There are no cash advances prior to harvest to the *pekaseh* or growers.



**Figure 3.** Contract farming mechanism, production process and seed certification.  
Source: Diana, R. 2003.

Smallholders usually receive four visits during the growing season from BPSB extension officers who are paid to undertake an advisory and monitoring role. Visits occur at land preparation 30 days after sowing, then at 40–60 days at the pre-flowering stage and then a week prior to harvest. Quality is important and about 15% of contracted production is rejected following visual inspection prior to harvest. Rejected production is subsequently sold as consumption rice.

Husbandry for seed rice is similar to that for consumption rice in terms of water use and weeding. However it is more labour intensive and requires high quantities of quality fertiliser, resulting in a yield premium of around 20%. Crops usually harvest six to seven tonnes per hectare and smallholders receive the spot consumption price plus 5% which was Rp.1400 per kg last season. Other private firms and individuals produce seed rice, the price of which in the spot market last season was Rp.3000 per kg. Although prices paid to PT Pertani smallholders were lower than this, PT Pertani reported that smallholders saw the costs of the price discount being offset by other benefits provided by company and associated government agencies. These include free foundation seed, seed processing and drying (producers did not have to own their own drying equipment), a guaranteed market and provision of extension advice. The cost of these services was Rp.2250 per ha, a token charge imposed by law by BPSB.

Understanding the role of the *pekaseh*, who is in charge of each irrigation area, is critical in understanding this contract. PT Pertani contracts only with the *pekaseh* who represents the interests of 50 to 60 smallholders participating in the contract in his area. PT Pertani negotiates with the *pekaseh* over the desired land area and the contract is signed only by the *pekaseh*, not by growers. Payments for delivery under the contract are made in cash to the *pekaseh* who distributes it to the growers. The manager at PT Pertani said the *pekaseh* chose the cropping allocation for the whole irrigation area (*subak*) in terms of area of seed rice, consumption rice and soybean, leaving only minor production decisions to individual smallholders. He also expressed the view that many contracted smallholders did not actually know to which firm (if any) they were contracted. There was a high level of co-ordination amongst growers and, in some senses, the *subak* could be viewed as a single decision making unit.

Analysis of the survey data, discussed below, indicated that the seed rice contract had no significant impact on productivity of farm capital. In terms of the possible welfare gains from contracting outlined in the previous section, the main benefits are in risk management and improved access to markets. The seed rice market is a mature market where the only barriers to entry are the requirement for certification as a seed producer and access to drying facilities. Except in the previous season, where contractors could use the contract to access government subsidized credit, only foundation seed is advanced under the contract and makes little contribution to overcoming credit constraints. The contract provides extension and would overcome problems associated with lack of information, however, since husbandry for seed rice is similar to that for consumption rice and

because the certification process includes a training component, the benefits here are limited. The major advantages of the contract for smallholders are in reducing risk. They receive an assurance their product will be purchased at harvest and, also, contracted production constitutes a form of diversification.

There may also be benefits to the community in the longer term. Cooperation with government and agribusiness may improve the chances of future partnerships and access to government programs. The development or maintenance of networks by the community may lead to significant future opportunities/benefits.

## Data analysis

### *The study area*

There were 180 smallholders selected from *Kabupaten* Badung and 120 from *Kabupaten* Gianyar. *Kabupaten* Badung encompasses the tourist centre of Kuta and the city of Denpasar. The survey participants were selected from five *subaks* within this area. *Kabupaten* Gianyar includes the tourist centre of Ubud but is not as close to the heavily populated areas in Denpasar. There were three *subaks* included from *Kabupaten* Gianyar.

Smallholders were interviewed by BPTP Bali, with assistance from University of New England and Udayana University staff. Of the 300 smallholders surveyed 150 were participating in a contract with PT Pertani to grow seed rice.

### *Description of the data*

#### HOUSEHOLD CHARACTERISTICS

Survey participants were generally homogeneous with regard to household characteristics (Table 3 summarises the major results). All 300 households had a male as head with ages ranging from 22 to 80 years. The average age of the household head was 48 years.

Education levels are improving amongst smallholder communities. Ninety-two per cent of households had a member who had completed senior school, whereas household heads had an average of 6.1 years of formal schooling and 15% had no formal schooling.

The average household size was 4.9 persons with 22% of household members aged less than 14 years or more than 65 years. With minimal government welfare support available, the community, and more particularly the family, takes responsibility for the care of the young, elderly and the unemployed. Family and community ties are still strong in Bali.

Borrowing and saving are important components of household management and there were no significant differences between contractors and non-contractors in this regard. Twenty-seven per cent of households reported having savings and

41% had borrowed from financial institutions, family or friends in the previous two years. The only significant difference between contractors and non-contractors is the land under management with contractors managing significantly more land than non-contractors.

**Table 3.** Characteristics of smallholder households, Bali.

		Total Sample Means	Contractor Means	Non-Contractor Means	Test
Household characteristics	Age of household head (years)	48.0	47.9	48.1	0.2
	Education of household head (years)	6.1	6.0	6.2	0.6
	Education of family member (years)	7.7	7.8	7.6	-0.7
	Dependency percentage (%)	22.0	21.0	23.0	0.9
	Number of persons per household	4.9	5.0	4.9	-0.3
	Land managed by household (years)	0.4	0.46	0.37	-2.7***
Community links	Group membership (no.)	2.7	2.7	2.6	-0.8
	Spent on community activities (Rp.m)	2.5	2.6	2.3	-0.9

Test of difference between contractors and non-contractors using t-test or Pearson  $\chi^2$  as appropriate.

\*significant at the 90% level, \*\*significant at the 95% level, \*\*\*significant at the 99% level.

There were no significant differences in smallholder group membership or community participation between contractors and non-contractors. Participation in community activities, including religious (predominantly Hindu) ceremonies and family obligations, are important in Bali society and require significant financial commitments. Contractors and non-contractors alike spent an average of Rp.2.5m annually on community activities, over half their annual farm income.

#### ASSET OWNERSHIP

The most common household assets were motorbikes and televisions with 55% of households owning one motorbike and 29% owning two or more (Table 4). Seventy-three per cent of households owned a television with 9% having two or more. Only 9% of households owned a car. The average total value of non-agricultural assets



was Rp.14.1m. There was a significant difference between contractor and non-contractor groups in terms of non-agricultural asset ownership. Contractors, on average, owned non-agricultural assets valued at Rp.15.9m compared with Rp.12.4m for non-contractors. There was no significant difference in the value of agricultural assets such as pumps, mattocks and hand sprayers.

**Table 4.** Asset ownership of smallholder households, Bali.

	Total Sample Means	Contractor Means	Non-Contractor Means	Test
Total value of agriculture assets (Rp.'000)	394	412	375	-0.2
Total value of non-agriculture assets (Rp.m)	14.1	15.8	12.4	-1.7*
Area of land owned (ha)	0.28	0.31	0.26	-1.6
Area of land rented (ha)	0.13	0.15	0.11	-1.7*
Area of land owned and rented (ha)	0.41	0.45	0.37	-2.7***
Area of irrigated land worked (ha)	0.37	0.41	0.33	-3.0***
Quality of house (3 = excellent, 12 = poor)	4.1	4.0	4.2	0.58
Quality of sanitation (% with good facilities)	73	75	72	-0.75
Households borrowing in last 2 years (%)	41	39	43	0.6
Smallholders who have savings (%)	27	25	29	0.5
Value of livestock (Rp.m)	4.0	4.4	3.6	-2.0**
Value of all assets (Rp.m)	310	333	286	-1.4

Test of difference between contractors and non-contractors using t-test or Pearson  $\chi^2$  as appropriate.

\*significant at the 90% level, \*\*significant at the 95% level, \*\*\*significant at the 99% level.

The quality of housing is high in Bali with 97% of respondents having a household bore and all but one smallholder having mains electricity. The continuity of electricity supply is improving with 85% of households having access to electricity more than 95% of the time. Each household owned the house they lived in but no others. Balinese have a strong tradition of handing down land to all their children, not to just one child, resulting in smaller blocks and greater need to obtain off-farm income.

The survey focused on irrigation areas and 75% of households did not own or operate any dryland plots. While contractors and non-contractors own similar

areas of land, 0.31 ha and 0.26 ha respectively, contractors rent in more land leading to more irrigated land worked by contractors compared with non-contractors (0.41 ha compared with 0.32 ha) and more plots worked (1.7 compared with 1.4). In terms of irrigated land, smallholders work 1.3 plots totalling 0.37 ha. Seventy per cent of smallholders work 0.4 ha or less and average plot size is only 0.27 ha. Because of increasing pressure from tourism the value of land in Bali is very high and the reported value of land worked by households averaged Rp.400m.

Livestock play a significant role in a smallholder's social and economic life. Cattle are regarded as a status symbol and a form of savings as well as being used for productive purposes (draft and breeding). Chickens, ducks, pigs and goats are also used as sources of income and investment. In these intensive cropping areas, livestock also tend to be managed intensively with cattle hand-fed and stalled near the house. Contractors tend to own more livestock than non-contractors. The average value of livestock owned by contractors was approximately Rp.4.4m compared with Rp.3.6m for non-contractors. This meant more labour use in livestock enterprises and income from this source.

#### GROSS MARGINS (PER HECTARE)

The gross margins per hectare calculated for the dominant crops (Table 5) support the hypothesis that seed rice is regarded as just another variety of rice rather than a special crop and that smallholders substitute rice with seed rice. Substitutability is supported by the fact that only 33% of contractors grow non-seed rice, while there is only one non-contractor who did not grow rice in the last 12 months.

On the gross margin evidence provided by smallholders it is interesting to note that seed rice has a lower average gross margin than rice and contractors have significantly higher rice gross margins than non-contractors. Whether this is due to PT Pertani selecting better farmers to be contractors or whether contracting has made them better farmers is unclear at this stage. It may be that only the bigger contractors have the area to grow both rice and seed rice and these farmers will tend to be more efficient than smaller farmers.

The only other major crop grown by these smallholders was soybean. There was no significant difference in soybean gross margins between contractors and non-contractors and the gross margins are considerably lower than for rice and seed rice.

In terms of variable costs there are significant differences between the two groups of smallholders (Table 6). Non-contractors spend more on crops per hectare than contractors. Non-contractors use more non-family female labour, while contractors use more male family labour. The reasons for this are unclear at this stage. The use of contract labour is very important in Bali particularly in the harvest of rice crops. It is common for contract harvesters (usually grain traders) to estimate yield of particular plots, pay an agreed value (seed value less harvest costs) and then sell the grain at the market price. This system is common to both contractors and non-contractors.

**Table 5.** Crop GMs per hectare per season, contract and non-contract farmers, Bali.

	Rice		Seed Rice	Soybean	
	Contract farmer (Rp.000)	Non-contract farmer (Rp.000)	Contract farmer (Rp.000)	Contract farmer (Rp.000)	Non-contract farmer (Rp.000)
No. of growers	53	149	150	65	74
<b>Income</b>	<b>4,533</b>	<b>4,306</b>	<b>3,925</b>	<b>1,362</b>	<b>1,430</b>
Costs					
Chemical	679	725	607	328	417
Labour	527	708	632	141	132
Capital	44	76	45	0	2
Barongan	452	495	513	40	64
<b>Total Cost</b>	<b>1,702</b>	<b>2,004</b>	<b>1,797</b>	<b>509</b>	<b>615</b>
<b>Gross Margin</b>	<b>2,831</b>	<b>2,302</b>	<b>2,128</b>	<b>853</b>	<b>815</b>

*Barongan* costs are contract services costs paid as a set fee.

**Table 6.** Crop costs, Bali.

	Total Sample Means	Contractor Means	Non-Contractor Means	Test
Chemical costs (Rp.'000/ha)	631	583	680	3.9***
Chemical costs (Rp.'000/ha) (non-contract crops)	606	514	680	4.7***
Total labour (hr/ha)	89	91	87	-0.6
Total family labour (hr/ha)	67	70	63	-1.3
Total non-family labour (hr/ha)	22	21	24	1.2
Female family labour (hr/ha)	22	23	22	-0.5
Female non-family labour (hr/ha)	7.7	6.5	8.9	1.8*
Male family labour (hr/ha)	43	47	40	-1.8*
Male non-family labour (hr/ha)	15	14	15	0.4
<i>Barongan</i> (Rp.'000/ha)	431	430	432	0

Test of difference between contractors and non-contractors using t-test or Pearson  $\chi^2$  as appropriate.  
 \*significant at the 90% level, \*\*significant at the 95% level, \*\*\*significant at the 99% level.

## HOUSEHOLD INCOME

Higher land values, increasing off-farm labour opportunities plus smaller, less viable farms are changing the nature of agriculture in Bali. While heads of households still regard themselves as fulltime smallholders and their households as farming households more than 50% of available household labour was employed off the farm (Table 7). Most off-farm income was obtained from the non-agricultural sectors with over 80% from the service, construction and tourism industries. Only 2% of households do not receive off-farm income. Other sources of income such as remittances, pensions and other government assistance were minimal.

**Table 7.** Income sources of smallholder households, Bali.

	Total Sample Means	Contractor Means	Non-Contractor Means	Test
Total labour days spent off-farm	388	389	388	0.0
Total off-farm income using HH labour (Rp.m)	10.7	10.4	10.9	0.5
Total off-farm (Rp.m/hh)	10.7	10.4	10.9	0.5
On farm labour use, % of total	46	49	43	-2.2**
Seed rice (ha)		0.73		
Rice (ha)	0.48	0.23	0.72	8.2***
Soybean (ha)	0.17	0.16	0.17	0.3
Mixed crops (ha)	0	0	0	0
Tree crops (ha)	0.03	0.03	0.03	-0.2
Seed Rice (Rp.m/hh)		1.45		
Rice (Rp.m/hh)	1.17	0.67	1.66	4.8***
Soybean (Rp.m/hh)	0.14	0.14	0.14	-0.1
Total crop (Rp.m/hh)	1.34	0.88	1.83	4.4***
Total tree crop (Rp.m/hh)	0.11	0.11	0.10	-0.3
Total livestock (Rp.m/hh)	1.09	1.25	0.93	-1.0
Total farm (Rp.m/hh)	3.29	3.69	2.88	-1.9*

Test of difference between contractors and non-contractors using t-test or Pearson chi<sup>2</sup> as appropriate.

\*significant at the 90% level, \*\*significant at the 95% level, \*\*\*significant at the 99% level.

While non-contractors grow considerably greater areas of rice (0.72 ha in two crops over 0.36 ha), this is more than compensated for by contractors through their area of seed rice. This substitutability was confirmed by PT Pertani (the contracting company) who stated that farmers tended only to sell to PT Pertani the contracted amounts of seed rice even though the company will accept over the contracted quantities at a higher than market price. Farmers, however, tend to keep excess seed rice for personal consumption rather than selling it and purchasing consumption rice.

Contractors receive more farm income than non-contractors, although this is probably only due to the fact that contractors have more land under management. There are no other major differences between the two groups.

## Results

### FACTORS AFFECTING CONTRACT PARTICIPATION

In Bali the ownership of irrigated land was important in influencing who participates in seed rice contracts (Table 8). Age did not play a role in selection, although contract participants were more likely to be literate but were unlikely to have been educated beyond year three. In Bali there are increased opportunities for the younger educated household members to work in the tourism and construction sectors than in other parts of Indonesia. This difference in off-farm opportunities may also explain the inability of the model to predict a smallholder's status. In Bali the model correctly selected contractors from their characteristics 59% of the time.

**Table 8.** Results of probit analysis, Bali.

Age of household head (years)	-0.0049
Household head education only year 3	-0.1761**
Household head education > year 3	-0.1426
People in household 14–65 yrs	0.0051
Dry land owned and operated (ha)	0.0522
Irrigated land owned and operated (ha)	0.8609**
Value of agricultural assets (Rp.000)	0
Value of non-agricultural assets (Rp.000)	0
Value of livestock (Rp.000)	0
Credit constrained (yes = 0)	0.0372
Number of loans in previous 12 months	-0.0102
Number of groups in which household participates	0.0027
Number of agricultural groups	0.0709**
Expenditures on chemicals (Rp.000)	-0.0104

\*denotes 5% significance level.

\*\*denotes 1% significance level.

This may be because contractors are not selected as individuals but rather as groups. The individual smallholder and smallholding characteristics may not be as important as the group characteristics. Membership of agricultural groups meant a greater chance of contract participation.

#### THE EFFECT OF CONTRACTS ON HOUSEHOLD GROSS MARGINS

Smallholders in Bali who participated in the contract did not receive significant financial benefits from their participation (Table 9). The difference may be that markets are competitive for seed rice and the contractor does not have rents to share or, for that matter, any great need to share rents. Experienced, certified rice seed growers are plentiful and for this reason replacing contractors who do not renew contracts or comply with contract terms is not especially costly. It is evident that some growers did not realise they were contractors implying that, unlike in other commodity contracts, seed rice production methods are similar to those used for consumption rice.

**Table 9.** Results for gross margins, Bali.

Contract participation (zero-one)	-178.1
Age of household head (years)	-11.31
Household head education only year 3	-958.9*
Household head education > year 3	-947.9*
People in household 14–65 yrs	-139.9
Dry land owned and operated (ha)	646.4
Irrigated land owned and operated (ha)	6357.6**
Value of agricultural assets (Rp.000)	-0.13*
Value of non-agricultural assets (Rp.000)	0.007
Value of livestock (Rp.000)	0.369**
Credit constrained (yes = 0)	546.9
Number of loans in previous 12 months	-271
Constant	1042.3
R <sup>2</sup>	0.40

\*denotes 5% significance level.

\*\*denotes 1% significance level.

In Bali higher education decreases the profitability of smallholdings. This may be due to the greater opportunity for the educated to gain work off-farm and hence they place less emphasis on on-farm activities. It reflects the high opportunity value of educated smallholders' time in off-farm work and that farm production becomes less factor intensive when off-farm work is undertaken.

Livestock ownership has a positive effect on profitability exemplifying the more important role that livestock plays in Balinese agricultural systems.

### THE EFFECT OF CONTRACTS ON LABOUR USE

The seed rice contract in Bali had a relatively small effect on use of family labour on the farm and had no effect on use of non-farm or female labour or the amount of off-farm work undertaken by family members (Table 10). These results are not surprising since seed rice production displaces ordinary rice production and, while being somewhat more labour intensive, uses the same technology. The major determinants of demand for family labour were non-human capital items such as the number of irrigated hectares and value of livestock. Education and age reduced demand for household labour, and smallholders with more human capital were more likely to undertake off-farm work. The major alternatives to agricultural work for these smallholders are in the service, tourism and construction industries and, as expected, off-farm work was positively influenced by the number of adult

**Table 10.** Factors affecting on-farm demand for family labour, non-family labour, female labour and off-farm work, Bali.

	Family labour use	Non-family labour use	Female labour use	Off-farm work
Contract participation (zero-one)	26.93*	29.8	-0.2248	-3.049
Age of household head (years)	-2.144**	-0.055	0.1085	2.996**
Household head education only year 3	-52.56**	7.415	-0.0004	21.25
Household head education > year 3	-64.86**	1.196	-4.428	78.55**
People in household 14–65 yrs	5.272	2.338	1.101	77.17**
Dry land owned and operated (ha)	-0.7877	8.412	-11.62	148.73
Irrigated land owned and operated (ha)	98.08**	30.29**	33.8**	-73.68*
Value of agricultural assets (Rp.000)	0.0008	0.0005	0.0008	0.002
Value of non-agricultural assets (Rp.000)	-0.0003	-0.0001	0	0.002**
Value of livestock (Rp.000)	0.0249**	-0.0007	0.0015**	-0.0034
Credit constrained (yes = 0)	-9.212	-1.153	-0.6504	-2.752
Number of loans in previous 12 months	-31.79*	0.3748	-6.609*	28.11
Constant	289.97**	-8.853	31.01**	-84.03
R <sup>2</sup>	0.3889	0.1557	0.1475	0.2882

\*denotes 5% significance level.

\*\*denotes 1% significance level.

household members and inversely related to farm size. Age was significant in the off-farm work equation, possibly reflecting cohort effects since children of older smallholders were more likely to be of working age. Demand for non-family labour was positively influenced by farm size and for female labour by farm size and value of household livestock.

## Conclusions

Initial consideration of the survey results indicates that contractors regard seed rice as simply another variety of rice. During the formal interview process it became clear that many smallholders were unaware that they were defined as contractors. They were simply growing the variety supplied to them through the *subak*. The *subak* is the centre of their agricultural and community life. The nature of the irrigation system ensures that farming decisions are made as a group and individuals do not have control of irrigation water. Irrigation water is made available on a particular plot at a particular time. Water cannot be stored by individuals as this would influence water users further down the system. This overriding and necessary control of water by the group leads to individual smallholders becoming dependent on the group for other decisions such as what crop to plant. In many cases individual smallholders did not know what variety they were planting. They planted the seed provided to the *subak* often at the recommendation not even of the group but rather the *subak* leader (*pekaseh*).

The results indicate that with regard to a seed rice contract, participation was influenced by irrigated land ownership and group (*subak*) membership. The nature of the contracted commodity meant that no particular production or entrepreneurial expertise or attitude to risk was required. The characteristics of non-contractors and contractors were, therefore, similar. PT Pertani could have selected farmers with the required attributes from anywhere in Bali. Factors that may be important in these smallholders accessing the contract could be the attributes of the *pekaseh* (and maybe the village head), the distance and accessibility of the area and past experience in working with government and agribusiness. Instead of individual smallholder characteristics influencing participation it was community characteristics and social capital.



# 3

## Contracting in Lombok



## Lombok in context

### *The land*

Lombok is the major island in the province of NTB situated directly to the east of, and a short 20-minute flight from Bali. At its widest points the island is approximately 80 by 70 kilometres. The land is dominated by Mt Rinjani (the second highest peak in Indonesia at 3700 metres), which influences soil quality and rainfall. North and eastern Lombok are drier with less fertile soil. The volcanic central plains are fertile with consistent rainfall similar to the fertile areas of Bali. Rainfall is highly variable ranging from 700 mm in the east to more than 3500 mm in the centre. The south and southwest are also dry (as it is in Bali in the same areas) with regular drought and crop failures.

### *The people*

The population of Lombok is 2.8 million (KMNK 1999) with an annual growth rate of 2.3%, which is slightly higher than the Indonesian average. The population is unevenly distributed across the island varying from 30 people per square kilometre in the drier areas to 500 per square kilometre in the more fertile areas. In Mataram (the provincial capital) the population density increases to 5000 per square kilometre. The *Sasak* people, who are predominantly Muslim, are the indigenous inhabitants and make up 90% of the population. The remainder of the population are ethnic Balinese who have been in Lombok for many generations. They maintain their Hindu belief system and live in the western part of the island. There are small proportions of ethnic Chinese, Arabs, Javanese and people from the neighbouring islands of Sumbawa and Sulawesi. These groups include some Christians and Buddhists.

NTB's workforce is poorly educated (Tirtosudarmo 1996). In 1996, 65% of the urban population and 86% of the rural population did not proceed beyond elementary education. Poor education levels, a growing population and increasing landlessness are putting pressure on the agricultural sector to become more productive.

Agriculture is still the major sector, employing 52% of the labour force (BPS NTB 1998). Manufacturing is limited, contributing only 5% of the provincial GDP. The informal small business sector is important with the production of handicrafts (e.g. pottery, wooden artefacts and *ikat* — woven material) providing important non-farm income for both rural and urban dwellers. Tourism has been a growing sector, contributing 18% of GDP in 1997. Shocks and upheavals such as the political turmoil at the end of the Suharto era, Timor Lorosae independence and the terrorist bombings in New York and Bali have, however, had significant detrimental effects on the number of tourists visiting Lombok. With an

improvement in world stability tourism will be able to play a vital role in the development of Lombok.

### *Land tenure*

A rapid rise in the population (it has doubled since 1970) has had significant effects on the land tenure system in Lombok. The continual dividing of land between family members has shifted land tenure from a system of larger farms with shareholders and tenants to a system of subsistence-level smallholders and a mass of landless labourers.

### *Labour mobility and income*

NTB is the second poorest province in Indonesia with more than 55% of the population depending on subsistence agriculture and more than 20% living below the poverty line. The less developed tourist and industrial sectors, smaller urban centres and greater distance to markets in Lombok have ensured that there is less opportunity for smallholders to participate in new markets compared to smallholders in other provinces of Indonesia. There is also less opportunity to find non-agricultural work so unemployed (or underemployed) labour tends to remain on family farms.

The lower demand for labour from competing sectors, the high quality and the lower opportunity costs of land has made Lombok an attractive option for agribusiness firms. There is, in fact, more contracting occurring in Lombok than in Bali. Lombok's closeness to Bali and Java ensures that market access is still feasible.

### *Gender roles*

There is less opportunity for off-farm sources of income in Lombok compared to Bali, therefore a higher percentage of family labour is utilised on-farm and there tend to be higher levels of underemployment. As in the other provinces work is shared between men and women, but men generally take responsibility for cattle management and supervise cropping activities. Planting and harvesting are undertaken by both men and women.

### *Communication and transport*

Lombok has a lower population density and lower levels of manufacturing and service industries than Bali. This leads to less transport congestion and quicker travel times. Road systems are good with tarred roads linking all villages. A common form of transport for both goods and people is the *cidomo* (a horse-drawn cart), which sometimes causes problems on the roads because of its slow pace and constant stopping.

## Agricultural commodities

In terms of agricultural systems and opportunities, smallholders in Lombok have similar systems to those in Bali. The introduction of new varieties and improved input use through the green revolution allows smallholders in the more fertile areas to produce three crops per year instead of two. As in Bali, rice is the major crop grown under irrigation, with other crops such as corn and soybeans grown in rotation. Other important crops are coffee, coconuts, kapok, cotton, tobacco, cloves, vanilla and chilli.

## Firms involved in contracting smallholders in Lombok

### *Tobacco*

There are various domestic tobacco companies that use contracts to acquire product from smallholders in Lombok. One such company is PT Djarum. This firm has been offering contracts since 1987 and presently has contracts with 500 producers, who grow approximately two tonnes per hectare on a total of 1500 hectares. The area of land, and hence the number of smallholders, is determined by the head office staff in Java on an annual basis. PT Djarum has seven offices in Lombok and regards the island as an ideal place to grow tobacco. Not only is it an ideal climate but also smallholders in Lombok have more limited alternative employment opportunities and produce markets compared to places like Bali with its more developed tourism and construction sectors.

PT Djarum will enter into contracts with individuals or groups as long as the contracted area is at least two hectares. The crop is planted in March and harvested in September. The company will undertake some vetting of potential contractors and usually offer contracts to 75% of those who apply. Production costs are high (Rp.16.5m per hectare) so the firm will either provide credit or support the smallholder's credit application to the bank. The firm also supplies extension advice and one staff member for every 100 hectares in order to ensure that growers follow the defined standard operating procedures.

Farmers are required to deliver the dry leaf to the company, which is then graded (there are 23 potential grades) and delivered to Java for processing. The growers are guaranteed the costs of production and are paid 15–20% above the market price for their contracted production. If there is a crop failure because of poor management the company will allow the grower to pay off the debt through another crop with more stringent management control.

There are smallholders who grow tobacco out of contract but they then bear the full risk of crop failure and price variability.

## Seed rice

As in other provinces seed rice is grown in Lombok by various private and semi-government firms. This contract is similar to those discussed in the previous chapter.

PT Pertani started contracting growers in Lombok in 1985 when 25 tonnes of certified seed was produced. This was increased to 2000 tonnes by 1990 and has remained at this level since then. The industry is centred on 500 hectares (1900 growers) in East Lombok. Growers receive 30 kilograms per hectare of foundation seed from the *Balai Penelitian Padi Sukamandi* (BPPS) in West Java and credit through PT Pertani (2.5% interest for the 4-month growing period) in order to purchase inputs. Seed is planted during the wet season (*musim hujan*, MH) — October to January and in the first half of the dry season (*musim kering*, MKI) — February to May.

The significant difference between contracts in Bali and Lombok is that in Bali there is no support provided to growers apart from the provision of foundation seed, whereas in Lombok credit is provided to purchase inputs. The marketing system is also slightly different. In Bali the individual growers sell to a contractor (often the contractor is responsible for the harvest) who sells to the *pekaseh* who, in turn, sells to PT Pertani. In Lombok there is no contractor. The growers are directly responsible for the harvest and sell to the group leader.

## Cashew and seaweed

There are other examples of contracts between small domestic firms and smallholders in Lombok. One company, PT Phoenix Mas Persada, has been involved in trading cashews and seaweed products and other spices in Lombok for more than 10 years. Between 1989 and 1991 the firm provided assistance to smallholders to plant cashew trees. They paid for seed and provided payment on future production. With a tree crop that did not give a return for three to four years this was necessary to encourage production.

There is a total of about 4000 hectares of cashews in north Lombok that sells for Rp.5m per tonne. The benefit of growing in this area is that land and labour are cheap and the cashew trees do not require water. This area is one of the driest and poorest on the island. Since trees have begun producing, the firm has found its annual written contracts with smallholders do not prevent diversion of contracted production to other markets. There is increasing pressure from Indian buyers who are dealing directly with the growers. So, while the firm can compete with the new buyers, it is not able to offer any other benefits such as credit or down payments because growers may abuse the system. The relationship between the firm and particular growers is now built on trust rather than a formal contract.

The company also used a similar system to establish seaweed farms in Lombok. They assisted growers to become established but now rely on strong relationships

built over the years to maintain supply. They pay the market price and employ agents to collect the raw product and deliver to the factory in Cakranegara. Here they produce dry products and confectionery for export to other provinces and overseas.

The Asian financial crisis and the subsequent rise in input costs has harmed this business, while the decline in the value of the rupiah has encouraged other buyers to enter the market.

## Case Study 2: NUJ — Broiler Chickens

### *The company and market*

Nusantara Unggasjaya (NUJ) is a subsidiary of PT Charoen Pokphand, a Thai multi-national firm that produces poultry and pigs under contract and participates in livestock feed markets in Thailand, Indonesia, Malaysia and China. It has more than 70 enterprises throughout Indonesia with the Lombok broiler operation being its smallest, employing only 20 staff.

NUJ uses contracts with smallholders to produce around 10,000 broilers per day. It has operated on Lombok since 1998 and since then has carved out a stable market niche for broilers. When the firm was established in Lombok, daily consumption of *kampung* (village) chickens was around 5000. After five years of competition from contracted broiler production this figure has not changed, indicating strong market



*Smallholders provide chicken sheds built to company specifications.*

segmentation. An examination of prices for the two products supports this conclusion since *kampung* chickens, favoured in the local market for their tastiness, leanness and low chemical content, currently bring around Rp.18,750 per kg compared to broilers, which bring around Rp.5000 per kg. The firm claims the major competing product in consumption is wild fish, produced on a seasonal basis. All Lombok broiler production is consumed locally and the firm claims the market is 'mature' with little scope for expansion. Prices of fish and broilers appear to be interdependent and fluctuate quite widely. Interestingly, NUJ broiler production is currently operating at a loss with producers receiving around Rp.7000 per kg under the contract.

There are around 250 smallholders participating in the contract with around 2500 birds each at any point in time giving a total broiler production of approximately 600,000 birds in each cycle of production.



*All Lombok broiler production is consumed locally.*



*Each contractor has about 2500 birds at any one time.*

### *Contract description*

To enter the contract the smallholder must have available Rp.20m in capital in order to provide the necessary infrastructure (e.g. chicken shed) built to company specifications. Once in the contract they receive day-old chicks to rear to 1.8–2.0 kg liveweight, which takes 35–45 days depending on target weight. Production must follow the firm's guidelines with regard to input use and the firm provides extension and advice, day-old chicks (imported from nearby Bali), feed, veterinary products and other chemicals on a credit basis. No cash advances are made. Upon reaching target weight the chickens are delivered to the firm, which then sells them live directly to consumers. The firm does not process the broilers.

Growers currently receive about Rp.7000 per kg with the price determined by a cost-based formula where feed costs are the dominant item. The firm is dominant in its output market in Lombok and can doubtless exercise some market power. It would, however, be constrained in this activity by competition from Bali broiler and local fish production. It was not clear what type of power the firm could exert in the feed market or whether this was a source of monopoly rents for the firm. Growers are required to purchase feed from the firm, although they would be aware of feed prices in nearby Bali. This introduces an element of contestability since, if the firm were too 'out of line' with Bali feed markets, experienced contractors could, presumably, undertake ex-contract broiler production by sourcing feed from Bali.

Final payments to smallholders are made 14 days after delivery, after the value of inputs advanced has been deducted. Smallholders receive a cheque that they convert to cash in an 'over the counter' transaction at a bank. There appear to be few issues about product quality since, apparently, 'every chicken has its price'. That is, underweight or otherwise defective birds can be sold at a discount rate, with the discount passed back to the producer under the terms of the contract.

The firm claims contract participation is stable, there is a queue of smallholders wishing to participate in it and exits are restricted to about 3% of participants per year, who are asked to exit because of alleged dishonesty. The major problems reported by the firm are technical — such as unreliable electricity and difficulties in maintaining constant temperature — and issues about consistency of management.

The contract is negotiated directly between the firm and the grower and is not signed or witnessed by third parties. Contractors do not belong to any special groups specialising in broiler contracting and the only meeting of contractors is when the firm's extension officers talk to groups of 16 to 20 contracted smallholders.



## Data analysis

### *The study area*

The survey in Lombok was conducted in October 2002 by BPTP NTB, with assistance from staff from BPTP Bali and Udayana University. Two hundred smallholders were interviewed, comprising 120 non-contractors and 80 contractors, with respondents selected from all four *Kabupaten* in Lombok with 80% from the *Kabupaten* of West and Central Lombok. Only 13 respondents lived near the major residential areas of *Kabupaten* Mataram. Within these *kabupaten* respondents were selected from 20 *desa* within 11 *kecamatan*. One hundred and ninety six survey forms were usable with four being discarded for various reasons.

### *Description of the data*

#### HOUSEHOLD CHARACTERISTICS

There were significant differences between contractors and non-contractors in household characteristics (Table 11). There were differences in education levels and quality of sanitation and housing, with contractors generally better off than non-contractors. All except four household heads were male and ages ranged from 21 to 70 years, with an average age for contractors of 38 years, significantly lower than non-contractors at 43 years. There were no significant differences in household size between contractors and non-contractors, with an average of 4.1 persons. Age and dependency ratios were similar between the groups. Contractors had spent twice as long at school as non-contractors and 70% of contractor households had at least one member who had completed senior high school compared to only 20% in non-contractor households. In this sample the contractors are clearly younger and better educated than the non-contractors.

Participation in the broiler contract did not require membership of a particular group. Although the contracting firm provides extension advice to groups of producers as required, production is purely an individual activity. There was no difference in smallholder group membership between contractors and non-contractors. However, there was a difference in money provided for community activities where contractors give more in absolute, though not percentage, terms; 2% of annual farm income compared to 5% for non-contractors.

#### ASSET OWNERSHIP

Contractors had more non-agricultural and (non-land) agricultural assets than non-contractors, who owned slightly more land including significantly more irrigated land. Only nine smallholders owned cars with seven of these being contractors (Table 12). Likewise, with telephone use 14 contractors have mobile phones (18%) compared to two non-contractors (2%). All contractors have used a phone while

32% of non-contractors have not. Twenty per cent of non-contractors owned a motorbike compared to 78% of contractors. Contractors, on average, owned non-agricultural assets worth Rp.12.5m compared to Rp.3.2 for non-contractors.

**Table 11.** Characteristics of smallholder households, Lombok.

		Total Sample Means	Contractor Means	Non-Contractor Means	Test
Household characteristics	Age of household head (years)	40.7	37.7	42.7	3.0***
	Education of household head (years)	7.9	11.6	5.5	-9.4***
	Education of family members (years)	8.3	11.3	6.4	-10.7***
	Dependency percentage (%)	28	30	27	-0.7
	Number of persons per household	4.1	4.2	4.1	-0.1
	Land managed by household (years)	0.50	0.44	0.55	1.5
Community links	Group membership (no.)	0.58	0.61	0.55	-0.4
	Spent on community activities (Rp.'000)	396	515	319	-3.0***

Test of difference between contractors and non-contractors using t-test or Pearson  $\chi^2$  as appropriate.

\*significant at the 90% level, \*\*significant at the 95% level, \*\*\*significant at the 99% level.

In the same vein, the values of contractors' agricultural assets were more than double those of non-contractors. Differences also occurred between contractors and non-contractors in quality of housing, quality of household sanitation, electricity and water availability; contractors did better in all these living standard categories. For example, 95% of contractors had high quality sanitation with running water and in-house bathroom, toilet and water supply compared to only 44% of non-contractors.

Smallholders in Lombok own on average 0.47 ha of land. While there is no significant difference between the groups in land owned, there is a significant difference in the area of land rented and the type of land owned. Non-contractors rent more land and own (and work) more irrigated land (0.32 ha compared to 0.16 ha). The larger areas of irrigated land owned by non-contractors ensure a higher

land asset value for this group. For all smallholders dryland area is an important component of the farm area. Contractors work on average just the one plot while non-contractors average 1.2 plots. The greater emphasis on irrigated land may limit the non-contractors' ability to become involved in new labour-intensive enterprises such as broiler chickens. Labour assets may be tied to cropping activities because of cultural and social influences.

**Table 12.** Asset ownership of smallholder households, Lombok.

	Total Sample Means	Contractor Means	Non-Contractor Means	Test
Total value of agriculture assets (Rp.'000)	350	542	226	-2.4**
Total value of non-agriculture assets (Rp.m)	6.9	12.5	3.2	-6.6***
Area of land owned (ha)	0.45	0.43	0.47	0.6
Area of land rented (ha)	0.05	0.01	0.08	2.6**
Area of land owned and rented (ha)	0.50	0.44	0.55	1.5
Area of irrigated land worked (ha)	0.26	0.16	0.32	2.8***
Quality of house (ranking; 1 = excellent)	5.4	4.6	5.9	3.1***
Quality of sanitation (% with good facilities)	64	95	44	54.7***
Households borrowing in the last 2 years (%)	44	77	22	-6.6***
Smallholders who have savings (%)	27	45	15	21.8***
Value of livestock (Rp.m)	1.8	0.8	2.5	2.5**
Value of all assets (Rp.m)	60.9	58.7	62.4	0.4

Test of difference between contractors and non-contractors using t-test or Pearson  $\chi^2$  as appropriate.

\*significant at the 90% level, \*\*significant at the 95% level, \*\*\*significant at the 99% level.

Even though contractors have a greater dryland area, they do not own more livestock. The value of livestock owned by contractors is approximately Rp.0.8m compared to Rp.2.5m for non-contractors.

#### GROSS MARGINS (PER HECTARE)

The nature of the contracted commodity ensures that there is no necessity for contractors to have a specific set of land resources. This ensures that the smallholders surveyed undertake a broad range of agricultural activities with

differing levels of physical resources. The major crop is rice, with soybean, corn and peanuts also grown at significant levels. The gross margins (GM) per hectare for these crops are provided in Table 13.

**Table 13.** Crop GMs per hectare per season, contract and non-contract farmers, Lombok.

	Rice		Soybean		Corn		Peanuts	
	Contract farmer (Rp.000)	Non-contract farmer (Rp.000)	Contract farmer (Rp.000)	Non-contract farmer (Rp.000)	Contract farmer (Rp.000)	Non-contract farmer (Rp.000)	Contract farmer (Rp.000)	Non-contract farmer (Rp.000)
Number of growers	31	105	15	47	7	10	2	22
<b>Income</b>	<b>5,043</b>	<b>4,939</b>	<b>8,981</b>	<b>6,430</b>	<b>1,900</b>	<b>2,950</b>	<b>10,000</b>	<b>9,760</b>
<b>Costs</b>								
Variable	1,069	979	1,447	654	436	735	2,850	1,696
Labour	969	659	1,668	737	517	403	268	2,002
Capital	548	214	162	20	0	5	650	766
Barongan	173	265	0	149	148	55	0	0
Bawon	205	130	70	64	43	0	0	0
<b>Total Cost</b>	<b>2,964</b>	<b>2,247</b>	<b>3,347</b>	<b>1,626</b>	<b>1,143</b>	<b>1,199</b>	<b>3,767</b>	<b>4,463</b>
<b>Gross Margin</b>	<b>2,079</b>	<b>2,692</b>	<b>5,634</b>	<b>4,804</b>	<b>757</b>	<b>1,751</b>	<b>6,233</b>	<b>5,297</b>

*Barongan* — contract services costs paid as a set fee.

*Bawon* — contract services costs paid as a percentage of yield.

The low priority of cropping and the smaller areas of irrigated land available to the contractor are evidenced by the fact that only 31 contractors (40%) grow rice compared to 105 non-contractors (88%). Non-contractors are also far more likely to grow soybean and peanuts but there is an equal probability of them growing corn. With regard to the two major crops — rice and soybean — another trend emerges. Contractors have a higher yield, but also use significantly more inputs. The gross margins, therefore, are similar for both contractors and non-contractors. The variable costs (including chemicals, fertiliser, land rental) incurred in growing rice are the same for contractors and non-contractors. The labour and capital costs, however, are higher for the contractor. The implication may be that contractors

have switched labour from cropping to their broiler chicken enterprise, which results in them employing more off-farm labour to help with the rice crop (Table 14). With soybean the differences are more substantial, with total variable costs for contractors (Rp.3.3m) slightly more than double those of non-contractors (Rp.1.6m). Contractors place a higher value on their labour than non-contractors, preferring to work with the broiler chickens or off-farm rather than in the cropping activities.

**Table 14.** Crop costs, Lombok.

	<b>Total Sample Means</b>	<b>Contractor Means</b>	<b>Non-Contractor Means</b>	<b>Test</b>
Chemical costs (Rp.'000/ha)	857	980	821	-1.0
Total labour (hr/ha)	124	120	125	0.3
Total family labour (hr/ha)	38	17	44	2.0*
Total non-family labour (hr/ha)	86	103	81	-1.2
Female family labour (hr/ha)	12	2	15	2.2**
Fem. non-family labour (hr/ha)	50	59	48	-1.2
Male family labour (hr/ha)	25	14	28	1.7*
Male non-family labour (hr/ha)	36	44	34	-1.2
<i>Barongan</i> (Rp.'000/ha)	403	570	354	-1.9*

Test of difference between contractors and non-contractors using t-test or Pearson chi<sup>2</sup> as appropriate.

\*significant at the 90% level, \*\*significant at the 95% level, \*\*\*significant at the 99% level.

Corn is probably used more as a food crop while peanuts are an important cash crop, especially to the non-contractors. Once again labour availability may be the factor that limits a contractor's ability (or desire) to grow peanuts. Contractor labour is used in broiler chicken production, with no excess labour available even for potentially lucrative activities such as growing peanuts.

The broiler contract is a high cost/high return activity requiring considerable daily labour. An average contract is for 40 days (Table 15) from the time that the smallholder receives the day-old chick until it is sold in the market. The labour requirement is about 19 hours per day, of which six hours is provided by male family members and 12 hours by male non-family members. Although the contracting company NUJ provides some credit support for inputs, the contract cycle still requires considerable cost outlays (Rp.32.5m/contract). The company also requires

contractors to have a shed and the necessary equipment and electricity supply before they can enter their first contract. This requires a further Rp.28.9m in overhead costs. The average return per contract is Rp.2.7m. Smallholders at present are averaging about 5.4 contracts per year for an annual GM of Rp.14.3m. The high capital and input costs plus the demand on family labour will limit the ability of the poorer farmers to enter into broiler chicken contracts.

**Table 15.** Broiler chicken basic information and GMs per contract per year.

Number of growers	77
Average number of contracts per year	5.37
Average total number of days broilers kept	40
Average value of capital invested (Rp.)	28,900,000
Total family labour (hr/day)	6.0
Total non-family labour (hr/day)	13.3
<b>Income/Contract</b>	
Sale of chickens (Rp.)	<b>35,190,000</b>
<b>Costs/Contract</b>	
Purchase chickens (Rp.)	5,768,000
Feed, medicine (Rp.)	25,099,000
Electricity (Rp.)	615,000
Other (Rp.)	446,000
Labour (Rp.)	596,000
<b>Total Costs/Contract (Rp.)</b>	<b>32,524,000</b>
<b>Gross Margin/Contract (Rp.)</b>	<b>2,666,000</b>
<b>Gross Margin/Year (Rp.)</b>	<b>14,316,000</b>

#### HOUSEHOLD INCOME

Differences in farming systems are highlighted in Table 16. Non-contractors grow greater areas of rice, soybeans and peanuts, while contractors grow more tree crops. Wealthier farmers with less labour available may be more prepared to invest in longer-term alternatives such as timber, fruit trees and plantation crops than poorer farmers who have more immediate cash-flow concerns.

**Table 16.** Income sources of smallholder households, Lombok.

	Total Sample Means	Contractor Means	Non-Contractor Means	Test
Total labour days spent off-farm	135	153	124	-1.4
Total off-farm income using household labour (Rp.m)	4.8	7.8	2.8	-5.7***
Total off-farm — all sources (Rp.m/hh)	4.9	8.0	2.9	-5.7***
On farm labour use, % of total	58	50	64	2.8***
Rice (ha.)	0.61	0.41	0.75	3.3***
Soybean (ha.)	0.07	0.04	0.08	1.8*
Corn (ha.)	0.05	0.05	0.05	0.2
Peanuts (ha.)	0.2	0.0	0.4	3.0***
Mixed crops (ha.)	0	0	0	-1.2
Tree crops (ha.)	0.06	0.10	0.04	-2.3**
Rice (Rp.m/hh)	1.47	0.91	1.83	2.7***
Soybean (Rp.m/hh)	0.27	0.22	0.30	0.7
Corn (Rp.m/hh)	0.06	0.02	0.08	1.6
Peanuts (Rp.m/hh)	0.12	0.02	0.18	2.2**
Broiler chickens (Rp.m/hh)		14.30		
Total crop (Rp.m/hh)	2.13	1.29	2.68	3.0***
Total tree crop (Rp.m/hh)	0.11	0.16	0.07	-1.6
Total livestock (Rp.m/hh)	0.58	0.40	0.70	0.8
Total farm (Rp.m/hh)	8.5	16.2	3.5	-8.8***

Test of difference between contractors and non-contractors using t-test or Pearson chi<sup>2</sup> as appropriate.

\*significant at the 90% level, \*\*significant at the 95% level, \*\*\*significant at the 99% level.

While non-contractors have significantly higher cropping incomes, this is more than compensated by the returns from broiler chickens. Contract farmers have higher on- and off-farm incomes than non-contractor farmers. While total labour used in cropping is similar, non-contractors use more family (both female and

male) labour than contractors. This is consistent with the assumption that contractors use their labour first with the broiler chickens and off-farm sources and then in on-farm cropping and livestock activities. Contractors also use significantly higher levels of contract labour than non-contractors.

Income sources and labour use also differed between the two groups with non-contractors using nearly two-thirds of household labour on-farm compared to around half for contractors. Contractors received more income from off-farm sources than non-contractors (Rp.7.8m compared to Rp.2.8m) in the form of income from non-agricultural work, remittances and pensions. Thirty-two per cent of surveyed households received no off-farm income in the previous 12 months.

## Results

### FACTORS AFFECTING CONTRACT PARTICIPATION

The type of smallholder who participates in the broiler contract is significantly different to the type of seed rice contractor in Bali. In Lombok participation in the contract was negatively influenced by ownership of irrigated land (Table 17). This indicates that the contract may be more attractive to smaller farmers. Since the broiler enterprise is strongly separable in production from other farm enterprises, any economies to size from land ownership should not influence costs of producing broilers and hence selection for the contract. Higher education levels beyond year three also favoured participation in the contract, as did credit constraints and strong

**Table 17.** Results of probit analysis for Lombok.

Age of household head (years)	-0.004
Household head education only year 3	0.151
Household head education > year 3	0.523**
People in household 14–65 yrs	0.060
Dry land owned and operated (ha)	0.130
Irrigated land owned and operated (ha)	-0.421**
Value of agricultural assets (Rp.000)	0.00005
Value of non-agricultural assets (Rp.000)	0.000
Value of livestock (Rp.000)	-0.00004**
Credit constrained (yes = 0)	-0.201**
Number of loans in previous 12 months	0.430**
Number of groups household participates in	0.067
Number of agricultural groups	-0.349**
Expenditures on chemicals (Rp.000)	0.0004

\*denotes 5% significance level.

\*\*denotes 1% significance level.



borrowing histories. Livestock ownership favoured participation while membership in agricultural groups worked against participation. The contract appears to appeal to less well-capitalised smallholders who were well educated, are currently credit constrained but who have strong borrowing histories.

As the selection of broiler chicken contractors is done on an individual, not a group, basis the company can be more selective in the smallholders to whom they offer contracts. Because of the individual selection process the characteristics of contractors and non-contractors are more distinct than in the seed rice contract. The model was able to correctly select contractors 79% of the time and non-contractors 87% of the time, compared to 59% and 69% respectively in Bali.

#### THE EFFECT OF CONTRACTS ON HOUSEHOLD GROSS MARGINS

There is a significant increase in household gross margins through participating in a broiler contract (Table 18). Likewise, farmers with higher areas of both dryland and irrigated land have higher gross margins. Unlike in the other case study, age and education play no role in increasing household gross margin. Livestock ownership and credit availability are also not important. The importance of contract participation and not other variables indicates that once the infrastructure is in place the support received by the smallholder from NUJ will ensure a profitable activity. Broiler production, while requiring entrepreneurial ability (smallholders can approach the company directly for a contract and must be able to fund the chicken shed), does not require any particular technical or managerial skill to produce the finished product.

**Table 18.** Results for gross margins, Lombok.

Contract participation (zero-one)	13,500**
Age of household head (years)	-63.1
Household head education only year 3	-356.5
Household head education > year 3	-171.1
People in household 14–65 yrs	105
Dry land owned and operated (ha)	3,875**
Irrigated land owned and operated (ha)	7,796**
Value of agricultural assets (Rp.000)	0.25
Value of non-agricultural assets (Rp.000)	0.067
Value of livestock (Rp.000)	0.063
Credit constrained (yes = 0)	1,428.7
Number of loans in previous 12 months	-1,153.7
Constant	1,223.8
R <sup>2</sup>	0.352

\*denotes 5% significance level.

\*\*denotes 1% significance level.

## THE EFFECT OF CONTRACTS ON LABOUR USE

Contract participation in Lombok appeared to have no direct effects on use of family labour or off-farm work by family members, possibly reflecting strong technical separability between broiler production and other farm activities (Table 19). Use of on-farm family labour was negatively related to ownership of non-agricultural assets and previous borrowing with both factors positively influencing off-farm work by household members. Demand for non-family labour was driven by ownership of dry and irrigated land, reflecting that dryland production is more prominent in Lombok than in Bali, where it is of little importance. Value of livestock owned, literacy of the household head and whether the household was credit constrained also contributed to employment of off-farm work. Use of female labour decreased with education of the household head and

**Table 19.** Factors affecting on-farm demand for family labour, non-family labour, female labour and off-farm work in the Lombok sample.

	Family labour use	Non-family labour use	Female labour use	Off-farm work
Contract participation (zero-one)	-15.17	-80.15	-5.988	-17.14
Age of household head (years)	0.4706	-0.4980	-0.1424	0.2224
Household head education only year 3	-14.95	-8.955	-21.06*	49.71*
Household head education > year 3	-7.560	58.49*	0.5995	87.18**
People in household 14–65 yrs	3.887	1.642	3.193	14.69*
Dry land owned and operated (ha)	8.193	66.25**	30.84**	-60.14**
Irrigated land owned and operated (ha)	19.78	98.47**	84.16**	-34.27
Value of agricultural assets (Rp.000)	-0.00003	0.0041	0.0066**	0.0213
Value of non-agricultural assets (Rp.000)	-0.0011**	0.0014	-0.0005**	0.0003
Value of livestock (Rp.000)	0.011**	-0.001	0.0032*	0.0041
Credit constrained (yes = 0)	-13.65	-20.59**	-1.074	40.17*
Number of loans in previous 12 months	-22.17**	30.42	-10.15**	10.05
Constant	69.63	54.05**	20.93	22.15
R <sup>2</sup>	0.3181	0.0637	0.4848	0.1662

\*denotes 5% significance level.

\*\*denotes 1% significance level.

increased with land ownership, value of agricultural assets and livestock and previous borrowings. Off-farm work was positively related to the education of the head of household, the number of adults in the household and negatively related to land ownership. That is, better-educated smallholders with smallholdings and large families were more likely to be found working off the farm.

## *Conclusions*

The contract between NUJ and smallholders has been highly successful as measured by the fact that few contractors have chosen to withdraw from the contract and there are significant financial benefits from participating. In a relatively short time NUJ has developed a strong system of support for contractors that includes management advice and credit (to purchase inputs). The system has been so successful that the need for NUJ to provide an incentive for growers to sign their first contract has diminished and individual smallholders are now approaching the company and requesting a contract.

The smallholders who seek broiler contracts tend to own less irrigated land than non-contractors, be less constrained by credit, more educated and are more likely to be members of farmer groups. These growers are certainly not poorer; they just have less access to productive land assets. The introduction of an activity that does not require land but does require capital and a certain amount of risk suits this style of smallholder. Farmers who are fully employed on larger farms do not see the need or do not have the available labour or capital to introduce this type of enterprise.

These are poor smallholders compared to those participating in the Bali seed rice contract. The benefits they derive from contract participation are considerable and fall neatly into three of the categories of benefits associated with contracts outlined previously. Feed costs are high and smallholders receive advances for both feed and other inputs that are deducted from the settlement price, probably allowing smallholders to overcome credit constraints. The contract is a major form of diversification for smallholders as production risk is low and price risk is borne by the firm. The firm's representative stated that the firm is concerned about continuity of supply and when prices fall on a seasonal basis (related to fish catch) the firm takes losses on production rather than lose contractors. The firm provides guidelines for production, which is chemical intensive, and there seems little chance contractors would easily acquire this type of expertise without participating in a contract. A possible negative associated with the contract is the possibility of 'capture' within the contract. Smallholders make large investments to get into the contract and these would not be written off easily if contract terms were to sour. However, we found no evidence of deteriorating contract terms.

# 4

## Conclusions



## Summary of results

Both contracts were successful from the perspective of the agribusiness firms involved inasmuch as the contracts had each been operating for at least five years and none of them showed any sign of joining the long list of ‘failed’ farm contracts in the developing world. In general, costs of negotiating contracts — maladaptation costs, running costs and maintaining relationships with smallholders — turned out to be low enough to allow satisfactory margins for the agribusiness firms involved. The types of benefits experienced by smallholders were consistent with theory and each contract contributed positively to welfare of smallholders participating in them. The Lombok contract resulted in access to a production system that was technically demanding and where economies to size in processing and marketing would usually prevent smallholder access. Both contracts provided some access to credit or inputs and reduced smallholder risk by providing assurances the firm would purchase outputs. From the statistical analysis, the contracts in Lombok resulted in improved returns to capital and left participants better off. The Bali contract did not increase returns to capital but did confer other benefits. From a development perspective, the contracts reduced absolute poverty. However, given the agribusiness firms in Bali favoured larger, and in Lombok favoured wealthier, smallholders, the contracts probably increased relative poverty.

A conspicuous aspect of the success of the seed rice contract was the role played by grower groups in operation of the contracts. PT Pertani receives tangible benefits from dealing with groups rather than individuals. The costs of drafting, negotiating and enforcing contracts are lower if the firm negotiates with five or six *pekaseh* rather than 200–300 growers. Grower differences within the groups can be resolved internally using traditional dispute resolution systems and written contracts need only be struck with the heads of grower groups. In terms of enforcement costs, the firms benefit by selecting contract participants at group level rather than individual level since, providing the contract serves collective interests, the group has incentives to deal with contractually errant members. Enforcement costs, an important source of contract failure elsewhere, were dealt with by the group using its existing power structure. Maladaptation costs when contract specifications are not met are also an important source of contract failure. PT Pertani is in the enviable position of being able to sell sub-standard seed to the consumption market, which means it can offset some of the costs incurred when quality is below standard. However, again, the grower group plays a role in preventing maladaptation to the contract. Members have a collective interest in preventing any individual from departing from contract growing guidelines since this would jeopardise the contract for the whole group and not just for the errant member. Set-up and running costs associated with governance are also greatly reduced in a group environment since the firm field employee works at grower group level. His costs of conflict resolution are reduced by the collective nature of grower interests and regular meetings of the group allow him to spend less

time face-to-face with individuals. Finally, financial transactions are supervised by the *pekaseh* at group level including grower payments and, in some cases, the provision of inputs. We concluded that PT Pertani achieved transacting scale by contracting with smallholder groups that are like small firms with powerful chief executive officers rather than with many individual smallholders and that this accounts, at least partly, for the success of these contracts.

The power relationships between *pekaseh* and others associated with the contract were never clear. The *pekaseh* was the link between growers and the contracting firm and derived considerable authority as the sole signatory of the contract and from the financial arrangements. In the case of PT Pertani, final payments to growers were made through the *pekaseh*. It was not clear how much transparency there was in these arrangements. However, as some smallholders did not actually know to whom they were contracting, or that they were, in fact, contract smallholders, indicates that information about the contract within the grower group was limited. Further research is needed to fathom the true role played by the *pekaseh* in these situations, but, on the surface at least, it seems to be some type of principal-agency issue. The *pekaseh* presumably services his own interests by trading off the respective interests of contract growers, non-contract growers who are also group members, the contracting firm and other community and government interests.

Researchers themselves face a selection issue when choosing contracts to examine. Except for Glover and Kusterer (1990) all the case-studies we reviewed focused on 'successful' contracts where success meant continuance of the contract over a number of years. In fact, in identifying contracts in the field for this study we heard many stories about unsuccessful contracts that lasted for only a few seasons before being abandoned. The extent smallholders bore costs associated with these failures was not clear. Finally, this study focused only on effects of contract farming at farm level and little consideration was given to upstream and downstream effects except for the effects of contracting on use of non-family labour. Evaluation of upstream and downstream effects of contract farming is an obvious candidate for further research.

In summary, participation was driven in the cropping contract by ownership of irrigated land and participation in more agricultural groups. There was little evidence that transaction costs played a significant role in encouraging smallholders to participate in the contract except in Lombok, where smallholders who had difficulty getting credit were more likely to participate. The results support a general conclusion that smallholders in Bali were likely to be selected by the firm for the contract rather than by a process of self-selection. That is, the selection process favoured larger, lower unit cost smallholders. In Lombok the opposite occurred with smallholders with smallholdings being more likely to participate. The Lombok firm reported that smallholders approached them for contracts, indicating some self-selection, and this possibly explains the importance of credit constraints in the Lombok participation equation.

## Policy implications

The study has shown that there are a range of contractual types that can be mutually beneficial to both smallholders and agribusiness in Indonesia. The commodity to be produced, the infrastructure and institutions available, and the capability of the smallholders influence the characteristics of a partnership arrangement. When developing contracts the following considerations need to be included:

- Develop appropriate contractor groups (e.g. groups for seed rice, spatially diverse individuals for broiler chickens).
- Provide credit, inputs and technical and management advice in order to maximise productivity.
- Ensure smallholders repay loans to guarantee accountability and sustainability.
- Spread risk (price and yield) between smallholders and firms.
- Develop and implement quick and transparent payment systems.
- Allow contractors and contractees to come and go from the contract and allow the contract to evolve over time as capability, institutions and infrastructure develop.

Given the benefits of contracting in terms of greater returns to capital and increased demand for labour, policy makers in Indonesia should view these contractual relationships in a positive light and seek mechanisms to expand these types of interaction between multi-national corporations and smallholders. However, certain actions could be taken to expand the benefits of contracting and improve the ability of farmer groups to work with multi-nationals.

- The fact that households with greater irrigated land tend to be selected into contracts suggests, on equity grounds, a need to seek mechanisms to improve the attractiveness of households with less irrigated land. This may be done by working with these farmers, possibly in conjunction with the multi-national corporations, to improve their management capabilities.
- Given the importance of the farmers' groups in working with multi-national corporations, the government may try to assist farmers in their ability to organise and negotiate with multi-nationals. With improved organisation, farmers can increase the likelihood of working with multi-nationals and improve the chances of developing a mutually beneficial relationship. Poor farmers are more likely to be included in a contract if they are part of a group. Group selection, while influenced by the characteristics of the group members, may also be influenced by the characteristics of the group head. Therefore, to maximise the potential for poorer smallholders to be included, the government could continue to improve linkages between group leaders and agribusiness.
- The Indonesian Government could continue to adjust the regulatory regime to reduce transaction costs for participants in contracts. Regulatory adjustments to create a desirable policy environment for contracting include reducing paper

work for exporters, reducing certain import and export taxes, removing import restrictions, implementing food-safety standards, replacing crop production taxes with land taxes and deregulating prices in food markets. Removal of specific regulations can also directly facilitate contracting.

- The Indonesian Government should continue to play an enabling role to encourage contract farming. The enabling role of government in contract farming may work at two levels: macro and micro. Macro changes would improve the commercial environment in which contracting occurs and would be directed at reducing costs of contracting for all parties. Such reforms would be broad in scope, such as improving banking regulation, farm credit arrangements, foreign direct investment regulations, competition policy, export policy and taxation policy for multi-national corporations and export firms. Micro reforms to facilitate contract farming are training, arbitrating disputes, undertaking research and providing extension services relevant to expansion of contracting. Training programs for smallholders in literacy, accounting and cash management may reduce miscommunication in contracts. Research on agricultural production and food processing already undertaken by the Indonesian Government may benefit from a sharing of information about research priorities and issues with agribusiness firms. With extension, the tendency is for agribusiness firms to undertake their own or out-source it to ensure quality standards are met and contracts stay on track. However, if government extension officers were involved in this activity such outreach could target more smallholders including those not of immediate interest to commercial agribusiness firms because of their small land holdings or poor education.



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