

Produktivitas usahatani dalam sistem pertanian terpadu: studi kasus di kecamatan Amarasi, kabupaten Kupang, Nusa Tenggara Timur

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Abstrak

Banyak petani di Amarasi yang menggabungkan peternakan dan pertanian dalam usaha tani pada skala kecil. Kebanyakan pada usaha tani tersebut, produktivitas baik sistem produksi pertanian maupun peternakan sangat rendah. Namun demikian ada potensi peningkatan terhadap produktivitas peternakan. Produksi pertanian dapat dikembangkan dengan meningkatkan praktek pertanian dengan penggunaan teknologi yang tersedia serta pemberian akses terhadap fasilitas pinjaman, informasi agricultural dan peningkatan peran institusi desa. Sementara penggabungan pengembangbiakan dan penggemukan menunjukkan adanya alternative untuk peningkatan sistem produksi ternak.

Integrated farming systems productivity: a case study in Amarasi, Kupang district, East Nusa Tenggara

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Abstract

Many farmers in Amarasi operate small-scale mixed crop–livestock farms. In most of these farms, productivity of both food crops and livestock production systems is quite low. There is, however, potential to improve the productivity of the farms. Food crop production can be enhanced by improving farm practice using available technology and access to credit facilities, agricultural information and the increasing roles of village institutions. Combining breeding and fattening represents an alternative for improving livestock production systems.

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Pendahuluan

Amarasi merupakan salah satu dari 22 kecamatan di Kabupaten Kupang Nusa Tenggara Timur (NTT) yang terdiri dari 7 buah desa dan tiga di antaranya yakni desa Oesena, Ponain dan Tesbatan merupakan lokasi studi kasus. Luas wilayah Kecamatan Amarasi saat ini adalah 154,9 km² dengan kepadatan penduduk 91 orang per km². Kondisi iklim di daerah ini, seperti yang dipublikasikan oleh beberapa penulis, adalah kering yang dipengaruhi oleh angin muson tenggara yang bertiup dari Australia dimana musim kemaraunya cukup panjang (8–9 bulan) (Nulik et al. 1999; Kapa 1999; Piggin 2003) dengan curah hujan tahunan pada tahun 2004 berkisar antara 12,7 mm (bulan Mei) sampai 463,8 mm (bulan Februari). Suhu dan kelembaban tertinggi terjadi pada bulan Desember masing-masing 33,5°C dan 92 persen. Evaporasi rate berkisar antara 4 sampai 9 mm per hari dan dalam setahun dapat mencapai total 2000 mm (BPS Kabupaten Kupang 2004).

Kadaan di atas ditambah kondisi topografi daerah yang bergelombang sampai berbukit serta tanah yang bersifat calcareous dengan pH berkisar antara 8–9 menyebabkan sulit bagi tanaman untuk bertumbuh dengan baik. Oleh karena itu yang perlu mendapat perhatian dalam pengembangan pertanian di daerah Amarasi adalah aspek konservasi tanah maupun air. Hal ini perlu dalam rangka mengantisipasi musim hujan yang singkat berakibat pada kurangnya ketersediaan air. Pada kondisi seperti ini petani peternak mengalami kesulitan dalam usahatani maupun usaha ternak. Hal ini berdampak lanjut pada rendahnya produktivitas pertanian dan peternakan di daerah ini.

Dengan demikian diperlukan pengenalan terhadap sistem usahatani yang telah ada di Amarasi untuk diperbaiki dalam kerangka *Integrated Rural Development*. Untuk tujuan tersebut makalah ini membahas kajian dari beberapa hasil studi kasus yang dilakukan di Kecamatan Amarasi Kabupaten Kupang terkait produktivitas usahatani dan ternak dalam sistem usahatani terpadu di Amarasi.

Potensi Sumberdaya

Kecamatan Amarasi sebagaimana dijelaskan di depan memiliki wilayah sekitar 2,6 persen dari luas Kabupaten Kupang. Jumlah penduduk Kecamatan Amarasi pada Tahun 2004 adalah 14.113 orang yang

terdiri dari 7.273 laki-laki dan 6.840 perempuan tergabung dalam 3.371 rumah tangga serta tidak kurang dari 75 persen penduduknya bekerja di sektor pertanian dengan pendapatan perkapita yang relatif rendah yakni Rp974.000 (BPS Kabupaten Kupang 2004).

Tabel 1 di atas memperlihatkan bahwa lahan kering menjadi tumpuan kegiatan pertanian di Kecamatan Amarasi. Sedangkan di sektor peternakan didominasi oleh ternak sapi dan unggas. Luas lahan sawah 300 ha merupakan sawah tadah hujan berpenyairan sederhana.

Pola Usahatani di Amarasi

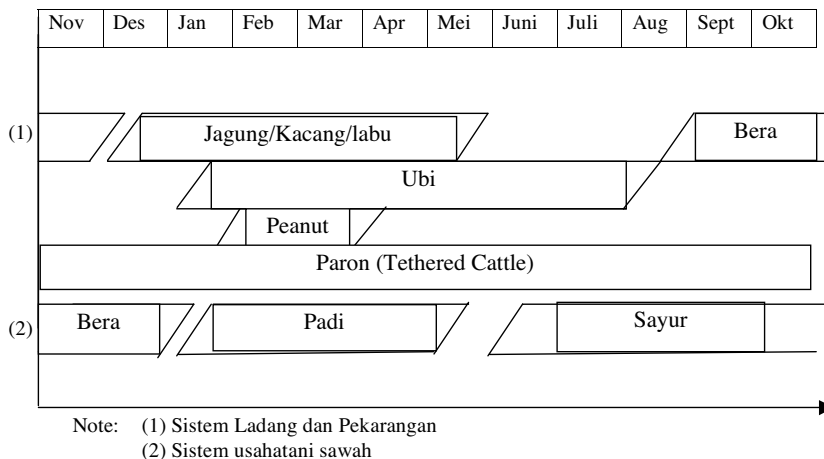
Pengelolaan usahatani di Amarasi menurut hasil penelitian selama tahun 1994–2004 di tiga desa (Oesena, Ponain, dan Tesbatan) dilaksanakan pada empat jenis lahan yakni:

Usahatani lahan kering (usahatani ladang)

Sistem ladang di Amarasi dicirikan oleh sistem tebas-bakar (*slash-and-burn systems*). Komoditas yang ditanam pada usahatani ladang adalah jagung sebagai tanaman utama, kacang gude (*Cajanus cajan*), labu dan ubi kayu. Jagung, kacang dan labu ditanam pada satu lubang pada bulan Desember dan dipanen pada bulan April atau Mei. Sedangkan ubi kayu ditanam diantara tanaman utama pada waktu yang sama dan dipanen pada bulan Agustus sampai Oktober. Rata-rata produksi jagung pada tahun 2004 adalah 1,21 ton ha⁻¹, kacang 0,34 ton ha⁻¹, ubi kayu 2,560 umbi per ha, serta 35 karung plastik kacang tanah per ha. Gambar 1 memperlihatkan pola tanam petani di lahan kering dan sawah di Amarasi.

Usahatani pekarangan

Sebagaimana halnya di ladang tanaman jagung juga menjadi tanaman utama di lahan pekarangan yang ditumpangsarikan dengan kacang dan ubi kayu (Kapa 2004). Beberapa tanaman tahunan dalam jumlah kecil seperti kelapa, nangka dan tanaman makanan ternak misalnya lamtoro, gamal dan galaga juga ditanam di pekarangan. Jagung yang ditanam biasanya varietas umur pendek dengan maksud untuk menyediakan sumber makanan bagi keluarga. Produksi jagung dari lahan pekarangan sangat sulit untuk diketahui namun menurut estimasi para petani sekitar 760 kg/ha.



Gambar 1. Pola Tanam oleh Petani di Amarasi (study areas), Kupang. (1) = Sistem Ladang dan Pekarangan; (2) = Sistem usahatani sawah.

Usahatani Sawah

Hasil penelitian Kapa (2004) menyatakan tidak semua petani di Amarasi memiliki lahan sawah, dari 50 responden yang diwawancarai hanya 20 % petani yang mengusahakan sawah. Rata-rata luas lahan sawah per kepala keluarga (per farm) hanya 0,32 ha. Pada lahan ini diusahakan tanaman padi (*monocrop*) dengan pola umum padi–bera, namun di desa Tesbatan dengan memanfaatkan musim hujan dan ketersediaan mata air polanya adalah padi–sayur–bera. Waktu tanam umumnya dimulai pada akhir bulan Desember sampai Januari dan dipanen sekitar bulan Maret/April. Pada pola pertama setelah padi dipanen maka lahan dibera sampai musim tanam berikutnya. Sedang pada pola tanam kedua, setelah padi dipanen lahan dibiarkan beberapa saat (1–2 minggu) kemudian diolah untuk menanam sayur. Rata-rata produksi padi 1,7 ton ha⁻¹. Sedangkan dari usahatani sayur karena sulit untuk mendapatkan produksi fisik sehingga dinilai dengan rupiah. Hasil studi menunjukkan rata-rata pendapatan petenai sebesar Rp 2.250.000 per tahun.

Usahatani mamar

Mamar (tradisional agroforestry) adalah lahan yang biasanya terletak dekat mata air atau sungai. Tetapi mamar kering tidak harus dekat dengan mata air. Rata-rata luas lahan mamar 0,47 ha. Mamar identik dengan tanaman kelapa, pinang, sirih, pisang, nagka dan beberapa tanaman hijau makanan ternak seperti lamoro, gala-gala dsbnya. Pemilikan mamar biasanya

diturunkan dari generasi ke generasi dan luasnya makin lama makin sempit. Pada tahun 1994, rata-rata luas lahan mamar di Amarasi 0.6 ha dan pada tahun 2004 menjadi 0,47 ha. Hal ini terjadi karena ada fragmentasi lahan dan pertambahan jumlah penduduk. Selain kelapa, hasil dari tanaman lainnya sulit diukur dalam bentuk fisik tetapi petani menyatakan bahwa mamar mempunyai peranan penting dalam menyediakan uang tunai untuk menutupi kebutuhan sehari-hari. Pada tahun 2004 penghasil rata-rata dari mamar yang diperoleh dari penjualan kelapa dan produk lainnya adalah sebesar Rp. 672.000.

Usaha Ternak di Amaras

Usaha ternak merupakan bagian integral dari sistem usahatani di Amarasi. Ternak yang banyak dipelihara adalah sapi, dan unggas sedangkan ternak lainnya dipelihara dalam jumlah kecil. Sebagian besar dari usahaternak sapi dipelihara dengan cara ekstensif tradisional dimana intervensi pemilik terhadap usaha ternak sangat minim. Pada sistem pemeliharaan ini biasanya pada siang hari sapi dibiarkan merumput di padang penggembalaan umum, atau di kebun milik peternak dan pada malam hari dikandangkan. Namun dengan meningkatnya derajat komersialisasi ternak sapi mendorong peternak untuk melakukan sistem pemeliharaan yang lebih produktif. Sistem ini dikenal dengan sistem paron atau sistem Amarasi yang berbasis lamtoro.

Sejak diperkenalkan pada tahun 1971, sistem paron menarik minat peternak untuk memeliharanya sapi paron dan bersandar sepenuhnya pada lamtoro sebagai sumber utama pakan. Dengan pemberian lamtoro sebanyak 15–20 kg daun segar perhari dapat menaikkan berat badan 0,5–1 kg per hari. Dengan demikian untuk mencapai berat pasar sekitar 350 kg dari berat badan awal 150 kg membutuhkan waktu hanya 3–6 bulan dan dapat memberikan kontribusi 30–70 % terhadap pendapatan petani.

Adanya serangan kutu loncat pada lamtoro di awal tahun 1986 telah menghancurkan tegakan lamtoro yang berdampak langsung pada penurunan produktivitas usahatani dan ternak di Amarasi seperti yang dilaporkan Mudita dan Kapa (1987) dan Widiyatmika et al. (1989). Misalnya produksi tanaman jagung turun sebesar 53 persen, sedang bagi sapi paron kekurangan lamtoro menyebabkan masa pemeliharaan menjadi lebih lama dan jumlah sapi paron juga berkurang dari rata-rata 7 ekor sebelum tahun 1987 menjadi rata-rata 3 ekor per tahun. Tidak jarang petani harus berjalan sejauh 1–3 km perhari guna mendapatkan HMT. Guna mengatasi hal ini peternak juga mencari sumber HMT alternatif seperti galaga, kapok, limbah pertanian disamping lamtoro.

Tenaga Kerja

Penggunaan tenaga kerja dalam pelaksanaan usahatani masih didominasi oleh tenaga kerja manusia yang bersumber dari dalam keluarga dan dari luar keluarga berupa tenaga gotong royong sedang sistem upahan jarang dilakukan. Kapa (2001) melaporkan kurang lebih 11.000 jam per keluarga yang digunakan setiap tahun untuk melakukan aktivitas usahatani. Dari jumlah tersebut 48 persen digunakan untuk tanaman pangan, 37,5 persen untuk usaha ternak dan sisanya untuk kegiatan off farm. Intensitas penggunaan tenaga kerja berhubung erat dengan musim. Penggunaan tenaga kerja yang paling intensif terjadi menjelang dan pada musim hujan (Oktober dan April). Penggunaan pada bulan Oktober adalah untuk persiapan lahan sedang pada bulan April untuk kegiatan panen dan pasca panen. Pada bulan lain intensitasnya berkurang, bahkan pada bulan-bulan tertentu intensitasnya sangat rendah. Untuk itu perlu dipikirkan pembukaan lapangan kerja guna memanfaatkan tenaga kerja yang ada.

Kendala Usahatani

Produktivitas hasil beberapa komoditas tanaman pangan yang dicapai oleh petani dari tiga desa kasus di Amarasi (Oesena, Ponain, dan Tesbatan) umumnya masih rendah bila dibandingkan dengan hasil produksi potensial yang bisa dicapai. Hal ini terjadi karena kendala teknis maupun kendala sosial ekonomi. Keterbatasan air, penyediaan varietas, pemupukan, dan pengendalian hama dan penyakit masih merupakan kendala utama di desa-desa kasus. Dari segi penyediaan tenaga kerja, tenaga kerja utama adalah tenaga kerja manusia namun dari segi pemanfaatannya masih kurang produktif. Tenaga kerja ternak walaupun tersedia namun pemanfaatannya masih sangat terbatas, lahan usahatani yang dimiliki sempit dan kurang subur juga merupakan kendala utama. Kendala sosial ekonomi ditandai dengan motivasi yang sedang disertai kurangnya keterampilan. Walaupun tersedia sarana penunjang kelembagaan namun peranannya kurang aktif dan tidak lancar, terbatasnya kredit modal kerja, serta tidak tersedianya teknologi di tingkat desa menjadi kendala pengembangan usahatani.

Kendala Usaha Ternak

Musim hujan yang singkat disertai dengan belum pulihnya tanaman primadona lamtoro menyebabkan minimnya suplai pakan baik jumlah maupun mutu bagi ternak NTT. Hal ini berdampak pada rendahnya produktivitas ternak sapi seperti yang dijelaskan di atas.

Tumbuhan yang relatif lebih tahan terhadap kekeringan dibandingkan dengan jenis-jenis sumber hijauan lain seperti lamtoro kini tidak lagi menjadi pemasok utama hijauan bagi ternak yang bergizi tinggi dan palatable dan juga sebagai tumbuhan penyubur tanah sekaligus pencegah erosi tidak dapat lagi diandalkan sepenuhnya karena adanya invasi kutu loncat. Kejadian ini telah mengganggu produktivitas pertanian di daerah ini. Masalah menurunnya produktivitas ternak dipengaruhi oleh beragam faktor yakni (1) faktor lingkungan seperti kurangnya ketersediaan pakan yang berkualitas serta keberagaman HMT alternatif yang rendah, penyakit, (2) faktor biologi misalnya tingkat kematian anak (calf mortality) cukup tinggi bahkan pada kondisi tertentu bisa mencapai 30 persen, (3) faktor manajemen berhubungan dengan sistem pemeliharaan. Dimana sebagian besar peternak masih menggunakan sistem ekstensif seh-

ingga kontrol terhadap breeding, feeding dan penyakit sangat rendah, dan (4) Sosial ekonomi berhubungan dengan kurangnya modal, kurangnya akses terhadap fasilitas kredit dan pasar, serta diperburuk oleh krisis ekonomi yang terjadi saat ini.

Kesimpulan dan Harapan Ke depan

Persoalan pokok yang dihadapi saat ini rendahnya produktivitas tanaman dan ternak di daerah Amarasi yang disebabkan oleh adanya beberapa kendali baik itu teknis, biologi, manajemen maupun sosioal ekonomi. Namun demikian ada potensi yang dapat dikembangkan untuk meningkatkan produktivitas usahatani di Amarasi.

Setelah melihat potensi dan kendala-kendala usahatani/ternak di atas maka ke depan perlu dipikirkan hal-hal sebagai berikut:

1. Adanya kolaborasi baru antara pihak Indonesia (baca: NTT) dengan badan atau lembaga-lembaga dana Australia atau Internasional lainnya dalam konteks pembangunan pedesaan terpadu serta mempererat kolaborasi yang sudah ada baik dalam bentuk bantuan dana, ekpertis, maupun penelitian dengan penekanan pada upaya mendukung pembangunan pertanian dalam rangka menciptakan usaha pertanian yang efisien, berorientasi pasar, agribisnis dan agroindustri di daerah pedesaan.
2. Bidang lain yang perlu mendapat perhatian untuk diteliti adalah adanya kerjasama untuk mengkaji upaya konservasi tanah dan air termasuk teknologi penampungan air, bioteknologi, teknologi pasca panen dan penanganan hama penyakit tanaman secara terpadu.
3. Di bidang tanaman pangan adalah adanya peningkatan hasil usahatani melalui penyediaan benih yang berproduksi tinggi, umur pemdek, tahan kekeringan dan hama/penyakit.

4. Di bidang peternakan perhatian diarahkan pada kerjasama dalam pengkajian feeding strategy untuk mengatasi masalah kekurangan pakan pada musim kemarau, pendirian breeding stock untuk ternak sapi dalam rangka perbaikan mutu genetik sapi bali termasuk di dalamnya penggunaan indigenous genetik stocks serta aspek kesehatan ternak.

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Agroforestry for livelihood enhancement and enterprise development

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Abstract

Agroforestry is a dynamic, ecologically based, natural resources management system that, through the integration of trees on farms and in the agricultural landscape, diversifies and sustains production for increased social, economic and environmental benefits for land users at all levels. By nurturing trees on their farms, pastures and homesteads farmers have been managing agroforestry systems for millennia. Most smallholder farmer agroforestry systems are diverse, multi-species and integrate trees with annual crops and/or animals. Traditionally, these systems are extensive in nature, with small quantities of many products produced for household consumption. Tree management tends to be non-intensive and largely limited to product harvesting. The advent of market economies and improved rural infrastructure has expanded commercial opportunities to many farm communities. However, traditional tree management often leaves communities ill-equipped to produce reliable quantities of high-quality products that meet market specifications. In addition, a lack of security of land tenure has, in many places, led to a corresponding lack of incentives for farmers to invest in long-term land management improvements. Experience also indicates that farmers lack access to professional technical assistance and have limited linkages to market channels and information. As a result, most farmers do not manage their trees because they are not sure where to focus and what can be sold. A system of technical assistance and innovation is needed to empower farmers to seize market opportunities by enhancing and diversifying the productivity and profitability of their agroforestry systems. This paper presents an integrated approach that emphasises market studies that appraise existing and future demand for products that are, or can be, produced by farmers; recommends farmer group extension to help farmers address market opportunities; and encourages farmer group evolution towards farmer enterprise development when appropriate. Examples of the impacts achieved through implementation of this approach and its components are provided.

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Wanatani sebagai matapencaharian tambahan dan pengembangan usaha

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Abstrak

Wanatani adalah sistem pengelolaan sumber alam berdasarkan ekologi yang dinamik melalui penggabungan pepohonan pada lahan perkebunan dan pertanian, keanekaragaman produksi berkelanjutan untuk menambah keuntungan dalam penggunaan lahan di segala tingkat social, ekonomi dan lingkungan. Petani telah melakukan pengelolaan sistem wanatani dengan memelihara pepohonan di kebun, lahan pengembalaan dan halaman rumah selama ribuan tahun. Petani usaha kecil kebanyakan menggunakan sitem wanatani beragam, multi-species, dan menggabungkan pepohonan dan/atau ternak yang dapat di ambil hasilnya tiap tahun. Secara tradisional, sistem ini meluas secara alami. Dalam jumlah kecil banyak hasil yang dihasilkan untuk konsumsi rumah tangga. Pengelolaan pepohonan cenderung untuk produk yang dapat dipanen dalam keterbatasan peningkatan dan perluasan. Terciptanya ekonomi-pasar dan membaiknya sarana di pelosok telah memperluas kesempatan komersial bagi banyak petani. Akan tetapi, pengelolaan pepohonan secara tradisional sering meninggalkan masyarakat tak berbekal untuk dapat menghasilkan produk dalam jumlah yang memadai dan dengan kualitas tinggi yang memenuhi spesifikasi pasar. Selanjutnya, keamanan dalam kepemilikan lahan, di banyak tempat, berakibat pada semangat bagi petani dalam melakukan peningkatan pengelolaan lahan jangka panjang. Pengalaman menunjukkan bahwa petani tidak mendapatkan bantuan teknis profesional dan keterbatasan hubungan dengan jaringan pasar dan informasi. Sebagai hasilnya, kebanyakan petani tidak memelihara pohon mereka karena ketidakyakinannya pada fokus kerja serta apa yang dapat di jual. Sistem bantuan teknis dan inovasi perlu memberikan kuasa pada petani untuk diberi kesempatan menguasai pasar dengan menambah dan meragamkan produk/keuntungan untuk sistem wanatani mereka. Presentasi ini merupakan penggabungan pendekatan yang ber emphasis pada study pasar serta analisa yang dapat menyebar luaskan permintaan akan barang yang ada dan yang akan datang yang dapat di produksi oleh petani, kelompok tani yang menunjuk pada bantuan dalam menangani masalah kesempatan pasar, dan evolusi kelompok tani menuju pengembangan usaha tani apabila mungkin. Contoh dampak yang dihasilkan melalui implementasi pendekatan ini dan komponennya disediakan.

Introduction

Agroforestry is a dynamic, ecologically based, natural resources management system that, through the integration of trees on farms and in the agricultural landscape, diversifies and sustains production for

increased social, economic and environmental benefits for land users at all levels (ICRAF 2006). Agroforestry systems may be defined as land-use systems in which woody perennials (trees, shrubs, palms, bamboos) are deliberately used on the same land management unit as agricultural crops (woody or annual) and/or animals in some form of spatial arrangement or temporal sequence (Huxley and van Houten 1997). For millennia, farmers developed and managed agroforestry systems by nurturing trees on their farm,

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pasture lands and homesteads. Traditionally, these systems produced a wide variety of products—timber, fuelwood, fruits, vegetables, spices, resins, medicines, etc.—primarily to meet household needs but also to generate some income through sales in local markets. Declines in the area of forests, the advent of market economies, and improvement of rural infrastructure have opened commercial opportunities for farm communities to expand or intensify their agroforestry systems. This type of process has been documented in Bangladesh (Byron 1984), Sri Lanka (Gunasena 1999), North Mindanao, the Philippines and the highlands of Kenya (Place et al. 2002). In Indonesia the following commodity-oriented agroforestry systems have evolved: *repong damar* system (Krui, Lampung), jungle rubber system (Jambi and South Sumatra), *tembawang* fruit and timber system (West Kalimantan), *pelak* cinnamon system (Kerinci, Jambi), durian fruit garden (Gunung Palung, West Kalimantan) and *parak* fruit system (Maninjau, West Sumatra) (de Foresta et al. 2000).

Market opportunity and willingness to establish agroforestry systems does not always translate directly to technical capacity and success. Although market-oriented agroforestry systems have developed in many areas, there are a greater number of areas where such systems have not yet developed. Our experience indicates there are a number of factors that might stifle the development of smallholder agroforestry. In many areas smallholder farmers have little experience with intensive tree planting; and little access to technical information and germplasm (seed or seedlings). In Central America, the Caribbean and Kenya, Scherr (1995, 1999) identified the following conditions that favour the development of successful smallholder agroforestry systems: available planting material of species that are appropriate for the site and agroforestry system, experience with tree planting and management, and accessible markets. Potter and Lee (1998) found that the ability of smallholders to plant trees or expand traditional tree-based systems is limited by resource scarcity, absence of technical capacity and experience, and market and policy disincentives. In Lampung, Indonesia, a team of socioeconomic, forestry, horticulture and livestock specialists determined that smallholder agroforestry systems and the productivity of those systems are limited by a lack of technical information, resources and consultation (Gintings et al. 1996). Across South-East Asia, smallholders' tree planting activities are often

restricted by limited access to quality planting material, poor nursery skills and a dearth of appropriate technical information (Daniel et al. 1999; Gunasena and Roshetko 2000).

Quality germplasm of appropriate species is an important innovation and intervention, particularly for smallholders farming marginal lands, who have low capacity to absorb high risk and few resource options (Cromwell et al. 1993; Simons et al. 1994). In South-East Asia quality tree seed is most often controlled by the formal seed sector (research organisations, government agencies and forest industry), to which smallholders have little access (Harwood et al. 1999). Efforts must be made to link smallholders with these sources of quality germplasm and expand smallholder access to a wider range of species that are suited to the biophysical and socioeconomic conditions they confront. This should include developing farmers' tree propagation and tree nursery management skills. Training and participatory nursery development are proven methods of building farmers' awareness, leadership, technical skills and independence regarding germplasm quality, production and management capacity (Koffa and Garrity 2001; Carandang et al. 2006).

Most smallholder agroforestry systems are characterised by limited proactive management and planning. Spacing is irregular and species components often primarily the result of chance (Manurung et al. 2005; Michon 2005). Harvesting products is often the most common management activity, with minimal weeding to control herbaceous and woody competition. As a result, the quality and quantity of products may be far below the system's potential. The productivity of most smallholder agroforestry systems can be improved by enhancing smallholder management skills. Key skills include: species selection for site; identifying tree farming systems that match farmers' land, labour and socioeconomic limitations—including annual crops, tree crops, intercropping and understorey cropping options; tree management options to produce high quality products; pest and disease management; and soil management. Efforts should seek to develop a range of deliberate management techniques for trees and systems that enable farmers to produce quality products for specific market opportunities.

Smallholders generally have weak market linkages and poor access to market information (Hammett 1994; Arocena-Francisco et al. 1999). Working in the Philippines, Predo (2002) found that tree farming

was more profitable than annual crop production, but uncertain marketing conditions deterred tree planting. The existence of accessible markets for tree products is a vital criterion for site selection (Scherr 1995, 1999; Landell-Mills 2002); otherwise, the development of economically viable systems is doubtful.

In summary, the following factors seem to have strong bearing on the successful development of market-oriented smallholder agroforestry systems: (i) secure land tenure/use conditions; (ii) supportive policy conditions; (iii) access to and knowledge regarding the management of quality germplasm; (iv) tree management skills and information; and (v) adequate market information and linkages. The first two factors (land tenure and policy support) are basic enabling conditions, required to facilitate the development of smallholder systems. Developing supportive tenure and policy conditions often requires broad-based negotiations that include participation from local, regional and national governments as well as the private sector and community organisations. A central part of such negotiations is determining just what environmental services require careful regulation (Fay and Michon 2005). Successful negotiations lead to consensus land management agreements and natural resource security for local farmers. The other three factors (quality germplasm, tree management and market linkages) are technical issues that can be effectively addressed at the local level by government extension agencies, non-government organisations (NGOs), farmer organisations or individual farmers.

The World Agroforestry Centre and Winrock International have worked on these three technical factors in South-East Asia since the early 1990s. Our experience indicates that these factors can be successfully addressed through a replicable and efficient extension approach designed to reach motivated and innovative farmers who are committed to improving their incomes by increasing production and market access for their agroforestry products (Roshetko et al. 2004a). The approach includes emphasis in three components: market studies and analysis to appraise the existing and future demand for products that are or can be produced by farmers; farmer group extension to help farmers address market opportunities; and farmer group evolution towards farmer enterprise development when appropriate. These three components are interdependent and conducted simultaneously, with technical assistance and farmer group

development based on market opportunities. This paper documents our experience with this approach and its three components.

Market studies and analysis

Experience in Indonesia indicates that farmers generally: (i) lack access to market information (product demand, specifications and prices); (ii) lack understanding of market channels; (iii) produce products of unreliable quality and quantity; (iv) rarely engage in grading or processing to improve product quality (and their profit margin); and (v) sell their products as individuals (not through groups to achieve economies of scale). These conditions also have negative consequences for market agents. They spend a lot of time and resources searching for, collecting and sorting smallholder products to get a sufficient quantity of mixed quality. The time and effort of engaging farmers is a main reason given by market agents to explain why farmers are paid low rates for their products (Roshetko and Yulianti 2002; Tukan et al. 2006a). In order to enhance farmers' livelihoods and develop agroforestry-based enterprises, the shortcomings mentioned above should be documented and then addressed.

In our approach we conduct market surveys using a rapid survey format modified from ILO (2000) and Betser (2001) to identify and understand: (i) the agroforestry species and products that hold potential for farmers (their specifications, quantities, seasonality and the like); (ii) the market channels that are used and hold commercial potential for smallholder products; (iii) the marketing problems faced by farmers and market agents; (iv) the opportunities to improve the quantity and quality of farmers' agroforestry products; and (v) market integration (through vertical price correlation and price transmission elasticity) and efficiency.

We start with informal visits to make observations in the study area and hold discussions with farmers and other stakeholders. The information from these visits and knowledge gained from relevant secondary information is used to customise the market survey. The survey is then conducted with farmers, market agents and other key stakeholders within the project area. The information provided by each respondent is followed through the market chain to the end consumer until information concerning the market channel is complete. The information gathered is cross-checked with direct observation and informal

discussions with relevant respondents and different groups of stakeholders in the project area. The cross-checking process continues until the information gathered is clear and consistent, and no new information is found. A draft summary of the information is then shared with stakeholders in a formal meeting or workshop. This provides opportunity for additional cross-checking with individual and groups of stakeholders. Any inconsistencies or gaps in the information are identified and addressed through further field investigation. Once these questions are answered the summary of ‘farmer marketing conditions and priorities’ (priority species, marketing channels and agents, farmers’ market roles, marketing problems and opportunities) is finalised. At this point, work plans are developed to identify what actions farmers, market agents and other stakeholders agree to take to improve the production and marketing of small-holder products.

Our approach is an iterative process. It utilises relevant information gathered from participatory appraisals (both individual and group discussions) with various stakeholders, direct observation, detailed surveys and secondary data sources. Its iterative feature and the utilisation of multiple sources allow all the information and data to be reviewed and checked for accuracy. Appropriate planning is a prerequisite for successful implementation of the marketing approach as well as for each component activity.

Farmer group extension

The farmer group extension approach seeks to empower motivated farmers to enhance and diversify the productivity and profitability of their agroforestry systems to seize market opportunities, both existing and developing. This approach can also be used with NGOs. Initial training is provided to farmer or NGO leaders so that they may: (i) analyse existing conditions and problems; (ii) identify technical options; and (iii) set work agendas. According to work agendas, more intensive follow-up assistance is provided to farmer groups that these leaders have helped organise. The approach is flexible and dynamic, adjusting to the actual conditions of the target communities. It is also informal, practical, impact-oriented and focused on priorities identified by target communities. To avoid wasting resources and time, efforts are made to keep the structure and process of the farmer group approach simple and straightforward.

Farmer leader training workshops focus on species, systems, problems, markets or other priorities. Common topics include seedling propagation and nursery management, tree and agroforestry system management, farmer–market linkages and farmer-operated commercial enterprises. Training events are participatory and typically planned and conducted in the following manner: After initial discussions, staff develop a training curriculum that is then reviewed by farmer leaders. During the events, staff or other resource persons provide relevant background information and then facilitate discussions. Working group sessions are held for farmer leaders to share and compile their experience and knowledge on relevant topics. Working groups then report to all participants in a plenary session. Practical sessions are common. The training events build the technical capacity of farmer leader participants. More importantly, the training exposes leaders to new ideas and helps them recognise the depth of their own knowledge and the capacity they can offer to local community development. The training is very valuable in motivating the farmer leaders and helping them identify appropriate local priorities. The development of draft work plans is an integral part of each training event.

Following training workshops, staff assist farmer leaders or NGOs to: (i) share the workshop ideas and results with a greater number of farmers, and (ii) review, revise and implement the work plan drafted at the workshop. These follow-up technical assistance activities may include farmer meetings, mini-training, and field implementation such as nursery construction and operation or farmer demonstration trial establishment and management (Roshetko et al. 2005). The activities are mutually supportive and integrated so that the objectives and topics of each activity are relevant to the objectives and results of earlier activities. The follow-up assistance forms a continuous flow of contact and activities between the farmer groups and staff. Activities are implemented through three main channels: (i) staff facilitating and monitoring progress towards achievement of farmer groups’ objectives on a periodic (monthly, bi-weekly) basis; (ii) staff and other technical specialists (including market agents) providing subject-specific technical assistance as requested by farmer groups; and (iii) farmer-to-farmer and farmer group-to-farmer group technical assistance on an informal basis, with facilitation by staff (see Figure 1).

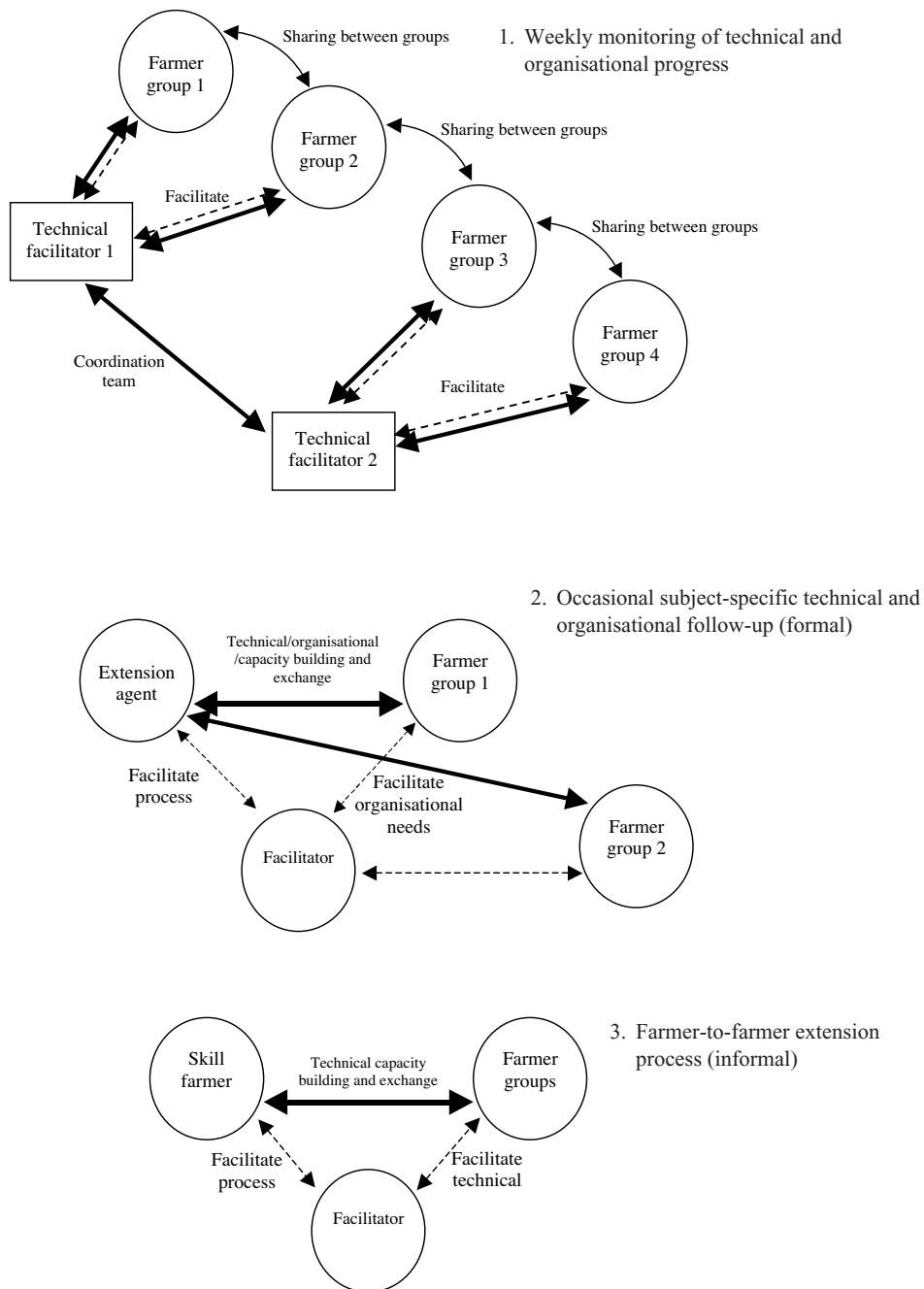


Figure 1. Channels to implement farmer group extension activities

The first channel assures frequent contact, enabling staff to assist farmer groups to concentrate on their objectives and plans, monitor and gauge progress and, if necessary, change their objectives. The second channel enables staff or other specialists to provide technical assistance related to previous activities or new topics requested by the group. These two channels allow staff to assist farmers develop their organisational capacity and provide opportunities to coordinate activities between farmer groups; they are important early in a program or series of activities. Experience indicates that the greatest impact is achieved through the third channel, farmer-to-farmer and farmer group-to-farmer group technical assistance. Farmer specialists are farmers themselves and intimately understand the conditions and concerns of fellow farmers. Their language and communication style is readily understood by the farmer participants. More comfortable under such conditions, farmer participants ask questions and offer their own experience more often when farmer specialists are leading sessions. Active farmer participation leads to greater learning and sharing of knowledge. In the third channel staff retain a role in providing technical input, but their main role evolves to facilitating the extension process. A key function of staff is to identify additional local ‘farmer specialists’ and communities where successful ‘farmer-based enterprises’ are located. Identifying these farmer specialists leads to a strong network of farmers, farmer groups, technical specialists and related institutions—including market agents.

The third channel and resulting farmer network can lead to spontaneous farmer adoption, spontaneous farmer-to-farmer extension and expansion of the farmer network. This may be the single greatest impact of the approach. For example, in Nanggung, West Java, the International Centre for Research on Agroforestry (ICRAF)/Winrock team helped strengthen or form eight farmer groups that established eight tree nurseries. As the success of program activities was recognised, farmers from neighbouring areas sought help from ICRAF/Winrock, but also directly from the program farmer groups. Those farmer groups helped neighbouring communities develop eight subgroups and provide technical assistance, resulting in the establishment of an additional 38 group and individual nurseries. Using their own funds, some farmer groups even hired farmer specialists to provide training.

Box 1. Farmer groups achieve impact

Focusing on farmer groups or NGOs is an appropriate method to make efficient use of resources, reach a large number of farmers and promote the development of agroforestry-based enterprises. However, it is important to remember that the development or existence of ‘farmer groups’ is not an objective in itself. Farmer groups are an avenue to reach farmers, implement activities, affect change and achieve planned-for objectives. Farmer groups often change and may be ephemeral. Members come and go. The farmer group exists to serve the needs of the farmers—not the project, program or an outside institution. Successful farmer groups may disappear after farmers have learned all they can under group conditions. At such times it may be more appropriate for farmers to focus on individual action. Effort should not be wasted trying to maintain a farmer group that has served its purpose or is not a cohesive unit.

Farmer group evolution towards farmer enterprise development

The implementation of *market studies* and the *farmer group extension* components build farmers’ awareness of market conditions, enhance their technical skills, and strengthen or form community-based farmer groups. The development of market awareness, technical skills and a farmer group all facilitate the development of farmer-based enterprises. But what is an enterprise? An *enterprise* can be broadly defined as any *venture, project, endeavour, or activity*. We consider farmer-based enterprises as any activity that contributes to farmers’ livelihoods or incomes. We consider the role of ICRAF/Winrock is to assist or empower farmers to expand their activities (enterprises) to achieve improved livelihoods or higher incomes.

Experience indicates that initial efforts to expand farmers’ activities/enterprises should focus on:

- improving the quality and quantity of farmers’ products through intensification or expansion of their agroforestry system
- improving the quality and value of farmers’ products through sorting, grading and packaging
- transforming farmers’ products from the raw to the semi-processed state

- learning about markets (product demand and specification) and developing market access (identifying channels and developing linkages with agents).

The first point represents the intensification of farmers' usual activities. This typically involves the use of more or better agricultural inputs (improved germplasm, fertilisers, pesticides and labour) and, most importantly, better planning to develop and utilise deliberate management regimes that will yield quality products to meet market specifications. The next three points may represent new activities for most farmers, but are well within their capacity. Undertaking these activities also requires more inputs from the farmer—labour, time, capital, skills and planning. This is a significant investment for farmers that will be rewarded with higher incomes. The keys to success are (i) a well planned/executed market study and (ii) expanding farmer enterprises based on the market opportunities identified in the market study.

Any of the four activities mentioned above can be conducted more efficiently by a farmer group united in purpose and social context. Group members can share experience, knowledge, resources and responsibilities related to the enterprise for mutual benefit. It is an appropriate next step for the farmer group to assume a marketing role through proactive and cooperative involvement with willing market agents. This process should start small and gradually expand as the capacity of farmers, program staff and agents grows.

In most circumstances, additional opportunities exist for individual farmers or farmer groups to form businesses or associations that focus on:

- assuming transportation, wholesaling or other mid-channel activities
- processing materials and manufacturing finished goods.

Such enterprises require a profoundly different set of resources, information, skills, planning and capital than are available to most individual farmers or farmer groups. They also require a lot of financial risk. Forming and operating those types of enterprises is not an easy progression and should be carefully evaluated before being pursued. Observation indicates that the development of such enterprises may depend on an outside champion or local leader who is connected and knowledgeable regarding the operation of the enterprise and/or is able to shoulder financial risk. It is advisable that most farmer groups

focus on: (i) the capacity to produce reliable quantities of high quality products; (ii) establishment of permanent and profitable market linkages; and (iii) development of sufficient entrepreneurial capacity to assure financial success before considering other enterprises. In other words, mastering the four activities listed previously is a prerequisite before considering forming enterprises that tackle these other activities.

Discussion

ICRAF/Winrock have implemented market analysis, farmer group extension and farmer enterprise development components across a range of locations over different time periods and at various intensities. The components have been used both separately and as a whole approach. The following discussion cites examples of impact where the components and the whole approach have been used by ICRAF/Winrock, or where similar approaches have been applied by associates.

Indonesia has a large area of degraded lands and a long history of both government and privately organised reforestation and tree planting activities. Tree seed is a key input for conducting these activities. With encouragement from government organisations, private seed companies, NGOs and their own activities, farmers often source the tree seed, operating seed collection enterprises at the family or farmer group level. Based on orders for specific quantities and species, farmers collect, dry, clean, grade and even package tree seed. Some individual farmers and farmer groups even plant trees for the purpose of seed production. In the Wonogiri–Ponorogo area of Central and East Java it is estimated that up to 22,500 farmers are involved in tree seed collection activities annually. These farm families earn Rp795,000 to Rp275,000 from their seed collection enterprises; this equals 66–33% of their 3-month dry-season income (Roshetko et al. 2004b). An ICRAF/Winrock survey of associates indicates that 15 of 22 NGO respondents are involved in tree seed enterprises directly or through farmer group partners. In total these enterprises sell 16 tons of seed annually, earning a gross income of Rp36 million (Harum et al. 2006). NGOs consider tree seed enterprises as positive programmatic components that provide tree seed to support their planting activities and income to offset operational expenses. Farmers, farmer groups and NGOs have developed the market awareness,

technical skills and market linkages to operate viable tree seed and seedling enterprises. ICRAF/Winrock work with these individuals and organisations in Indonesia and the Philippines to strengthen their enterprises. Market information, capital investment, policy support and technical training are the types of assistance these enterprises need to further expand their business (Carandang et al. 2006; Harum et al. 2006).

In Krui, Lampung, farmers have developed an agroforestry system based on the production of the resins damar (*Shorea javanica*), durian (*Durio zibethinus*) and duku (*Lansium domesticum*), and other fruit and timber trees. Over roughly a 100-year period, farmers have developed keen market awareness and market linkages with regional, national and international dealers. Farmers plant and deliberately manage these priority species for products that meet market demand. Farmers' roles includes harvesting, processing and grading fruits and resins. They are rewarded with higher prices for their high quality products (Michon et al. 2000). ICRAF and IRD (Institut de Recherche pour le Développement) have worked with these communities to enhance and document these locally developed agroforestry enterprises.

ICRAF/Winrock implemented all three components in Nanggung, West Java, to help farmers enhance their livelihoods through the development of agroforestry enterprises. Market studies identified a large unsatisfied demand in the greater Jakarta–Bogor area for five varieties of bananas (*Musa paradisiacal*). Results of the study included market specifications for different grades of bananas. ICRAF/Winrock conducted market awareness and technical training for interested farmer leaders in banana production, handling and marketing. We also revitalised farmer groups and conducted mini-training for a larger number of interested farmers. Market agents enthusiastically participated in these activities. Farmers and agents agreed that initial efforts would focus on improving postharvest practices; farmers assuming fruit grading responsibilities; and bananas being sold or purchased by grade weekly at a specific day, time and place. Through these efforts, participating farmers more than doubled their gross income from bananas (from Rp6,500–10,000 to Rp20,000/bunch) without incurring additional monetary costs. Farmers estimated that their involvement with bananas increased by 2 days/week, but the work was done in combination with other farm activities and

did not represent an increase in their overall workload. Agents and their staff did spend more time and effort with farmer groups, but their overall workload decreased because they dealt with 'groups' instead of individual farmers, received bananas that were already sorted by grade, and procured larger quantities or better quality bananas (Tukan et al. 2006b). After successfully developing this market link, farmers began to expand banana cultivation focusing on the five priority varieties identified by the market study, and to intensify cultivation according to recommendations made by ICRAF/Winrock (Tukan et al. 2006b). As a result banana productivity (fruit weight per stem) increased by 20–25%. Additionally, deliberate stem management and improved postharvest management increased the portion of farmers' banana crop that met market grade specifications from 50–60% to 85%. As a result of improved banana production, handling and marketing practices, farmers report that their agriculture-based income has increased by about Rp2,161,000/year, representing an increase of 152% (Roshetko and Tukan 2006).

Similar processes have been used at other sites in West Java, where farmer group partners of ICRAF/Winrock have made field visits to study successful farmer-based enterprises. In Purwakarta and Cimande, Bogor district, an agriculture development project implemented by the District Agriculture Office from 1990–94 promoted the production and marketing of mangosteen (*Garcinia mangostana*) and salak (*Salacca edulis*). After the project finished, district agricultural officers and farmer leaders maintained cooperation and forged linkages with regional and international markets. The farmer group enterprise is now well established and operates independently, while maintaining collaboration with the district agriculture officers. In 1998 farmers in Cipaku, Bogor district, developed an enterprise focused on durian production and marketing though the assistance of the Fruit Research Agency in Bogor. A direct market linkage was developed with Jakarta-based agents, who guarantee a high price for quality fruit. This linkage benefits both the producer (farmer) and agent by avoiding local and district level collectors and agents. Farmers protect this lucrative market linkage by maintaining high-quality products through deliberate management of their durian gardens. Cipaku farmers have also diversified their enterprise by developing commercial tree nurseries that produce high-quality seedlings of durian and

other fruit species. These farmers have also become technical specialists and been hired by farmer groups in neighbouring villages and by projects in Aceh to provide ‘farmer-to-farmer’ technical training. Farmers and farmer groups from other parts of West Java frequently visit Nanggung, Purwakarta, Cimande and Cipaku, seeking to duplicate the successful farmer enterprises in those communities. In most cases these individuals and groups lack the knowledge, experience, resources and confidence to start an enterprise themselves. Empowering such farmers and farmer groups to initiate agroforestry enterprises is an important role for development organisations, research organisations, NGOs and government agencies.

Conclusions

Commercial opportunities exist for farm communities to transform their traditional agroforestry systems using market orientation. To achieve this transformation, smallholder farmers must develop intensive, deliberately managed systems designed to yield quality products of priority species that meet market specification. Most farmers are ill-prepared for this challenge because their traditional extensive management approach produces small quantities of many products, primarily for household consumption, and limits market sales. Based on experience at multiple sites in Indonesia, ICRAF/Winrock recommend a replicable and efficient extension approach designed to reach motivated and innovative farmers who are committed to improving their incomes by increasing the production and market access for their agroforestry products. The approach includes three components: (i) market studies and analysis; (ii) farmer group extension; and (iii) farmer enterprise development. Training and activities undertaken in the farmer group extension and enterprise development components are based on market opportunities identified by the market survey. Initial attention is focused on farmer leaders, who then help extend more intensive follow-up assistance to farmer groups they have helped to organise. The approach is flexible and dynamic, adjusting to the conditions of target communities. The approach can also be used with NGOs. The approach defines *enterprises* broadly as any *venture, project, endeavour* or *activity*. Experience shows that farmers are best positioned to enhance their agroforestry-based incomes through the following activities (enterprises): (i) improving

the quality and quantity of their products through intensification or expansion of their agroforestry system; (ii) improving the quality and value of their product through sorting, grading and packaging; (iii) transforming their product from the raw to the semi-processed state; and (iv) learning about markets (product demand and specification) and developing market access (identifying channels and developing linkages with agents). These four activities can be efficiently implemented through a farmer group united in purpose and social context. It is a natural next step for the farmer group to assume a marketing role through proactive and cooperative involvement with willing market agents. Program staff have the role of initiating and facilitating the approach and program activities. Farmer leaders, farmer specialists and market agents should be involved in planning and implementation from the start, and in time assume a leading role. Experience shows that farmer leaders, farmer specialists and market agents are keenly interested in the approach. The technical capacity, leadership qualities and confidence built through involvement in the approach benefit these stakeholders and lead to spontaneous farmer-to-farmer extension and spontaneous adaptation of program-promoted technologies by non-program farmers. We suggest that this approach has great potential to strengthen the success of national reforestation programs and environmental service programs through the development of market-based rewards.

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Feasibility of community-based forestry management in partnership with a forestry district agency (case studies: Sumbawa and Bima, West Nusa Tenggara)

Ani Adiwinata Nawir¹, M. Ridha Hakim², Julmansyah³, Ahyar H.M.A.⁴ and Soni Trison⁵

Abstract

A wide range of community groups are engaged in formal partnerships with the forestry district agencies to manage community forestry in teak plantations, including those of the Sumbawa and Bima Districts of West Nusa Tenggara province. In each case a memorandum of understanding has been signed to establish a partnership agreement between the community group and the forestry district agency. However, implementation and technical guidelines including a clear revenue-sharing agreement between the partners have not been defined. Such guidelines are important in securing community commitment to managing the areas in a sustainable way. Each partnership agreement should include a sound economic assessment of the venture. The objectives of this study are to assess the financial and economic feasibility of partnership schemes, to identify and assess the social and economic aspects and impacts of long-term forestry partnership schemes and to estimate revenue sharing outcomes for a number of partnerships.

Results from financial analyses reveal that community-based forestry management partnership programs are potentially feasible over the long term, generating positive net present values (NPV). Results from broader economic analyses that take environmental and social costs and benefits into consideration reveal negative NPVs, meaning the social opportunity costs are high. Taking into account the costs and benefits of environmental and social aspects justifies a higher proportion of returns going to the community under a revenue-sharing agreement. Partnerships have increased community responsibility to maintain and control plantations and their standing stocks. However, it also raises the community's expectation of a secure share of the revenues from planted forests. Some challenges for community forest management in West Nusa Tenggara include lack of secure rights for the community to harvest planted teak in state forests; underdeveloped community institutions at the village level; high potential for forest exploitation (when there is increasing external demand); and inadequate local government capacity to lead implementation on the ground.

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Kemungkinan perekonomian pada pengelolaan kehutanan berbasis kemasyarakatan dalam kerjasamanya dengan dinas kehutanan di kabupaten (studi kasus; Sumbawa dan Bima, Nusa Tenggara Barat)

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Abstrak

Keaneka ragaman kelompok masyarakat bergabung dalam kerjasama resmi dengan dinas kehutanan untuk mengelola kehutanan pada perkebunan jati, termasuk di dalamnya kabupaten Sumbawa dan Bima di propinsi Nusa Tenggara Barat. Pada masing-masing kasus penandatanganan memorandum of understanding (MOU) telah di lakukan untuk menciptakan kesepakatan antara masyarakat dengan dinas kehutanan di kabupaten. Akan tetapi, panduan tehnik dan implementasinya termasuk kesepakatan pembagian hasil pada masing-masing pihak belum jelas. Panduan seperti yang di maksud sangat penting sebagai jaminan komitmen masyarakat dalam pengelolaan daerah secara berkelanjutan. Tiap kesepakatan kerjasama harus mencakup perhitungan ekonomi kerja. Sasaran dari studi ini adalah untuk memperhitungkan financial dan perkiraan ekonomi dalam skema kerjasama, untuk mengidentifikasi dan memperhitungkan aspek social ekonomi serta dampaknya pada skema kerjasama kehutanan jangka panjang dan perkiraan hasil pembagian keuntungan pada beberapa kerjasama.

Hasil dari analisa keuangan menunjukkan program kerjasama pengelolaan kehutanan berbasis masyarakat berpotensi untuk dapat dilaksanakan sebagai program jangka panjang yang dapat menggerakkan net present value (NPV). Hasil dari analisa ekonomi yang lebih luas yang memerlukan lingkungan, biaya social dan keuntungan dalam pertimbangan, menunjukkan NPV negative, itu berarti biaya kesempatan social tinggi. Dengan mempertimbangkan biaya serta keuntungan pada lingkungan dan aspek social memenuhi proporsi lebih tinggi pada lanjut kehidupan masyarakat dibawah perjanjian kerjasama usaha. Kerjasama tersebut telah meningkatkan tanggung jawab pada masyarakat dalam menjaga dan mengendalikan perkebunan serta persediaan. Akan tetapi, hal ini juga telah meningkatkan harapan pada masyarakat atas jaminan pembagian atas hasil tanaman. Beberapa tantangan yang dihadapi pada pengelolaan hutan masyarakat di Nusa Tenggara barat termasuk keterbatasan jaminan akan hak panen pada perkebunan jati di hutan daerah; institusi masyarakat tertinggal di tingkat desa; potensi tinggi dalam pengexploasian hutan (pada waktu adanya kenaikan permintaan dari luar);serta kemampuan pemerintah dalam memimpin pelaksanaan lapangan tidak memadai.

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Background

Forestry management in Indonesia has shifted gradually from state-based forest management to community-based forest management. This has mainly happened since the reformation era began and with implementation of the decentralisation policy in 1998. Social forestry has become the main umbrella approach for Indonesia's five forestry strategic programs covering the period 2001–04. Social forestry arrangements are developed under a partnership or co-management approach. Under such arrangements local people are the main actors in decision-making regarding management of state forests (Suharjito 2005).

Smallholder timber production on mainly private and/or communal land under a partnership agreement between a community and a second party, such as the local forestry district agency (Dinas Kehutanan Kabupaten), has increasingly become an alternative to meeting economic, social and ecological objectives, such as rehabilitating degraded forest areas. Partnerships between the community and companies/forest industries are important mechanisms for transferring the benefits from forestry plantation development to local people (Figure 1).

Despite a good number of partnership programs initiated by the Ministry of Forestry, there are not many examples of successful partnerships for the following reasons (Nawir et al. 2003; Nawir and Santoso 2005):

- Most partnership programs have been developed from the top down (government-initiated partnerships).
- Principles of a mutually beneficial partnership, embracing social, economic and management aspects have not been applied.
- There has been a lack of careful consideration of the long-term financial and economic feasibility and the capacity to ensure shared benefits for the parties involved in the partnerships.
- There has been a lack of fair valuation of inputs invested by both parties as the basis for defining the contractual agreement
- Mutual economic and social objectives have not been discussed and negotiated between the parties involved.
- Parties involved in the partnerships have not clearly understood the social and economic risks involved in a partnership.

Understanding the economic feasibility and social implications of a range of partnership schemes is an important basis for negotiating agreement on revenue sharing and for securing commitment from the community's partner to a long-term partnership arrangement. Given this situation, a study focusing on assessment of the economic feasibility of community forestry managed under partnership was conducted in the districts of Sumbawa and Bima in West Nusa Tenggara. The aim of the study was to assist the local forestry district agency to design efficient and effective revenue-sharing agreements for partnerships with tree grower groups (*Koperasi Tani Hutan*).

Objectives

In the District of Sumbawa the government endorsed a local regulation, *Perda-Peraturan Daerah* no. 25, 2002, on community-based forest resources management, or *Pengelolaan Sumber Daya Hutan Berbasis Masyarakat* (PSDHBM), with reference to the Ministry of Forestry (MoF) decree no. 622, 1997, on community forestry. Under this Perda, communities are now an important part of sharing the responsibilities of forest management with other stakeholders such as government and NGOs. Sharing responsibilities is relevant to overcoming the limitations of the forestry district agencies in handling forest management and its problems, mainly due to limited human resources and funding. Following this Perda as the umbrella law, the forestry district agency determined six priority locations on former state company (Perhutani) land within production forests to implement PSDHBM models. The MoF responded very well to this initiative by assigning the Social Forestry Program to some of these locations. All these initiatives implemented under partnership schemes are included in a memorandum of understanding (MoU). However, technical and implementation guidelines have not been drafted due to the lack of a clear basis for defining profit sharing, which is critical to securing the commitment of communities to a MoU.

In contrast to Sumbawa, forestry development in the District of Bima remains focused on technical aspects instead of putting priority on community participation and institutional development. The lack of a local regulation to provide an umbrella law (*payung hukum*) has been an impediment to accelerating progress on community-based forestry management (CBFM) initiatives under partnerships.

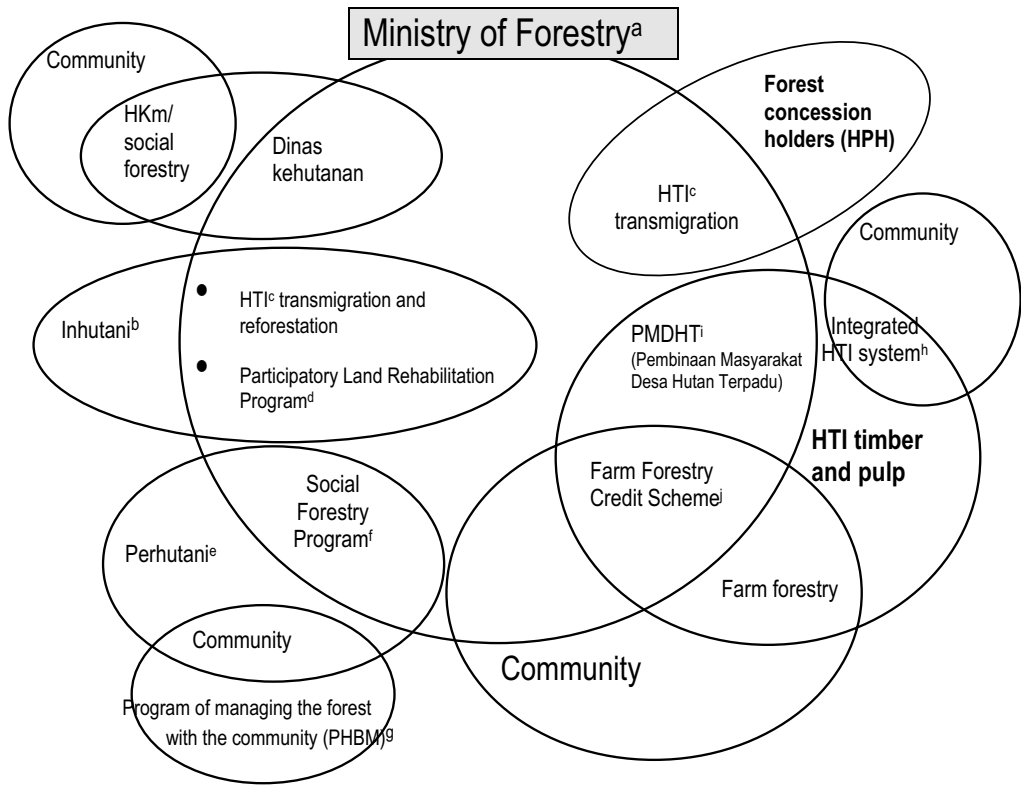


Figure 1. Partnership programs initiated by government and companies

Notes:

- ^a Government programs since 1970s under the control of Directorate General of Social Forestry and Land Rehabilitation and/or Directorate of Forestry Plantation Development within the Directorate General of Forest Production Development Program (*Direktur Jenderal Bina Produksi Kehutanan*).
- ^b Inhutani is a state company with the responsibility to manage production forests in outer islands and to rehabilitate logged-over forests.
- ^c HTI, *Hutan Tanaman Industri*, is a timber plantation concession granted by the Ministry of Forestry to the companies.
- ^d Participatory land rehabilitation program was still at preliminary formation and there were no complete guidelines during the period of former Minister Nur Mahmudi (early 2000).
- ^e Perhutani is a state company with the main responsibility of managing teak plantations on Java.
- ^f The social forestry program during the 1970s–1980s mainly focused on providing opportunities for local people to practice *Taungya* inside teak plantations.
- ^g Managing the forest with the community or PHBM, *Pengelolaan Hutan Bersama Masyarakat*, was initiated (early 2000) by Perhutani which focuses on providing revenue sharing from harvested teaks.
- ^h Integrated HTI system, which is not a common practice in timber plantation development in Indonesia, focuses on developing timber plantation under partnership schemes (Potter and Lee 1998).
- ⁱ Social Forestry Program called PMDHT (*Pembinaan Masyarakat Desa Hutan Terpadu*).
- ^j Farm Forestry Credit Scheme or *Kredit Hutan Rakyat* was mainly provided from reforestation funds and stopped in 1998. The credit was provided to the community with a competent business partner, such as a timber plantation company, both concession and non-concession holders.

Source: Revised from Nawir et al. (2003)

At the community level, collaborative management has become a necessity. It is a viable alternative to improving forest management and household incomes. However, the government doubts whether the partnership scheme is the right option to move forward. There are still some differences in understanding the concept of CBFM among stakeholders. Providing information based on objective analysis of potential benefits of collaboration may help in establishing a clearer understanding of the implications of CBFM. Furthermore, with better understanding of the consequences of CBFM, an appropriate Perda could be drafted as the basis of strategic discussion among stakeholders searching for better forest management alternatives.

This study has four objectives, as follows:

- to analyse the economic and financial feasibility of partnership schemes, which is important in providing transparent information to key stakeholders and for ensuring the economic viability of long-term commitments to partnerships
- to identify and understand the social costs and benefits of smallholder plantation development under partnership schemes (This is crucial to ensuring the long-term continuity of partnerships based on mutually beneficial terms. Assessment will generally be qualitative, although quantification will be done wherever possible.)
- to understand the ecological impacts associated with the development of small-scale plantations within partnership schemes qualitatively and/or by drawing on secondary sources
- to calculate the proportion of revenue sharing under various partnerships/CBFM programs.

All of the information mentioned above will be included in the technical/implementation guidelines of Perda CBFM for the Sumbawa District, and will provide inputs to the design of a similar Perda for the Bima district.

Methodology

Assessment of the economic feasibility of community forestry⁶ managed under partnership was conducted using participatory cost and benefit analysis that was developed from Perkins (1994). Multi-

stakeholder teams, including community members, participated in all stages of the processes, namely designing the research approach, data collection, data analysis, verification (triangulation) and dissemination. Figure 2 illustrates the participatory process. Participatory assessment was selected given that there are many stakeholders involved in smallholder partnerships, as well as to accommodate the following objectives: (i) to reach mutual agreement on each component of costs and benefits to be included in the analysis; (ii) to build ownership of the results of the analysis among all stakeholders; (iii) to encourage shared learning between researchers and stakeholders involved in the partnerships, and (iv) to ensure effective dissemination and adoption. The study was conducted during the period July 2004 to September 2005 in Sumbawa and Bima districts of the province of West Nusa Tenggara (WNT). The case study villages were selected on several criteria: (i) the existence of an ongoing partnership scheme; (ii) being representative of most partnership schemes being implemented; (iii) distance to market; (iv) low level of conflict over land status; and (v) diversity of trees species.

Two major analyses were conducted. First, financial analysis assessed actual cash expenditures and cash receipts expected to be incurred by smallholders. This is equivalent to a cash flow analysis. Second, economic analysis extended the financial analysis to include estimates of social and environmental costs and benefits associated with community forestry partnerships. This includes external costs and benefits.

For the financial analysis, information collected focused on cash costs borne, and potential benefits to be received, by both parties involved in the partnership, i.e. community members and government (forestry district agency). For Sumbawa, since the initial investment was made by the state forest company (Perhutani), budget figures from this investment were also collected. Perhutani left the areas in 2000 and they are now under the responsibility of the forestry district agency (*Dinas Kehutanan*). The potential benefits of harvested timber will be shared between the forest district agency and the community. Understanding the historical time lines is important as the basis to develop cash flow scenarios, as well as visualising the process to identify environmental and social impacts.

For the economic analysis, costs and benefits of environmental and social aspects were also collected

⁶ A complete manual on participatory economic feasibility assessment of community forestry will be published in a forthcoming CIFOR Working Paper.

to complement the direct costs and benefits of the financial analysis. The collected information focused on community perceptions of changes in impacts in relation to identified environmental and social indicators comparing the situation before and after the areas were managed under community partnerships. In the case of intangible costs and benefits, quantification and prices were estimated in consultation with community members using the participatory rural appraisal (PRA) method (Abbot and Guijt 1998; Guijt 1998) during focus group discussions (FGD) in both the studied and the neighbouring villages.

Indicators used in analysing the feasibility of the partnership cases are described below (Perkins 1994):

$$NPV = \sum_{t=1}^n \frac{Bt - Ct}{(1+i)^t}$$

Net present value (NPV) indicates the present value of benefits (*B*) less the present value of costs (*C*) for the total life in years (*t*) of the activity, after having been deflated by an appropriate discount rate

(*i*). Activities are considered feasible if they generate a positive NPV.

Benefit:cost ratio (BCR) indicates the ratio of the sum of an activity's discounted benefits to the sum of its discounted investment and operating costs. Activities are considered feasible if the BCR is greater than 1.

$$BCR = \frac{\sum_{t=1}^n \frac{Bt}{(1+i)^t}}{\sum_{t=0}^n \frac{Ct}{(1+i)^t}}$$

The total period included in the analysis was based on the longest rotation period, which was 25 years for growing teak. The discount rate used was 13% following the interest rate for saving purposes in the commercial banks. The 13% discount rate is an alternative option for community members wishing to invest their money and is selected due to the need for investors to receive quick returns.

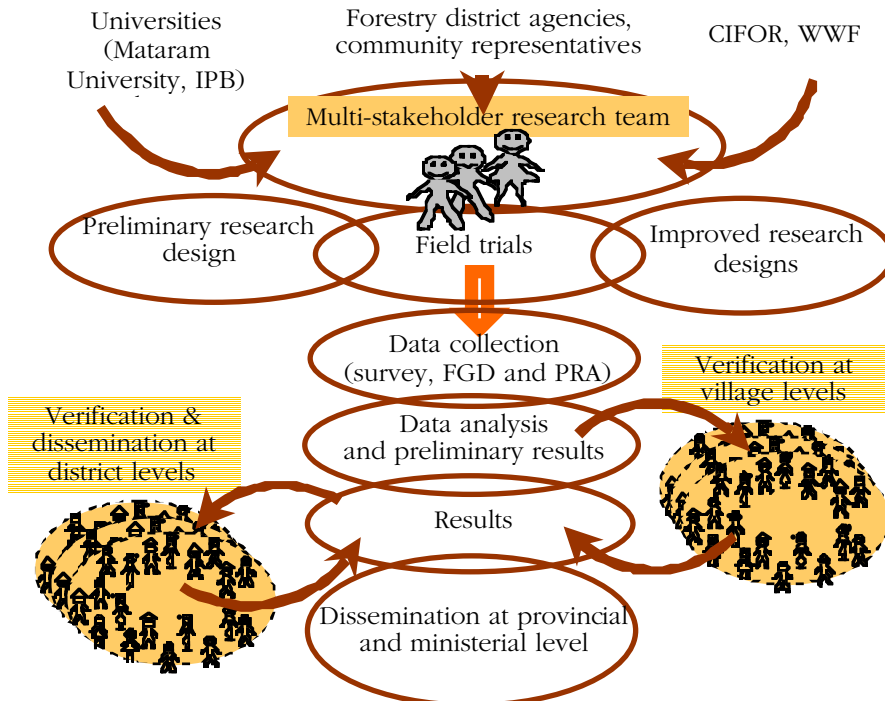


Figure 2. Flows of participatory assessment of the economic feasibility of community forestry managed under partnership

Results and discussion

Categories of partnership and community-based forest management programs

The research was conducted in the province of West Nusa Tenggara (WNT) in Sumbawa and Bima districts (see Figure 3). The Sumbawa and Bima districts have the highest proportion of forest area compared with other districts in WNT: 48% for Sumbawa and 25% for Bima. Sumbawa is considered to be a progressive district in WNT and in comparison with other provinces, as demonstrated by its umbrella law to support CBFM. On the other hand, Bima is very well known for its potential for farm forestry, with some 8,000 ha available in WNT.

In the province of West Nusa Tenggara, about 60% of the total population, or 5 million people, are below the poverty line, earning Rp. 110,487 per capita month in Sumbawa and Rp. 83,945 per capita month in Bima (BPS 2001). Rice production has been the main source of household basic needs, and land required to cultivate dry paddy often has been the main reason for communities to clear planted trees inside the forest areas. In Bima, limited application of advanced technologies in rice cultivation and lack of production inputs such as fertilisers have caused low rice production yields from dry paddy fields (around 500 kg per ha) compared with the production levels in other areas; e.g. for Sumbawa average yields are 900 kg per ha. However, on lower lands with better irrigation systems, rice production is higher at 2.5–3 tons per ha. Other sources of household income are from non-

timber forest products (NTFP) such as candle nuts, cashew nuts, rattan, medicinal plants and *gaharu*.

Three villages in Sumbawa district and three villages in Bima district were selected to represent different categories of ongoing partnerships or CBFM programs as shown in Table 1.

Community forestry (Hutan Kemasyarakatan or HKm) program

This program was initiated in 1999 on areas where Perhutani (state forest company) developed a teak plantation in 1992, as directed by the Ministry of Forestry. In 2000, Perhutani left the area and the forestry district agency, following MoF policy, included the area as part of the Community Forestry Program or *Hutan Kemasyarakatan* (HKm). Multicropping with cashew nuts had been practised in these areas before the Perda was enacted in 2002 so the community already had access to cultivated agricultural crops. Under the Perda, the forestry district agency initiated several pilot sites of the CBFM model, including one at Semamung that involved partnerships with community members represented by tree grower cooperatives. Under the partnership arrangement, community members have shared the responsibility for preventing illegal logging in this area.

Social forestry

Under the social forestry policy declared by the MoF, the forestry district agency established a pilot project on former state company areas of the Lamenta village production forest in 2004 to trial the social forestry model. A teak plantation was developed under a monoculture system where land pressure was low

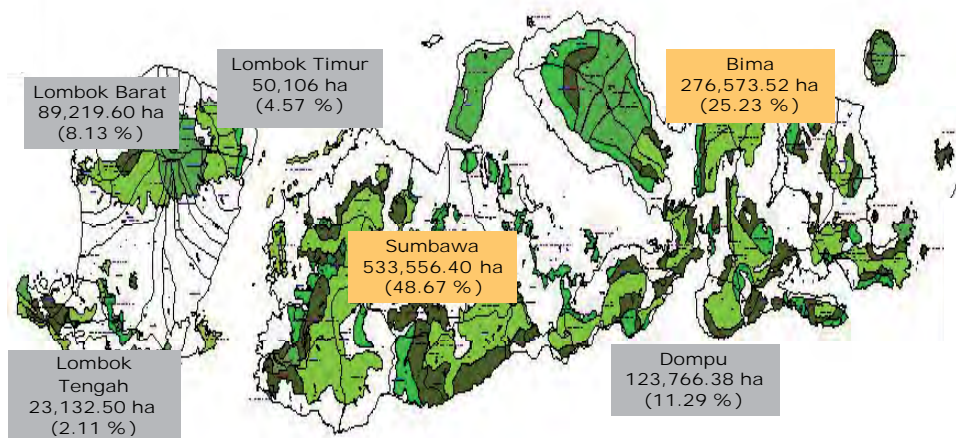


Figure 3. Locations of Sumbawa and Bima districts

because the community had separate fields for agriculture. The community has maintained the teak trees well, with standing stock at 60–80 % of the number of trees initially planted.

The program of UPUPM (Unit Percontohan Usaha Pertanian Menetap), or demonstration areas for sedentary farming system

Demonstration areas were developed outside of state forest areas and funded by the forestry district agency. Species planted included teak, cashew nuts, mahogany, jack fruits and mango. The project was initiated under a partnership arrangement between the cooperative and the community.

Teak coppicing project as part of a community forestry or Hutan Kemasyarakatan (HKm) program

Under allocated rights of community forestry (1999 to 2001–02), the community has continued to maintain the teak coppice after harvesting as part of a previous project implemented by the forestry district agency in the location. Initiatives were then expanded to include planting of other crops funded by the cooperative, such as candle nuts, spices, cashew nuts, jack fruits and mango. Teak will be ready for harvest in 2009 at age 25 years. The cooperative has been very active and is well developed, providing opportunities for outsiders to learn about this forestry extension program.

Small-scale plantation program

The forestry district agency provided funds for the community cooperative to establish a small-scale

plantation program in 2002 on 200 ha of damaged former state company land. Teak, mahogany and cashew nuts were planted.

Farm forestry

Farm forestry has been managed intensively by the local community since the 1970s and has resulted in one of the best teak plantations in the Bima district. Although the community mainly use their own funding for maintenance and replanting of the second rotation, initially the forestry district agency invested in village nurseries to provide seedlings. It also provided forestry extension programs to local cooperative members. The cooperative won the prize for the most successful afforestation program at the provincial level in 2002.

Financial analysis

Results of the financial analysis of the alternative agroforestry systems in the Sumbawa district are presented in Table 2. NPV per ha is highest for the social forestry project developed on former state company areas in Lamenta, Sumbawa (Rp 37 million per ha), and lowest is the community-managed forest in Marga Karya where NPV was negative Rp60 million per ha. Community participation in securing the standing stock of trees on former state company land in Lamenta, with only 20% of the originally planted trees lost, and new trees planted under the social forestry project, has resulted in the highest NPV per ha. Low community commitment to maintaining the standing stock under the sedentary farming system program in Marga Karya has resulted in 50% of planted trees being lost

Table 1. Research sites in the districts of Sumbawa and Bima

Districts	Villages (managed areas)	Previous management	Partnership/CBFM program
Sumbawa	Lamenta (1,670 ha)	Perhutani (1992–2000)	Social forestry (2004)
	Semamung (257 ha)	Perhutani (1996–2000)	Community forestry (HKm) since 2003
	Marga Karya (48 ha)	Demonstration areas for sedentary farming system (1997)	Community managed forest (2000)
Bima	Ntori (30 ha)	Planting contract with Dinas (1966–68)	Maintaining teak coppices under HKm (1999–2000)
	Nggelu (200 ha)	Perhutani (1996–2000)	Small-scale plantations (funded by Dishut) (2002)
	Nata (125 ha)	Village nurseries (1986)	Farm forestry (community funds)

and a financially infeasible community-managed forest scenario. The lack of commitment can be blamed on the absence of a clear management agreement between the community and the forestry district agency after the former program ended. The income from agricultural production on these lands was Rp 1,600,000 per year per household (from data collected during the household survey, 2004).

All of the schemes implemented in the Bima district are financially feasible, with each returning a positive NPV per ha. Returns were Rp 2 million each for the small-scale plantation funded by the forestry district agency in Nggelu and the farm forestry areas in Nata. The program on community lands has an advantage because there are less administrative costs in harvesting and transporting logs. Another important factor determining financial feasibility is the proportion of income received from timber compared with non-timber species. The higher the proportion of income from timber (not only teak), the more feasible the scheme is likely to be. In Ntori village, where 82% of income came from non-timber species (cashew nuts, candle nuts and other marketable products), the scheme proved to be just feasible.

In weighing up options it is useful to consider the dominant cost components affecting the feasibility of

the programs (Table 3). For options with a higher proportion of income coming from timber planted inside state forests, harvesting dominated the cost structures, ranging between 52% (Semamung) to 95% of total costs (Lamenta). Lamenta has considerably higher average standing stocks per ha of mixed ages and combined trees species (615 trees per ha) compared with Semamung (154 trees per ha). Harvesting costs for farm forestry conducted on community private lands are less significant than other costs, such as government investment—expenses for land preparation, seedlings and forestry extension services (43%), labour (18%) and non-timber tree seedlings (20%) (figures for Nata, Table 3). For options with a high proportion of income coming from non-timber species, dominant costs are mainly labour costs to cultivate the non-timber crops, ranging from 61% to 93% of total costs. Understanding dominant cost components is important for managing to avoid the risks of negative profits.

Income from timber (mainly teak) has an important role in the household economy, like savings, since a community will harvest the timber based on their needs. In Sumbawa and Bima, where dry periods are longer than in other regions of western Indonesia, timber production is important in household financial crisis situations during long dry seasons. However,

Table 2. Net present value (NPV) per ha of partnership/CBFM programs

Partnership/CBFM program	NPV per ha (Rp '000,000)	BCR	Proportion of total income	Factors influencing feasibility
Community forestry (HKm), Semamung	2.8	1.06	98% from timber (teak, mahogany, sonorkeling, johar)	65% of losses
Social forestry pilot project, Lamenta	37	1.08	98% from teak	<ul style="list-style-type: none"> • High commitment from community in securing the standing stocks from illegal logging (25% of losses) • New planted teak under social forestry program
Community-managed forest, Marga Karya	(60)	0.17	25% teak 75% non-timber	<ul style="list-style-type: none"> • 50% of losses • No clear management agreement
Teak coppices under HKm, Ntori	0.4	1.01	18% teak 82% non-timber	Significant revenue from a range of non-timber production (e.g. candle and cashew nuts)
Small-scale plantation, Nggelu	2	3.13	84% teak 16% non-timber	Good standing stocks
Farm forestry, Nata	2	2.63	97% teak 3% non-timber	On community lands (fewer administrative requirements, e.g. retribution fees)

low market prices (Rp460,000–Rp 900,000 per m³) and limited wood processing skills are restraining factors for community timber marketing in these areas. Lack of basic knowledge at the tree grower level, mainly in calculating the potential volumes of harvested timber, needs to be addressed by providing appropriate training; otherwise, the buyers and brokers will always take advantage of the situation.

Costs and benefits of environmental and social components

The economic benefits and costs that take into account environmental and social aspects of imple-

menting different partnership/CBFM programs were analysed. The analysis focused on changes in environmental and social indicators identified by communities based on comparing conditions before and after the partnership/CBFM programs were initiated. Results are presented in Tables 4 and 5. Quantifying the costs and benefits allowed estimation of the overall environmental and social NPV. The quantitative estimates are also useful in calculating revenue sharing.

Environmental indicators identified varied significantly between villages because they relate to historical conditions existing before plantations were established, e.g. primary or secondary forest condi-

Table 3. Dominant cost components on various partnership/CBFM program

Partnership/CBFM program	Dominant cost components
Community forestry (HKM), Samamung (98% teak)	<ul style="list-style-type: none"> • Timber harvesting (52%) • Labour (15%) • Fees and taxes (11%) • Government investment (19%)
Social forestry pilot project, Lamenta (98% timber)	<ul style="list-style-type: none"> • Timber harvesting (95%)
Community-managed forest, Marga Karya (25% teak, 75% non-timber species)	<ul style="list-style-type: none"> • Labour (93%)
Teak coppices under HKM, Ntori (19% teak, 82% non-timber species)	<ul style="list-style-type: none"> • Labour (61%) • Government investment (25%)
Small-scale plantation, Nggelu (84% teak, 16% non-timber species)	<ul style="list-style-type: none"> • Labour (57%) • Retribution fees and taxes (14%) • Government investment (15%)
Farm forestry, Nata (97% teak, 3% non-timber species)	<ul style="list-style-type: none"> • Government investment (43%) • Labour (18%) • Seedlings for non-timber species (20%)

Table 4. Environmental and social costs

Environmental and social costs		Present values (Rp'000,000)	%
Semamung	1. Warmer climates	741	42
	2. <i>Permanent</i> cultivation	914	51
	3. Fences for livestock	108	6
Lamenta	1. Replacing fuel woods with kerosene	920	13
	2. No more opportunity for cultivation	5,075	70
	3. Forest areas supervision	1,144	16
Marga Karya	1. Cooperative management	331	28
	2. Fences for livestock	863	72
Nggelu	1. Less water resources	92	56
	2. Soil erosion	23	14
	3. Less suitable land for rice production	49	30
Ntori	1. Land rent	415	100
Nata	1. Less water resources	261	55
	2. Land rent	207	43

tion. Some important environmental costs included lost opportunities to practise shifting cultivation (quantified by the costs to establish permanent cultivation areas in Semamung), and no more opportunities to cultivate agriculture crops because of shading by timber trees (as in the case of Lamenta).

Socially, important impacts include the time that is allocated to managing the cooperative as part of implementing the partnership/CBFM programs. Time allo-

cated for supervising the partnership/CBFM areas is often overlooked, for instance in Lamenta, but this has proved to be effective in controlling damage associated with illegal logging and encroachment of lands.

Revenue sharing

The calculation of revenue sharing uses both tangible and intangible (environmental and social) costs and benefits as shown in Figure 4. Including intan-

Table 5. Environmental and social benefits

Environmental and social benefits		Present values (Rp '000,000)	%	NPV (Rp '000,000)
Semamung	1. Farming opportunities	89	11	(1,003)
	2. Managing the cooperative	415	53	
	3. Rights to manage the forest	219	28	
Lamenta	1. Improved water irrigation	928	78	(6,029)
	2. Rights to manage the forest	234	20	
Marga Karya	1. Improved forest diversities	713	37	1,376
	2. More productive lands	792	41	
	3. Cooperative development	411	21	
Nggelu	1. Forest diversity	39	40	(1.06)
	2. Cooperative's rules	58	60	
Ntori	1. Less soil erosion	22	12	(268)
	2. Improved diversity	54	29	
	3. Improved soil fertility	20	11	
	4. Cooperative's rules	61	33	
	5. Good cooperative performance	25	14	
Nata	1. Cooperative's rules	2,030	99	(214)

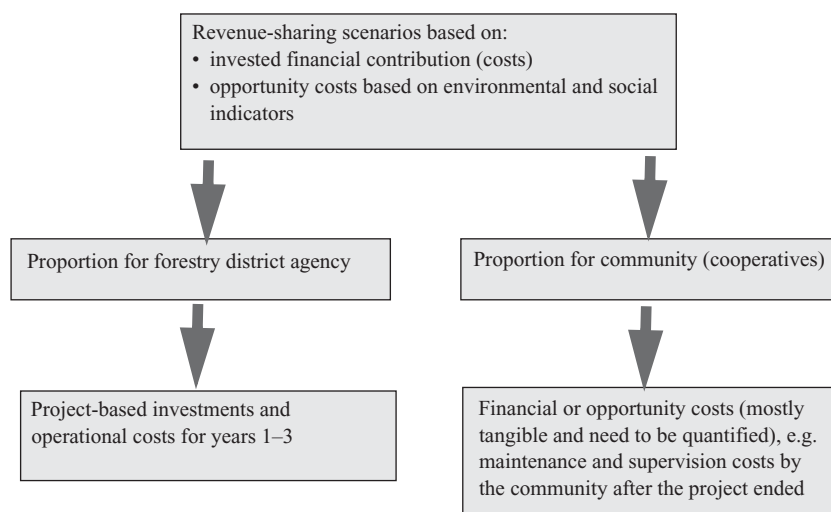


Figure 4. Invested costs by forestry district agency and community as the basis for revenue sharing scenarios

gible costs and benefits allows scenarios to also capture the opportunity costs to society of implementing various partnership/CBFM programs. The proportion that goes to the forestry district agency (representing government) is justified by all of the public investment made in various programs, such as the costs of buying seedlings of timber species and tree maintenance from years one to three. The proportion that goes to the community is justified by total direct expenses during the rotation period of 25 years, such as labour, tools and equipment, and seedlings of non-timber species. Negative returns associated with environmental and social indicators (represented by negative NPV) justify a higher proportion going to the community as part of the overall cost to society.

Table 6. Revenue sharing proportion under various partnerships/CBFM agreements in Sumbawa

Sumbawa	Revenue shares (%)	
	Financial	Economic
Lamenta Community	97.74	98.08
Forestry district agency	2.26	1.92
Marga Karya Community	97.98	94.69
Forestry district agency	2.02	5.31
Semamung Community	49.77	93.53
Forestry district agency	50.23	6.47

Based on the financial analysis, revenue shares for the community in Sumbawa range from almost 50% (community forestry in Semamung) to nearly 98% (social forestry in Lamenta), and for Bima range from 72% (farm forestry in Nata) to 93% (teak coppicing project in Ntori) (Tables 6 and 7). There are significant changes in revenue share in the communities under economic analysis scenarios that include environmental and social indicators. For community for-

estry in Semamung the share rises from 50% to 93%, and for farm forestry in Nata it increases from 72% to 91%. This happens because the community bears a higher share of the environmental and social costs of community forestry programs.

Despite the lower revenue share going to government (2–50%), there is potential for revenue from permit fees for harvesting and transporting the harvested timber or *Surat Keterangan Sahnya Hasil Hutan* (SKSHH). For the central government, there is also potential for revenues from fees for collecting timber in state forest or *Pungutan Sumber Daya Hasil Hutan* (PSDH).

Table 7. Revenue sharing proportion under various partnerships/CBFM agreements in Bima

Bima	Revenue shares (%)	
	Financial	Economic
Ntori Community	92.79	94.50
Forestry district agency	7.21	5.50
Nata Community	72.06	90.83
Forestry district agency	27.94	9.17
Nggelu Community	83.04	82.88
Forestry district agency	16.96	7.12

The potential for timber-based revenues for the government is quite high in Lamenta, mainly from administration costs of SKSHH and timber fees (PSDH). Analysis predicts perhaps Rp. 4.5 billion for the district government and Rp7.7 billion for the central government (Table 8). On the other hand there is no potential for revenue to the central government from farm forestry in Nata, since it is on private lands with no obligation to pay PSDH fees.

Table 8. Potential revenues for local and central governments (Rp '000,000)

Sumbawa	Retribution	Semamung	Lamenta	Marga Karya
	SKSHH (local government)		90	4,520
PSDH (central government.)		135	7,729	33
Bima	Retribution	Nggelu	Ntori	Nata
	SKSHH (local government)	37	2	21
PSDH (central government.)		233	12	–

Conclusions and recommendations

The results from the financial analysis reveal that the partnership/CBFM programs are potentially feasible in the long-term, with positive NPVs. Economic analysis that includes environmental and social costs and benefits has shown negative NPVs, which mean the social opportunity costs are high(er). Taking into account the costs and benefits of environmental and social aspects justifies a higher proportion of forestry revenues going to the community.

Partnerships have increased community responsibility to maintain and control plantations and the standing stock of trees. However, they have also raised community expectation of shared revenues from planted trees. Some challenges for community forest management in WNT include: insecure community rights to harvest planted teak in state forests; under-developed community institutions at the village level; high potential for exploitation (when there is increasing external demand); and lack of local government capacity to lead implementation on the ground.

Recommendations to improve the implementation of various partnerships and CBFM programs in Sumbawa and Bima include the following:

- There should be more explanation to stakeholders of the potential benefits of community forestry.
- A process to develop multi-stakeholder agreements (including central government—Ministry of Forestry) is required to secure community rights for harvesting teak. CIFOR and WWF are actively involved in a process to approach the Ministry.

- Scenarios and models to optimise production and returns from timber and non-timber species should be developed, in coordination with the Agricultural District Office or Dinas Pertanian.
- Multi-stakeholder forums should discuss ways to find better marketing strategies, especially in relation to preventing brokers from taking big profit margins. One option is to establish partnerships with local processing mills.

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Microcredit in rural development: requirement and recommendations for government support and intervention

Herbert Siagian and Jermias R.A. Manu¹

Abstract

One of the major problems of micro and small enterprises (MSEs) in Indonesia is access to capital, but, in fact, even if capital is provided, microcredit institutions do not exist or are unable to service microcredit for MSEs. This paper will discuss the kinds of institutions that are involved in providing microcredit in Indonesia and explore the kinds of microcredit that is offered to MSEs. Constraints and challenges that microcredit institutions face currently, and the efforts that have been, or should be, made to develop the role of microcredit institutions are discussed. Importantly, this paper makes recommendations for government actions to encourage the role of microcredit institutions.

Kredit mikro di pembangunan pedesaan: syarat dan rekomendasi pada pengaruh serta dukungan pemerintah

Herbert Siagian dan Jermias R.A. Manu^{1a}

Abstrak

Salah satu masalah utama yang dihadapi Usaha Kecil dan Menengah (UKM) di Indonesia adalah modal. Bahkan bila modal tersedia untuk usaha-usaha kecil di pasar, lembaga yang memberikan kredit usaha kecil tidak ada atau tidak mampu memberikan kredit mikro bagi UKM. Makalah ini akan membahas mengenai lembaga macam apa atau siapa yang terlibat di dalam menyediakan kredit mikro di Indonesia. Makalah ini juga membahas jenis kredit mikro yang ditawarkan kepada UKM sert menunjukkan hambatan-hambatan dan tantangan yang dihadapi oleh lembaga kredit mikro. Selain itu usaha-usaha apa yang telah dan harus dilakukan untuk membangun peranan lembaga kredit mikro. Yang paling penting makalah ini memberikan rekomendasi untuk dilakukan pemerintah dalam mendorong peranan lembaga-lembaga kredit mikro.

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Introduction

It is expected that micro and small enterprises (MSEs) will continue to dominate the business environment of Indonesia. Changes may occur because MSEs are becoming more linked due to advances in information technology. It does not occur spontaneously however and requires effort. In fact MSEs in Indonesia are facing various difficulties (Table 1).

Table 1. Difficulties for microbusiness

No.	Type of difficulties	Domestic small industries	Small industries
1	Capital difficulties/ access to capital	34.55%	44.05%
2	Raw material supply	20.14%	12.22%
3	Marketing	31.70%	34.00%
4	Other difficulties	13.60%	9.73%

Source: Data from Indonesian Central Bureau of Statistics, analysed by Ismawan (2003)

Table 1 illustrates that microcredit is a strategic factor for the development of MSEs. There are about 40 million MSEs in Indonesia, meaning 98% of business entities in Indonesia are waiting for microcredit. Based on the supposition that the average enterprise need for microcredit is about Rp1 million, funds needed for microcredit are substantial at about Rp40 trillion. Referring to the notes of *Harian Bisnis Indonesia* (2003), the number of non-bank microcredit institutions is about 9,000 units, and the loans distributed to their customers is just Rp2.53 trillion. This means that only 6.7% of MSEs have the chance to access microcredit. Based on the observation of Kantor Mennegkop and MSEs, there is a need for at least 8,000 new microcredit institutions (MCIs) to serve MSEs in Indonesia (Budiantoro 2003).

Structure and concept of microcredit

Credit or financial systems include many institutions, instruments and markets. They consist of formal, semi-informal and informal financial arrangements and institutions.

- *Formal* financial institutions include commercial banks, development banks, specialised savings banks, postal savings systems, cooperative banks, and unit and regional rural banks.

- *Semi-formal* financial systems comprise farmers' associations, credit cooperatives, credit unions, village banks, self-help groups, integrated rural development programs and non-government organisation (NGO) financial programs.
- *Informal* finance includes communal and savings clubs, mutual aid societies, rotating savings and credit associations, input suppliers, storekeepers, trader/farmer/agent lenders, moneylenders, and friends and relatives.

Besides structure, some key concepts of rural or microcredit are viability, self-reliance, sustainability, outreach and impact.

- Viability means that it covers costs.
- Self-reliance means that it mobilises its own resources.
- Sustainability means that it preserves the value of resources.
- Outreach means that it broadens services for the poor.
- Impact means that it helps the poor help themselves (Seibel 2001).

There are three key elements of MCIs:

- They provide various financial services relevant to the real needs of the community.
- They serve community groups that have low income (i.e. poor people become the main beneficiaries).
- They use procedures that are contextual and flexible so that they are easily reached by poor people who need the service.

Various factors have resulted in MCIs becoming an option for low income people, largely because they are responsive to grassroots activities using simple procedures not complicated by regulations. Also, MCIs support the sustainability and development of micro and small enterprises that are proven to be the basis of the Indonesian economy (Sumodiningrat 2003).

Provider and target of microfinance

In 2000 a movement to empower microcredit was established. The movement comprised microcredit stakeholders, i.e. government, finance institutions, NGOs, private sector, academic researchers, community organisations and funding institutions. They made a commitment to empower microcredit institutions throughout the country, and targeted 10 million poor families in 2005. Through various efforts, in 2004 this movement nearly reached the target by

giving financial services to more than 9 million poor families, as shown in Table 2.

It can be seen from the table that even this effort lags well behind demand. Ismawan and Budiantoro (2005) estimate that less than 25% of MSEs can be served through MCIs.

Constraints of microcredit institutions

Budiantoro (2005) has identified some major constraints faced by MCIs in Indonesia. They are unclear government policies, the need for microfinance wholesalers and poor capacity building.

There is still no clear policy regarding the issue of microcredit. Most practitioners are uncertain where microcredit is positioned in national financial systems. There are no clear directions that can be used by stakeholders to develop microcredit. The development of microcredit so far has been influenced and shaped by different, often competing or even conflicting, policies for poverty alleviation, subsidised credit and financial sector development. For example, there are 70 projects of government institutions that have a microcredit component. They are primarily supported by donors, with a budget of almost US\$300 million, but, as many of them do not follow microcredit best practices, they may not be sustainable. These projects may even impede progress for MCIs developing commercial and professional approaches.

The need for wholesalers of microcredit is related to the problem of lack of capital. The process of lending from MCIs to MSEs may go past ‘the point of

no return’. After receiving credit, MSEs can expand and will require more and more credit. Capital is the most significant problem of MSEs. If they do not get more credits from MCIs, they will be reluctant to pay the instalments as they need the money for running their businesses. Credit for MSEs is mostly without collateral, so it is difficult to force them to repay. This situation is unsustainable in the absence of regulations to govern MCIs and greater financial responsibility by MSEs.

According to Indonesian law, banks are the only institutions allowed to mobilise saving from the public. This means that MCIs in Indonesia needs to be supported by sufficient capital to avoid problems. Moreover, without microfinance regulations, MCIs run by NGOs are not legal entities, which makes it difficult for them to cooperate with other (financial) institutions to access capital. To solve the problem of lack of capital, some countries have microcredit wholesalers or a ‘central bank alternative’ for the poor. Most MCIs agree they need such institutions. While this may address the supply of capital, MCIs need to ensure that MSE borrowers understand their responsibility to maintain loan repayment. This requires capacity building within the MSEs and the MCIs in regard to financial management.

Capacity building within MCIs is required since skills are required to run financial services. There seems to be enthusiasm among the NGOs in Indonesia to establish MCIs as they want to serve the poor by providing a sustainable means to alleviate poverty. They do not want to depend on donors in the long term so they offer microcredit. However, transforming NGOs to professional MCIs needs a para-

Table 2. Microfinance in Indonesia

No.	Institution	Unit	Creditor	Credit (million Rp)	Saver	Saving (million Rp)
1	BPR	2,148	2,400,000	9,431,000	5,610,000	9,254,000
2	BRI Unit	3,916	3,100,000	14,182,000	29,870,000	27,429,000
3	Badan Kredit Desa	5,345	400,000	197	480,000	380
4	KSP	1,097	665,000	531,000	na	85,000
5	USP	35,218	na	3,629,000	na	1,157,000
6	LDKP	2,272	1,300,000	358,000	na	334,000
7	Pegadaian	264	16,867	157,697	No savers	No savings
8	BMT	3,038	1,200,000	157,000	na	209,000
9	Credit union and NGO	1,146	397,401	505,729	293,648	188,015
	TOTAL	54,444	9,479,268	28,951,624	36,253,648	38,656,395

Data compiled by Gema PKM, analysed by Ismawan and Budiantoro (2005)
n.a.: data not available

digm and cultural shift. To run a credit institution requires discipline and a prudent attitude or the institution will most likely lose money. The capacity to retail microcredit in Indonesia through NGO–MCIs remains low. The absence of quality training at reasonable prices for MCI staff to learn capabilities in microcredit is a major reason why NGOs still lack the capability to run financial services for the poor (Budiantoro 2005).

The need for a government role

To serve the poor with financial services in an effective and sustainable way, financial reform is urgently needed. There is need for a national policy of microcredit within a legal and regulatory framework. Without a legal basis, MCIs work in a grey area between legal and extralegal and could even be accused of illegal banking.

Governments and the central bank play a critical role in enabling institutions, markets and instruments to flourish by creating various elements of a complex framework. There is consensus that a conducive policy environment is a prerequisite for the development of viable and sound credit institutions to service the huge demand of the ‘unbanked’ market. Of particular importance are:

- macroeconomic stability
- deregulated interest rates, exchange rates and commodity prices
- a legal system that protects property and land-use rights, the autonomy of credit institutions and regulatory authorities, functioning prudential regulation and due legal process.

In addition, institutional support mechanisms are required in fields such as training and consultancy, technical support and deposit protection. A conducive framework would also imply a legal framework directed towards protecting the interests of small depositors, thus supporting soundness of deposit-taking financial institutions and reducing the systemic risk in the financial market. Prudential regulation is essential for stabilising and developing the financial sector. A microfinance regulatory framework should focus strictly on prudential issues in order to keep roles and responsibilities of authorities clearly defined and to smooth implementation. In particular, despite some policy makers suggesting this, the regulatory framework should not address monetary policy issues such as interest rate policies or minimum reserve requirements.

As a general principle, the regulatory framework should be flexible enough to permit non-licensed microfinance institutions to evolve. These institutions, although refraining from mobilising deposits from the public, have the potential to test innovative technologies, to regulate and to maintain outreach to rural areas and the poor. The coexistence of regulated and non-regulated financial institutions can be supported by adopting a tiered approach. This approach is conducive to the development of strong microfinance institutions (MFIs) that mobilise deposits from the public without constraining the large number of small institutions that can continue to operate as credit-only institutions financed by donor agencies or by their members. It also permits commercial banks to offer microfinance services without submitting their microfinance portfolios to inappropriate regulations (Jansen et al. 2004).

Strategy framework for microcredit development

The strategy framework for building rural credit is three pronged: (i) creating the policy environment; (ii) building financial infrastructure; and (iii) institutional development. Governments and donors need to evaluate these three areas as they set priorities for interventions and investments. The key objective of the financial system was once narrowly defined as providing financial services at prices that reflect their cost. In recent years the emphasis has broadened, especially for microfinance, to take into account the dual objectives of outreach and sustainability. When scarcity of a public resource is considered, outreach involves more than just the number of clients served. Generally speaking, a financial system meets more of society’s objectives and merits the allocation of more scarce resources if it:

- serves many clients
- serves many poor clients
- provides a large range of services
- costs users as little as possible
- provides services over a long period of time
- can be sustained with only minimum support from non-users or taxpayers.

These should be the objectives of the policies and programs for rural financial markets.

Historically, governments have intervened in financial markets by controlling the means of payment to guarantee soundness. More recently, they have attempted to influence credit allocation. Their

primary concern has been to ensure prudent behaviour by banks. The impact of bank failure can be especially severe in developing countries since there are few alternative sources of finance for both firms and households. Financial crises can occur when regulation fails, as happened recently in Asia. Depositors lose confidence in the banking system in such circumstances, so governments may have to introduce deposit insurance and lender-of-last-resort facilities and bail out failed institutions to prevent bank runs, reduce depositor losses and restore confidence. Owing to a lack of confidence in banks during the crisis that began in 1997, many Indonesians shifted deposits to state and foreign banks (Krisnamurti 2005).

Governments influence growth in money supply and interest rates as part of overall macroeconomic management. Prudential regulation and supervision procedures are implemented to prevent fraud and excessive risk taking by financial institutions. These include minimum capital requirements, auditing and reporting requirements, and portfolio restrictions. The difficult task of regulation is one of balancing efficiency and innovation that requires, at the same time, freedom to act and stability. A recent concern is the potential moral hazard if banks are not allowed to fail. If bank owners and managers are not required to pay for their mistakes, they may be induced to undertake risky investments in the future knowing that the government or an international agency will cover their losses.

Government policy framework and stakeholders

It is expected that the basic policy framework of government will be based on the following strategies:

- providing policies for microcredit oriented to people's needs and offering incentives for increased public and private sector involvement in the microfinance market
- avoiding distortions due to credit subsidies and unsustainable high costs that have in the past failed to serve end users, weakened existing microfinance mechanisms and burdened the government with an even bigger financial burden, discriminating between credit policy and social welfare policy (Social welfare does not necessarily involve subsidised credit, soft loans and the like any more. Credit requests from poor families and

microentrepreneurs are provided through various MFIs with innovative financial products. The role of government in this case is to build the capacity of MFIs and implement supervision as well as regulation of microfinance market so that it functions well.)

- supporting the development of institutional frameworks for microfinance in Indonesia to include various stakeholders as follows:
 - *microfinance institutions (MFIs)*—directly give various forms of microfinance services based on what poor families and micro-entrepreneurs require
 - *microfinance council*—develop microfinance policies that are market oriented and can promote microfinance efficiently and support MFIs in enlarging their microfinance services
 - *commercial banks and other microfinance institutes*—provide wholesale funds and other financial services
 - *government*—supervise MFIs that have sufficient customers to operate professionally, have level playing fields, and facilitate the development of wholesaler institutions and other supporting institutions
 - *NGOs*—provide technical assistance for poor families and microentrepreneurs to deal with MFIs and promote their services as well as to help build their capacity
 - *donors*—provide various support either to MFIs, NGOs, commercial banks and government so that they perform their roles optimally.

The government might be expected to perform the following strategic steps based on these policy frameworks in order to provide access to finance for poor families and micro-entrepreneurs (Krisnamurti 2005):

- develop a conducive policy environment for the financial market to function efficiently and effectively by reforming financial policy to eradicate distortion
- rationalise various programs and projects with microfinance components so they are sustainable and market-oriented
- realise a microfinance policy environment that is oriented to emphasise product type and service, technology design and implementation, and new microfinance practices aimed to provide intermediary services between MFIs and poor families or microentrepreneurs. These services are

performed through policy regulation that protects the existence and operation of MFIs, as well as developing innovative solutions based on need

- develop professional performance and business practice for MFIs
- promote various technologies and innovations
- implement programs of capacity building for MFIs through provision of technical assistance specifically aimed at:
 - savings mobilisation
 - financial management and project management
 - empowerment of information technology
 - technology development for microfinance
- encourage various policy studies and discussions focusing on new capacity-building initiatives for MFIs and to develop extensive consciousness of the strategic potentials of MFIs
- facilitate the development of supporting institutions for microfinance through:
 - providing financial and technical support to wholesaler institutions that can be accessed by MFIs
 - giving technical assistance for the establishment of rating institutions in cooperation with microfinance wholesalers and investors
 - developing support for establishment of education and training institutions for microfinance.

Closing comments

The growth and development of micro and small enterprises in Indonesia is a consequence of domestic economic experiences and the liberalised market. Establishment and enhancement of microcredit institutions is urgent. In developing countries such as Indonesia, and specifically in areas such as East Nusa Tenggara, the government needs to play a role in empowering MCIs through implementing conducive

regulation without excluding fair and relatively free competition. The government and stakeholders have shown their commitment through allocating various and many financial or credit programs to MSEs. This is beneficial to the welfare of the people but it is essential for sustainability of these programs and optimisation of the benefits of microcredit programs that local government, in consultation with stakeholders, develop and implement regulations that strengthen and enhance the number and performance of MCIs.

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Microfinance for developing poor communities in East Nusa Tenggara: problems and solutions from the perspective of a non-government organisation

S.M. Rozali¹

Abstract

The paper describes the experiences of Tanaoba Lais Manekat (TLM), a non-government organisation, that is successfully involved in delivering microfinance services as part of a broader program aimed at assisting poor people and business in East Nusa Tenggara, especially Timur Barat. TLM's microfinance services program currently focuses on four components: (i) small group lending; (ii) individual lending; (iii) cattle fattening; and (iv) seaweed cultivation. As well as offering financial services, TLM provides targeted financial and business development training and support. Given this supportive business model, TLM's microfinance program has grown dramatically since 1994 to include around 17,000 active clients at the end of 2005.

Microfinance bagi pembangunan masyarakat miskin di Nusa Tenggara Timur: masalah dan solusinya dalam pandangan lembaga non-pemerintah

S.M. Rozali¹

Abstrak

Makalah ini menjelaskan tentang pengalaman Tanaoba Lais Manekat, yaitu sebuah Lembaga Swadaya Masyarakat, yang telah berhasil memberikan pelayanan dalam microfinance sebagai bagian dari program yang lebih luas yang bertujuan untuk membantu masyarakat miskin dan pengusaha di NTT, khususnya Timur Barat. Program pelayanan microfinance TLM saat ini berfokus pada empat komponen: (1) pinjaman kelompok kecil, (2) pinjaman perorangan, (3) penggemukan sapi, (4) pemeliharaan rumput laut. Disamping itu TLM juga menawarkan pelayanan keuangan, yang dalam hal ini diberikan pada pembangunan keuangan dan usaha di bidang pelatihan. Dengan model usaha seperti ini, program microfinance TLM berkembang pesat sejak tahun 1994 yang termasuk didalamnya 17,000 anggota aktif terhitung sampai dengan tahun 2005.

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Introduction

East Nusa Tenggara (NTT) in Indonesia is categorised as a province with a high level of poverty. Household income in 2004 was approximately Rp3 million, less than one-third of the national household income of Rp9.5 million. Poverty is also indicated by the level and quality of human life that is, on average, lower than in Indonesia in general. Statistically, the number of people in NTT who are living below the poverty line is about 27%, almost twice the national level (15%). Population density is low and the majority of people are living in rural areas. Almost no industry operates in NTT.

Various strategic programs have been developed and implemented by government as well as non-government organisations (NGOs) to overcome the poverty issue. One of them is the provision of microfinance services (MFS), which is often limited only to the provision of microcredit. But microfinance services can be much broader in scope than just microcredit; they are believed to be a key strategy for helping communities out of poverty.

In Indonesia some microfinance providers are considered to be successful in overcoming or at least reducing poverty, among them Bank Rakyat Indonesia (BRI) Unit Desa (Robinson 2002), microcredit provided by Proyek Peningkatan Pendapatan Petani Nelayan Kecil (P4K), as well as microfinance services by Purba Bank in Semarang and Mitra Karya in East Java (Seibel and Parhusip 1997). While microfinance services have succeeded in reducing poverty in some places in various countries as found in a number of studies, some studies have documented the limitations of microfinance's capacity to alleviate poverty, especially for the poorest. The formats or designs of MFS and local conditions contribute significantly to the success of programs in dealing with poverty.

This paper discusses problems and solutions related to helping poor communities in Indonesia, especially in NTT, through microfinance services. It also presents an example or model of MFS implemented by an NGO, namely the Tanaoba Lais Manekat Foundation (TLM).

Microfinance services

Definition of microfinance

Microfinance is interpreted as the supply of various kinds of financial services including credit, savings, insurance and money transfer services for poor people, poor families or low income communities and their microbusinesses (Usman et al. 2004). This definition allows a wider scope for microfinance than just the provision of microcredit, and also focuses on poor or low income communities. There are two main features of microfinance that differentiate it from formal financial services: size of loan and/or savings, and lack of collateral.

Microfinance institutions in NTT

There are various microfinance services institutions (MFI) in NTT, including formal bank and non-bank institutions, non-formal institutions, government programs and informal institutions. The SMERU Research Institution (2004) divides MFIs that operate in NTT into four groups as follows:

- *Formal institutions* are legally structured institutions that are formally acknowledged by the prevailing legislation as financial institutions. These formal institutions are divided into two types: bank (e.g. BRI, Bank Mandiri, BPR) and non-bank (Village Unit Cooperative, credit cooperative, pawnshop service).
- *Non-formal institutions* are legally structured institutions, such as foundations or other structures formed by the approval of the Governor or Head of District that do not have permission and acknowledgment as formal financial institutions by the prevailing legislation. Examples include Usaha Simpan Pinjam (USP) and Lembaga Swadaya Masyarakat (LSM).
- *Government programs* that provide or contain microfinance components generally in the form of credit and microcredit programs. Included in this category are Kredit Pemberdayaan Ekonomi Masyarakat (PEM) and Bantuan Pinjaman Langsung Masyarakat (BPLM).
- *Informal institutions* are those that have no legal structure, such as artisan groups, church groups or other informal groups.

Problems and challenges in providing microfinance services in East Nusa Tenggara

There are many institutions, government or non-government, formal or non-formal, involved in providing MFS through a number of different programs and activities and their programs are continually developing. However, not all the programs have been able to help poor communities in addressing their economic issues. Problems apparently come from the program design and policy, size of credit and accessibility as described below:

- MFS provided by formal institutions, particularly banks, cannot be fully accessed by all poor communities. Collateral and business feasibility determined by the bank are the determining factors. Poor communities that consist predominantly of farmers generally do not have the types of collateral required by the formal institutions (household assets, land ownership certificate etc.).
- MFS in Indonesia, particularly in NTT, are still dominated by the provision of credit only, and very few institutions give attention to the other financial services needed by the poor such as savings and insurance.
- Size of credit needed by poor communities is generally small, so is not accommodated in credit schemes offered by the majority of banks.
- MFS are mainly linked to providing additional business capital but often the reason that poor people request loans is not to increase capital but is an effort to address non-business expenses.
- MFS institutions are generally located in cities and major districts and subdistricts and are therefore difficult to access by poor remote communities.
- Poor communities who have difficulty accessing services from formal and non-formal institutions often borrow from loan sharks and get trapped into very high interest loans.

Microfinance programs and implementation by NGOs in NTT: experiences of TLM

There is very little information available about the MFS provided by Lembaga Swadaya Masyarakat (LSM) in NTT; therefore, empirical experience of TLM in providing microfinance services is relied on here. The vision and mission of the TLM – GMIT

Foundation have certainly become the inspiration, spirit and basis of design and management of its MFS programs. The vision of TLM is to show God's love to the world. Its mission is to improve the lives of poor communities in NTT via economic, social and spiritual transformation.

The TLM Foundation was established in November 1994 and currently has a Head Office located in Kupang City and 10 Branch Offices distributed in Kupang City (one office), Kupang District (four), and one office in each of TTS district (Soe), TTU (Kefa) and Alor (Kalabahi). Additionally, there are two Service Posts: the Seaweed Service Post in Rote (Nembrala) and the Cattle Fattening Service Post in Baun. TLM is managed by 158 staff comprising 71 administration and 87 field staff.

Scope of microfinance services and client target of Yayasan Tanaoba Lais Manekat

MFS are one of TLM's five main programs, the four other programs being Training, Business Developments Service, Community Development, and Spiritual Development. TLM's MFS program is integrated into four microlending programs: (i) the small group lending program (KUM); (ii) the individual lending program; (iii) the cattle fattening program; and (iv) the seaweed cultivation program.

The target of these services is small traders, poor farmers and low income employees. The number of active loan clients has been increasing year by year; at the end of December 2005 TLM had 16,849 active clients. The majority are in the KUM program (67.8%), followed consecutively by the individual lending program (21%), the cattle fattening program (7.5%) and the seaweed program (3.7%) (Table 1). Client numbers are projected to increase to 35,000 by the end of 2007.

Small-group lending program (KUM)

This program is known as KUM (*Kelompok Usaha Mandiri*). The program is aimed at small traders, poor farmers and low-income employees who run businesses and earn income on a daily basis. These people need capital to develop their businesses but have no opportunities to borrow from banks because of the unavailability of collateral. To take part in this program, potential clients must meet certain criteria and requirements determined by TLM such as type of business, amount of existing capital, age, place of residence and integrity.

Table 1. Number of active clients (people) in TLM’s microfinance programs, 2002–05

No.	Program	2002	2003	2004	2005
1	KUM	5,385	7,250	11,605	11,425
2	Individual	–	–	1,775	3,539
3	Cattle	28	146	720	1,254
4	Seaweed	–	55	623	631
	Total	5,413	7,451	14,723	16,849

Note: – = program not yet implemented

KUM groups each consist of five members and each member must have existing business capital of less than Rp2,000,000. The loan has six cycles, beginning at Rp500,000 and ranging up to Rp5,000,000 at the sixth cycle. Interest charged is 3% per month with a 20-week (5-month) repayment period. The basis of loans disbursed to clients is *trust*. The organisation trusts that each member will be able to repay loans fully as agreed together. TLM makes sure that all clients understand the importance of their loans and that the loans can be easily repaid if they are correctly managed. Conversely, clients understand that poorly managed loans will cause business problems.

In every loan, each member is obligated to save repayment money every day so that at the end of each week the clients can repay the full amount owing. To discipline clients in managing income and spending money wisely, TLM provides each member with a locked wooden safety box. Loan repayments are collected by field officers when groups meet every week. Field officers also have the task of motivating members and training them.

Individual lending program

This program includes people who have graduated from the KUM program and new clients, both men and women, whose businesses have experienced better development compared with clients in the KUM program. The target of this program is small traders and low level employees who run businesses to earn additional income on a daily basis, and require capital to develop their businesses but have no opportunity to borrow money from banks. Because clients involved in this program are those whose businesses are relatively larger, their business capital needs are also higher—Rp2,000,000 minimum. The loan interest rate is 3% per month with a repayment period from 12 to 24 months. For every loan, TLM charges a 3% administration fee. Repayments are made by clients directly to the nearest TLM branch office.

Cattle-fattening program

NTT is renowned as a beef cattle producer in Indonesia. Among all large livestock that are cared for by the community, the cattle population is the biggest, followed by water buffalo and horses. Most of the cattle (77%) are cared for on Timor Island (Table 2). The majority of cattle farmers are also agricultural farmers and livestock makes a significant contribution to the income of communities and local economies. An analysis of Produk Domestik Regional Bruto (PDRB), NTT, in 2004 shows that livestock (especially cattle) and its derivatives are very important for NTT communities. Of the total contribution from the agriculture sector to the PDRB, NTT, livestock makes up about 30%. Though this figure is lower than the contribution from food crops (51%), it is still higher than other subsectors in the areas of agriculture/fishery and far higher than many businesses in non-agriculture sectors (Biro Pusat Statistik 2005).

Implementation of the cattle-fattening program (the majority are Bali cattle) is concentrated on Timor Island, particularly the Kupang district. Twenty-six per cent of cattle are in the Kupang regency (Table 2) and a cattle-fattening culture known locally by the term ‘*paron*’ has been practised in this area for a long time, especially in the Amarasi subdistrict.

The fattening program developed by TLM is a group-lending program for groups with between 15 and 20 members. Loan size depends on market prices at the time. Loans are in the form of cattle, not cash, to avoid deviations in the usage of the loan. The loan term is 6 months, coinciding with the cattle fattening period. Each client is charged 3% interest from the initial cattle-buying price. Profits that clients and TLM receive are based on profit sharing, comprising 60% to the client, 30% to TLM and 10% to the local church where the group resides.

Clients are actively involved in the process of buying as well as selling cattle to ensure transparency.

Determination of the fattened cow's selling price is done by actually weighing the cattle, not by guessing the body weight, as has been practised generally in the fattening business and which has very often been the cause of losses to cattle farmers. TLM actively participates at the selling stage by identifying and selecting potential buyers to get the best price. Besides that, TLM, through their field officers, also provide training and guidance during the fattening period.

In recent times TLM has begun to obtain a number of cattle for its cattle-fattening program from its cattle service post in Baun. Cattle that are bought from local cattle markets are generally in a stressed condition. Prior to disbursement, TLM holds these cattle for 1–2 weeks at the post for recovery treatment and weighing. Treatment includes vitamin injections, worm medicine and vaccinations, so when cattle disbursement takes place, all cattle are healthy and in good condition. Known initial body weights allow productivity during the fattening period to be predicted.

At present, besides implementing the cattle-fattening program, TLM is also piloting a cattle-breeding program. This program includes the purchase of productive pregnant female cattle to be cared for by clients. Calves are given to the client to be raised and used in the cattle-fattening program or for cattle breeding. Insemination is also undertaken using a Brangus bull. This initiative will address the issue of cattle availability and quality for fattening

(sapi bakalan) and hopefully will reduce the current high rate of slaughtering of productive females that threatens sustainable cattle production in NTT, especially in Timor.

Seaweed cultivation program

This program is aimed at communities living in coastal areas with potential to cultivate seaweed but with no access to capital from banks or other financial institutions. Size of loans is based on need, requests and analysis and is between Rp250,000 and Rp1,000,000. The loan repayment period is 20 weeks and is repaid fortnightly (10 repayments per loan). Interest rate charged is 3% per month or 1.5% per 2 weeks. TLM actively supports the marketing of harvested seaweed and provides training and guidance to improve skills and quality of production.

Disbursement performance of TLM's microfinance program

TLM's loan disbursement increased by 122% between 2003 and 2004 (Table 3). Disbursement continued to increase in 2005 at 17%. In 2005 the KUM and seaweed programs were the most popular, as shown by their shares of the total loan disbursement (51% and 32% respectively), followed by the individual and cattle programs. Over the period from 2002 to 2005 KUM has received almost 51% of the total loan disbursements. Since their establishment the individual and cattle programs have grown significantly.

Table 2. Livestock population (number) per district/city NTT province, 2004

No.	Regency/city	Cattle	Buffalo	Horse
1	West Sumba	6,234	32,759	16,852
2	East Sumba	40,325	33,603	27,577
3	Kupang Regency	133,920	7,051	11,762
4	South Central Timor	116,169	515	4,706
5	North Central Timor	57,003	706	2,278
6	Belu	92,586	2,513	3,730
7	Alor	1,243	–	143
8	Lembata	1,381	5	1,511
9	East Flores	1,528	33	2,471
10	Sikka	4,711	495	3,185
11	Ende	6,517	2,515	2,547
12	Ngada	33,505	11,923	8,097
13	Manggarai	8,076	15,001	6,058
14	Rote Ndao	14,191	10,084	4,290
15	West Manggarai	2,149	19,742	1,160
16	Kupang City	3,301	33	49
	Total NTT province	522,929	136,968	96,416

Table 3. Loan portfolio (in rupiah) TLM, 2002–05

No.	Program	2002	2003	2004	2005
	Loan outstanding				
1	KUM	1,712,793,375	1,653,619,272	2,689,871,984	2,601,879,288
2	Individual	–	–	2,712,248,025	4,656,543,348
3	Cattle	44,238,500	145,920,531	1,229,735,868	2,310,638,233
4	Seaweed	–	–	2,712,248,025	4,656,543,348
	Total	1,757,031,875	1,818,564,334	6,871,618,235	9,837,134,371
	Loan disbursement				
1	KUM	4,783,440,650	8,062,788,600	12,237,500,290	10,922,364,205
2	Individual	42,950,000	229,950,000	1,844,683,499	3,369,465,000
3	Cattle	–	19,766,250	395,835,000	356,250,000
4	Seaweed	–	–	3,922,585,000	6,852,175,242
	Total	5,927,450,000	8,311,504,850	18,440,603,789	21,500,254,477

Note: – = program not yet implemented

The strong growth in the individual program indicates successful improvements that former KUM clients have made in their businesses, enabling them to continue to borrow and increase the size of loans. In 2005 the seaweed loan was the second highest, growing by 75% since 2004.

Conclusion

The following are some conclusions that can be drawn from the observations above:

- Microfinancial services can be a key strategy in reducing poverty.
- Management of microfinance programs should be done comprehensively, not only focused on microcredit but also covering other economic needs such as savings and insurance, and provide training for the community.
- Microfinance programs will make maximum contribution to alleviating poverty if they are designed and managed to align with the local

economic activities of the poor. These economic activities are small and highly sensitive to the fluctuations of broader economic factors.

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Evaluation of non-timber forest product species as potential elements of agroforestry systems

A.B. Cunningham, S.T. Garnett and N. Stacey¹

Abstract

Eastern Indonesia's high biological and cultural diversity is reflected in diverse and dynamic agroforestry systems. Systematic evaluation of non-timber forest products produced from agroforestry systems can identify those that could generate returns to help lift rural families out of poverty. What are the characteristics of 'winning products'? Which of these can be linked to Fairtrade or certification to reach selected markets? These are important questions at a time when farm income is in decline in West Timor and in East Nusa Tenggara (NTT) generally for a variety of reasons, including technological change, low commodity prices and globalisation.

Although farm income is in decline, agriculture and agroforestry are still the main sources of total household income for rural households, followed by income from marine resources. On drier islands, agriculture contributes a much smaller component of household income. Two off-farm sources are crucial to many households: first, income from the processing and sale of non-timber forest products (such as from palm species, *kutu lak* and woven textiles); and second, remittances from emigrants commonly working in Malaysia and the Middle East (particularly Saudi Arabia). The income share from handicrafts is higher on drier islands such as West Timor, Sumba, Lembata and Rote.

Commercial trade in the higher value non-timber forest products in NTT, such as sandalwood and *gaharu* (*Aquilaria* resin), has a very long history, often characterised by overexploitation of wild populations and market control by well-connected traders. In some cases species have been added to agroforestry systems for social, economic and cultural reasons. Selecting 'winning' species for agroforestry systems in West Timor should be based not only on economic values, but also on cultural and social context including land tenure, prospects for local value-adding, market security and lessons from the past.

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Evaluasi terhadap species produksi hutan non-kayu sebagai elemen berpotensi dari sistem wanatani

A.B. Cunningham, S.T. Garnett dan N. Stacey^{1a}

Abstrak

Tingginya biologis dan keragaman budaya di Indonesia Timur tercermin pada keragaman sistem wanatani yang dinamis. Sistematika evaluasi terhadap produk hutan non-kayu yang dapat diproduksi dengan sistem wanatani sangatlah penting untuk diidentifikasi dimana hal tersebut akan dapat memberikan pendapatan yang bisa mengangkat keluarga pedesaan keluar dari kemiskinan. Apa saja karakteristik dari pada 'winning products'? Yang manakah yang dapat dikaitkan pada Fairtrade atau sertifikasi dalam mencapai pasar yang dipilih? Pertanyaan-pertanyaan tersebut sangatlah penting dikala pendapatan pertanian mengalami kemunduran tidak hanya di Timor barat tapi juga di Nusa Tenggara Timur (NTT), untuk berbagai alasan, termasuk perubahan teknologi, harga komoditi rendah dan globalisasi.

Meskipun pendapatan pertanian mengalami kemunduran, pendapatan dari agraria dan wanatani masih merupakan sumber utama bagi kepala rumah tangga di pedesaan, disusul dengan pendapatan dari penangkapan sumber laut. Pada pulau yang lebih kering, agraria merupakan komponen yang lebih kecil kontribusinya dalam pendapatan kepala rumah tangga. Dua sumber diluar pertanian yang penting bagi banyak kepala rumah tangga. Pertama, pendapatan dari memproses dan menjual produk hutan non-kayu (seperti hasil dari berbagai jenis palem, kutulak dan kain tenun) dan yang kedua, penghasilan dari perburuhan diluar negeri untuk pria biasanya bekerja di Malaysia, Timur Tengah (khususnya Saudi Arabia). Pendapatan dari kerajinan tangan proporsinya lebih tinggi di kepulauan yang lebih kering, seperti Timor Barat, Sumba, Lembata dan Rote.

Perdagangan komersil pada produk hutan non-kayu nilai tinggi di NTT, seperti cendana dan *Agularia* resin (gaharu) memiliki sejarah panjang, sering berkarakter akibat eksploitasi berlebih pada populasi liar dan kontrol pasar oleh jaringan pedagang. Pada beberapa kasus, species telah ditambahkan pada sistem wanatani, untuk alasan sosial, ekonomi dan budaya. Memilih 'winning' species untuk sistem wanatani di Timor barat tidak perlu berdasar pada nilai ekonomi saja, tetapi juga pada budaya dan konteks sosial, kuatnya hak kepemilikan, berkembang pada kemungkinan tambahan nilai lokal, keamanan pasar dan pelajaran dari pengalaman masa lalu.

Introduction

East Nusa Tenggara (NTT) is one of the poorest provinces in Indonesia. Five hundred and fifty islands, dominated by Flores, Sumba and West Timor, support just over four million people, of whom about three-quarters rely on subsistence agri-

culture. Literacy rates are low, with a secondary school enrolment rate of 39%, while child malnutrition (32%) and child mortality (71 per 1,000) are higher than in most of the rest of Indonesia (Anon 2006). Declining on-farm productivity, as well as declining catches from the next most important sector, marine resources, have also resulted in high levels of labour migration, mainly to Malaysia and the Middle East (particularly Saudi Arabia). Between 30,000 and 100,000 workers travel annually from NTT (Hugo 2005). There is an urgent need to find

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alternative ways in which NTT farmers can supplement their incomes.

One way by which this can be achieved is through an increase in production of non-timber forest products (NTFPs), especially where this can be combined with forestry or agroforestry to reduce impacts on the remaining natural forests. This offers potential not only to increase household income to real subsistence levels that will reduce malnutrition and increase health but also, through trade, to allow a transition out of poverty.

Commercial trade in the higher value products has a very long history in NTT. The name Nusa Cendana, an earlier name for the islands, was derived from the sandalwood that has been traded from the region since the 10th century and which contributed to colonisation by western powers in the 16th century (Rohadi et al. 2000). However, overexploitation of wild populations of this and other NTFPs has led to a rapid decline in productivity in recent decades. Also, markets are often controlled by well-connected traders who reduce returns to local farmers from whose land the products are harvested. Nevertheless, sandalwood is only one of many NTFPs being traded; farmers are frequently adding new species to agroforestry systems as they identify opportunities. This paper proposes guidelines by which such new products can be identified, and discusses some examples of specific interest to NTT.

Winning products

'Winning products' have a range of characteristics most likely to provide a return to smallholders. Assuming it has been established that there is a market for the product, the following 10 characteristics are important.

Uniqueness

Products found nowhere else in the world are going to have a competitive advantage. These can be products of natural species or varieties that are endemic to an area, or transformed products that are found nowhere else. In a mobile world, however, uniqueness is often transitory until species are exported to be grown elsewhere or products and processes are copied at sites where they can be produced more cheaply. In fact there is considerable pressure through the World Trade Organization to allow free flow of products and ideas as this is believed to drive wealth creation in the

global economy. On the other hand, there are increasingly stringent provisions to ensure that benefits from biodiversity are retained in, or at least partially returned to, the country of origin. There are also international agreements to ensure that intellectual property contained within local production systems can be protected.

Opportunity for certification or cultural branding

A distinctiveness is most likely to be maintained in products that can be registered easily through groups like Fairtrade, based in the United Kingdom, or that receive some other form of certification such as 'organic' or 'not made by children'. While this does not necessarily secure a market, it can mean that a premium price is received for the products on the basis that they have guaranteed values (Walter 2002).

Ingredients for sustainable harvest

Too often NTFPs have been exploited to commercial extinction. While innovations may find suitable substitutes and NTFPs can be domesticated and integrated into agroforestry systems, there will be short-term consequences for those whose livelihoods depend on access to natural forests. There should be a market advantage for production that is sustainably grown and harvested. Sustainability is necessary at every stage of the food chain. For example, the use of artificial dyes that cause health problems and can pollute waterways are just as unsustainable as over-harvesting of natural dye plants.

Niche markets

Unique products rarely have mass markets. Usually, markets for such products are specific to demographic sectors, either locally or internationally. Knowledge of the requirements of these markets can be used to develop marketing strategies. Buyers can also be educated to discern differences in production, quality and benefit distribution such that premium prices can be gained, thus providing good returns to producers.

Sufficient volume and reliability of supply

While markets for a winning NTFP are likely to be small, they must nevertheless be large enough to justify expenditure on market development. Supply to the market must also be sufficiently reliable for the

market to stay engaged with the product. Planning development of such a product does not necessarily mean that production needs to be from a single source. In fact it can be better to spread risk by meeting market demand from multiple suppliers or sites so that temporary declines in production, such as might result from climate or political fluctuation, cause minimal disruption to supply.

Consistently high quality

To receive a high price, quality control is essential. Variable quality can lead not only to lower prices for some goods but also introduce extra handling costs associated with quality assessment at points along the supply train. The greater the consistency of quality the lower these assessment costs, the more reliable the return to producers and the greater the incentive to produce and to purchase.

High price/volume

A common cause of rural poverty is poor access to markets for smallholders. Often there is limited capacity and inadequate infrastructure to move large volumes of goods to markets. High product turnover is one basis of wealth creation but is unlikely to be an option for many producers. A winning product usually has a high value per given weight or volume, thus minimising transport and handling costs and maximising returns. This is often achieved by processing the raw material near its source to reduce product bulk.

Long shelf life and physical sturdiness

While storage processes are rapidly improving and time to market is being reduced, stable and durable products that do not deteriorate with age are more likely to be successful than those that decline rapidly in quality or need special conditions to maintain quality. Product sturdiness can also be a consideration where transport infrastructure is poorly developed. Protection of fragile products, such as shells or delicate carving, can add substantially to costs, just as refrigeration adds cost to perishable goods.

Potential for local value-addition

Raw products fetch only a small proportion of the price of transformed goods. Winning products can be processed locally into high-value goods that meet other criteria. Primary produce seldom has qualities that warrant raw export and the choice of NTFPs that

might be incorporated into agroforestry must consider the extent to which such transformation can take place close to the source of supply and at relatively low cost.

Limited policy ‘bottlenecks’

The harvesting of some products is strictly controlled by social and policy processes in a manner that limits returns to local producers. For example, ownership of all sandalwood in NTT was traditionally claimed by local rulers. They gifted only the branches to those who harvested the wood, even if the trees were growing on the harvesters’ land. This arrangement was maintained after Indonesian independence, with ownership being transferred to the national government, with the result that prices need to be high to warrant local production by smallholders (Rohadi et al. 2000). Taxes and local, national and international regulations and policies can also inhibit economic development of particular products. For instance, the trade in species listed under the Convention on International Trade in Endangered Species of Wild Fauna and Flora needs to be highly profitable to enable compliance with regulations about sustainability.

Potential for certification

Of these 10 winning product characteristics, potential for certification can have the greatest influence on product competitiveness. However, certification itself costs both for compliance and in the time taken to become and remain certified. Thus, there are several questions that need to be asked before products are considered for certification.

Does the market care?

For some products the origin has no bearing on the price. Industrial oils, for example, can have a range of sources and, currently, few buyers will pay a premium for oils produced under sustainable conditions that maximise benefits to poor producers. The niche market for certified products is one that is willing to pay extra for such certification.

Will certification bring access to a wider market?

The market for some products may be so narrow, or the product so specialised, that certification is not necessary. This is also true if there is no competition

and the product is unique. However, success breeds imitation and, while there may be no competition at present, certification can be seen as an investment for the future.

What are the costs?

Certification costs vary with type and organisation. Use of the Fairtrade mark costs 1.8% of net sales value for all products, with a minimum of Rp1.5 million per quarter (Fairtrade 2006). Organic certification costs through International Certification Services is at least Rp2.4 million per year (International Certification Services 2006) and, at a different scale, certification with the Forest Stewardship Council costs more than Rp225 million as a one-off cost (Forest Stewardship Council 2006). These charges are levied on each product either as a flat charge or a charge per unit of output, depending on the certification scheme, and are generally levied on the marketing organisation. Benefits from certification must at least exceed these costs if it is to be warranted.

Is the product eligible for certification?

The applicability, benefits and costs of each form of certification need investigation before being sought. Each of the certification groups has a different range of criteria for eligibility. The Fairtrade Mark, for instance, covers foods including bananas, cocoa, coffee, cotton, dried fruit, fresh fruit and fresh vegetables, honey, juices, nuts/oil seeds, quinoa, rice, spices, sugar, tea and wine as well as cotton, cut flowers, ornamental plants and sports balls. Certification for herbal and fruit teas and handicrafts is under development. Organic certification has different standards for different markets and different requirements along the market chain (International Certification Services 2006). The Forest Stewardship Council has developed 10 principles and 57 criteria that address legal issues, indigenous rights, labour rights, multiple benefits and environmental impacts surrounding forest management that are applicable to forests around the world (Forest Stewardship Council 2006).

Multiple values

The selection of ‘winning species’ is the first step in expanding the potential for agroforestry systems. The most favourable characteristics for agroforestry will mean little without a number of conditions being met in the place where it is to be grown.

Strong tenure

Agroforestry, particularly when it involves long-term investment in slow-growing trees, requires security of tenure to balance the many risks involved with such an enterprise. Often tenure uncertainty can introduce the risk that discourages investment either by local farmers or by external investors in joint ventures. Strong tenure, backed up by a just system of dispute resolution, is thus a fundamental pre-condition for NTFP profitability.

Economic values and an understanding of existing markets

Market research is a critical initial step to determine whether a product has potential. Analysis must include cost of production against the economic return to producers, handling, packaging, transport, certification and marketing. None of these can be ignored.

Cultural and social context

The social context of production is often critical to success. Important factors will be the cultural constraints on the way decisions are made and implemented. Sometimes collaboration between producers is an essential precondition to success by generating savings in handling and marketing, and coordinating consistency of supply. There may also be issues of gender preference, with some activities likely to favour employment of women over men, or vice versa, that can have consequences on business sustainability. How production of NTFPs fits in with other economic activity should also be investigated. In some places increasing the financial independence and power of one group may be seen as a threat by others who have traditionally held power. An understanding of the likely consequences of business development and the development of contingency plans is thus an important precursor to development. If cultural issues are likely to prevent new product development they may need to be discussed and negotiated before investment is committed.

Extent of local value-adding

As noted above, the potential for value-adding is an important attribute of a ‘winning product’. This potential must exist not only in the product but in the community where the product is grown if maximum benefit is to be derived by growers, and sometimes if the growing is to be profitable at all. The principal con-

straints on local value-adding are likely to be lack of equipment or skills. The cost of investment in equipment or skills needs to be built into business planning.

Lessons from the past

There are many examples from around the world of success and failure in the development of NTFPs in agroforestry and the return of a just share of benefits back to growers. Examples can be accessed through certification organisations and, as part of the research, lessons learned need to be considered.

Case studies

Gaharu (*Aquilaria resin*)

Gaharu has been a source of material for high quality incense for thousands of years and has a global market. Furthermore, prices have been high, up to Rp. 2.3 million /kg. Owing to overharvesting the trees bearing resin have become increasingly scarce in their natural habitat, and the value of the product has attracted increasingly destructive harvest practices (TRAFFIC 2000, Soehartono et al. 2002). However, new technology enabling production from young trees is making it possible to consider production of gaharu on an industrial scale (Blanchette 2006). Inevitably this will increase availability and decrease price. Countries that have developed commercial plantations of the trees and the appropriate technology will reap rewards from adopting the innovation. Those who brought the species into horticulture intended that benefits should accrue to small growers in remote areas, but the production costs and pricing structure have not yet settled enough to know whether this will be possible.

Kutu lak (Lak insects and varnish)

Shellac or lak is produced from the secretions of the shellac insect (*Tachardia lacca*). There are three host trees for the insect, *kesambi* (*Schleichera oleosa*), *akasia* (*Acacia catechu*) and *jamuju* (*Cuscuta australis*), but the best quality lak is derived from *Schleichera oleosa*. The main global production centre is currently India, which determines the overall price, but it has been exported from Sumba for many years, primarily through Surabaya in Java where the trade is controlled by a small number of exporters. Prices vary from Rp10,000–25,000/kg, depending on quality, with a farm-gate price of around Rp10,000–12,000/kg.

Harvesting is non-destructive and is possible every 5–6 months, so it can provide a relatively reliable source of extra income. Production is, however, strongly affected by fire and fire management that itself is affected by land tenure issues.

Handicrafts

Over 80,000 people in NTT are involved in the production of handicrafts of various sorts (Table 1), so are already value-adding to raw materials. Of these the most important are woven textiles, which can make a substantial difference to livelihoods, and are an essential source of cash in years when crops fail or are burnt by wild fire (Russell-Smith et al. 2006). The textiles themselves rely on a range of NTFPs. They are woven from cotton (*Gossypium* spp.). This can be hard to source, especially in a pure form lacking rayon that will hold dyes effectively (Ingram and Ingram 2006). A range of other species are used for dyes and mordants. Amongst the dyes is lac, which produces a red colour. Another is *mengkudu* (*Morinda citrifolia*), the roots of which produce high concentrations of the dye morindin (McClatchey 2002). However, use of *mengkudu* requires a source of mordant, which is derived from the bark of the increasingly scarce rainforest plant *jirak* (*Symplocos* sp.) (Grae 1974). While imitations using factory looms and artificial dyes are supplied cheaply to tourist shops, often using traditional motifs from other areas, original textiles using traditional dyes can fetch a premium price. Incorporating plants important to the textile industry such as superior breeds of *mengkudu* and *Symplocos* into agroforestry can increase productivity and reduce costs, thus improving returns to weavers.

Table 1. Handicraft production in NTT 2002–Kerajinan Tangan NTT 2002 (Independent Research and Advisory 2005)

Type/jenis	No. of villages/desa	No. of people/rakyat
Leather/Kulit	19	46
Wood craft/Kerajinan kayu	323	2,009
Metal jewellery/Perhiasan logam	47	188
Cane work/ceramics/Hasil rotan/Ceramics/keramik	356	11,557
Weaving textiles/Kain tenun	1,168	64,818
Food/Makanan	307	6,766
Others/Lain-lain	201	4,602

Industrial products

A range of species that grow readily in NTT are becoming increasingly attractive as sources of industrial products. Oil from the seeds of *kemiri* (*Aleurites moluccana*) is already exported to Surabaya, but faces competition from the larger Indian market. So too does *Jarak budeg* (*Jatropha curcas*), a source of seed oil that can be used as an additive to diesel. Another potential source of industrial products is *tuwa areuy* (*Sapindus saponaria*). Commonly planted as a living fence in Indonesia, the seeds are also a source of industrial saponins that can be used, for example, in fish farming, fire extinguishers and molluscicides. While markets have not yet been established, it has potential to be collected on a large scale in NTT.

For each of these examples, and many other potential products, a careful assessment needs to be made against the criteria listed above. In NTT there appears to be considerable potential to extend the long tradition of incorporating NTFPs into agroforestry for the benefit of subsistence farmers.

Recommendations

Survey existing markets—local, regional and international—in order to:

- identify NTFPs with suitable silvicultural and growth characteristics for agroforestry systems
- evaluate the economic potential of the most promising products, giving prominence to species with the highest potential for agroforestry systems
- evaluate the social, cultural and economic context to support the most promising products
- establish demonstration plantings of the most promising species.

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Australia – Nusa Tenggara Assistance for Regional Autonomy (ANTARA) Program

John Maxwell

Abstract

The Australia – Nusa Tenggara Assistance for Regional Autonomy (ANTARA) Program is primarily aimed at reducing poverty in the Indonesian provinces of East Nusa Tenggara and West Nusa Tenggara, which are amongst Indonesia's poorest provinces. The mandate of ANTARA is outlined. ANTARA is initially funded for 2005–09 and is likely to be extended.

Australia – Nusa Tenggara Assistance for Regional Autonomy (ANTARA) Program

John Maxwell

Abstrak

Program Australia – Nusa Tenggara Assistance for Regional Autonomy (ANTARA) bertujuan dasar untuk mengurangi kemiskinan di propinsi NTT dan NTB di Indonesia yang merupakan bagian propinsi termiskin di Indonesia. Mandat kepada ANTARA telah diberikan. ANTARA pada dasarnya diberikan dana untuk masa 2005–09 dan ada kemungkinannya untuk diperpanjang.

In the Indonesian provinces of East Nusa Tenggara (NTT) and West Nusa Tenggara (NTB), poverty is a complex phenomenon and poverty levels have remained largely unchanged throughout decades of domestic and external development interventions. NTT and NTB are among the five poorest provinces in Indonesia.

In line with the Australia–Indonesia Development Cooperation Strategy, the Australia – Nusa Tenggara Assistance for Regional Autonomy (ANTARA) Program is an innovative, flexible program aimed at reducing poverty in NTT and NTB. It is intended that this will be achieved through a longer-term commitment to sustainable and equitable social and economic development by improving district and provincial governance, improving the quality of and access to essential services and increasing peri-urban and rural incomes.

ANTARA will operate initially over 5 years (2005–09), with funding of up to A\$30 million. It is

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anticipated that a second phase of ANTARA assistance will be required post-2009, given the scale of the development challenges faced by these provinces. ANTARA will commence in NTT, with a base in Kupang, and will be extended progressively into NTB at some point in the future.

ANTARA has a threefold mandate:

- to improve coordination and cohesion among relevant current and future Australian development projects, and help build greater synergy between these programs and the programs of other key donors so as to maximise their impact on poverty reduction
- develop targeted new activities (for example, in areas such as local planning and budgeting and small business development)
- strategically invest in local and international initiatives with a proven capacity or strong potential for impact and expansion.

To strengthen prospects for sustainability, ANTARA will develop pragmatic partnerships with a broad range of stakeholders within local governments, business communities and civil society organisations. The aim would be to promote local ownership and, to the extent possible, work through local systems and processes. ANTARA will build on the experience of other significant donors active in NTT, or elsewhere under similar programs.

The Ministry of Home Affairs (Regional Development) is the counterpart agency at central govern-

ment level and Provincial BAPPEDA the counterpart agency at the province level.

AusAID has engaged a program director and a management support team to lead the implementation of the program. They will be responsible for the overall strategic direction, management and quality assurance aspects of the program on behalf of the Government of Australia.

Some early activities to be undertaken under the ANTARA program will include, but are not limited to, the following:

- expanded provision of specialised clinical and surgical services to public hospitals in certain districts within NTT undertaken by a team of Australian specialist surgeons and support personnel working closely with local hospital administrations
- assistance to improve the efficiency and effectiveness of the procurement and distribution of essential pharmaceuticals and other medical supplies initially in two districts and the relevant provincial agencies
- support for the West Manggarai Tourism Assistance proposal, in collaboration with Swisscontact
- support for the sharing of information and experiences about current responses to the food insecurity situation in NTT. AusAID is already funding a World Food Programme resident position in Kupang for the next 2 years.

Funding agencies' program priorities—ACIAR

Russell Haines¹

Abstract

ACIAR's mandate to focus on identifying and solving agricultural research problems puts its activities in the medium- to long-term time frame. This does not prohibit responses to unexpected and therefore unforeseen events that are not factored into ongoing activities. The priorities that ACIAR sets are designed to integrate and deliver against the drivers of the Australian aid program, the areas where they intersect with Indonesian Government priorities, and the overlap with Australian expertise in agricultural research. As a guide, ACIAR publishes an annual operational plan that outlines priority areas for the coming year within the broader context of a changing external environment, the internal dynamics of Indonesian Government policies, and the impacts of both on agriculture and changing priorities. Through a combination of projects bringing together Australian, Indonesian, and sometimes multilateral, expertise, results can be delivered that help boost the incomes of Indonesian smallholders.

Increasingly, ACIAR is seeking to link extension specialists from government, NGO and private sectors into the development and delivery of projects, particularly where these impact on farming systems at the community level. The end result has been the delivery of a range of project outcomes that are of benefit to Indonesian farmers and agribusiness and, through these, the broader economy.

ACIAR's commitment to working in Indonesia remains, with growth in the overall program expected to continue, particularly as components of the Australia Indonesia Partnership for Reconstruction and Development begin. Agriculture continues to underpin livelihoods in many areas of Indonesia; while this remains the case, research for development to boost farmer incomes through increased system productivity will be needed. While the nature of agriculture might change, and with it priorities for research and development, addressing agricultural development problems remains the mandate of ACIAR.

Agen pendanaan prioritas program funding— ACIAR

Russell Haines^{1a}

Abstrak

ACIAR bertugas untuk berfokus pada pengidentifikasi-an dan penyelesaian permasalahan yang terjadi pada penelitian pertanian pada jangka waktu menengah dan panjang. Hal ini bukan melarang pemberian tanggapan terhadap kegiatan yang tak nampak dan tak terduga, yang tidak berfaktor pada kegiatan terus menerus.

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Prioritas yang di tetapkan ACIAR dirancang untuk memadu dan menyampaikan program Australian Aid dalam kerjasamanya dengan prioritas pemerintah Indonesia yang ditunjang oleh tenaga ahli Australia dibidang penelitian pertanian.

Sebagai petunjuk, ACIAR mempublikasi Rencana Operational Tahunan yang menggaris bawah prioritas di tahun berikutnya, dalam konteks yang lebih luas pada perubahan lingkungan eksternal, dinamika peraturan dalam negeri pemerintah Indonesia serta akibat dari pada pertanian dan prioritas perubahan.

Melalui kombinasi proyek membawa bersama Australia dan Indonesia, tenaga ahli multilateral, latihan bersama pada topik yang relevan,, hasil yang dapat meningkatkan pendapatan pemegang saham kecil Indonesia dapat terselenggara.

Secara meningkat ACIAR terus mencari perluasan penghubung di bidang spesialisasi, dari pemerintah, LSM dan sector pribadi, kedalam perkembangan dan pelaksana proyek, khususnya dimana dampak sistem pertanian sampai pada tingkat masyarakat.

Hasil akhir merupakan penyampaian dari hasil berbagai proyek yang berupa keuntungan bagi petani Indonesia dan pengusaha tani, serta ekonomi yang lebih luas.

ACIAR berkomitmen untuk bekerja di Indonesia tertinggal, dengan pertumbuhan program secara umum yang diharapkan untuk terus berlanjut, khususnya sebagai komponen dari kerjasama Indonesia Australia untuk memulai rekonstruksi dan pembangunan.

Di banyak daerah di Indonesia pertanian masih terus merupakan penopang hidup, selama hal ini terus berlangsung kasus penelitian untuk pengembangan demi memicu pendapatan petani melalui peningkatan sistem produktifitas harus terus dibutuhkan. Sementara sifat pertanian berubah, dan dengan prioritas untuk penelitian dan pengembangan, penyampaian permasalahan tetap menjadi tugas ACIAR.

Introduction

The relationships between Indonesia and Australia are wide-ranging and have grown stronger in recent years. The breadth and depth of these ties cover strong political, commercial, academic and cultural links, characterised by people-to-people connections. Commercially, trade between Indonesia and Australia was valued at A\$6.9 billion in 2004–05. More than 18,000 Indonesian students were studying in Australia in 2006, and almost 12,000 Australians list Indonesia as their present country of residence. In 2005 alone there were 23 visits between the two countries by government ministers and parliamentarians, including reciprocal visits by the Indonesian President and Australian Prime Minister.

One area where these ties are strong is cooperation in agricultural and rural development. Many of the activities in this field operate through Australia's aid program to Indonesia. The emphasis of this program is poverty reduction and sustainable development.

Australian aid to Indonesia is valued at almost A\$2 billion over the next 5 years. The Australia Indonesia Partnership for Reconstruction and Development (AIPRD) announced in January 2005 accounts for half of this funding, focusing on economic management, democratic institutions, security and stability, and basic social services. In total the AIPRD comprises A\$500 million in grants and

A\$500 million in highly concessional loans over 5 years.

In rural and regional areas of Indonesia, where agriculture is the foundation of livelihoods and the main form of employment and food security, achieving the goals of poverty reduction, security and stability is greatly enhanced through increased production of staple foods and also marketable commodities.

ACIAR in Indonesia

The Australian Centre for International Agricultural Research (ACIAR) is the lead agency for this component of the Australian aid program, with a mandate to help identify agricultural problems in developing countries and to commission collaborative research and development in fields where Australia has special research competence.

ACIAR began commissioning research in the early 1980s, with support for a program of collaborative research with Indonesia beginning in 1982. Today ACIAR's largest bilateral partner is Indonesia, with an expected investment in 2006–07 of around A\$10 million.

There are several reasons for this, some of which overflow into the wider Indonesia–Australia relationship. Australia and Indonesia share common resources, notably fishing stocks in the Timor and Arafura seas, and species of crop plants, trees and

animals. A number of key trade commodities are derived from these resources. The mechanisms by which pest and disease threats are spread are also shared; for example, migratory birds may spread avian influenza not just across the region but across the globe.

While all these issues and many others are important, it is not possible for ACIAR, operating throughout the Asia–Pacific region, to respond directly to each and every one in any single country, let alone in many countries. For Australia, the proximity of Indonesia, together with these shared resources, creates a level of strategic importance that results in increased investment. This is reflected in the growth of ACIAR's program in Indonesia in recent years.

Ensuring that agricultural production continues to reduce poverty and increase national and regional stability is important, but it is also important to ensure that the institutions that can deliver such productivity advances are maintained and enhanced. This is a major challenge, particularly with the recent decentralisation of Indonesian government and, with it, decentralisation of scientific research and extension responsibility. Despite this, a majority of the expertise remains in Jakarta, Bogor and other Javanese centres. The need for capacity development in science in regional centres outside Java is vital to continued efforts to lift productivity. Building capacity linkages into ACIAR projects and capitalising on these has been a feature of ACIAR's partnership model.

Building research capacity

Rather than deliver a product through Australian-based research, ACIAR projects involve partner country institutions in project activities. For ACIAR, developing capacity in eastern Indonesia, and recently in Aceh following the December 2004 tsunami, is an important component of research activities.

This is achieved in two ways: through informal project-specific training and through formal fellowship schemes and courses. Training is designed to boost not only the capacity but also the ability of partner country scientists to contribute within and beyond the project's life. Fellowships are restricted to scientists currently or recently involved in an ACIAR-funded project. ACIAR is increasing its investment in fellowships that allow eligible scientists to gain postgraduate qualifications at Australian universities.

Courses to build research capacity cover a variety of themes linked to the needs of the partner country. For Indonesia, courses seek to link researchers to applied research results. Course components include: economics and social science for biophysical scientists; experimental design and analysis; participatory agricultural research; project evaluation and impact assessment training; and agribusiness, particularly in supply chain management. However, training is secondary to the commissioning of research projects to address the agreed priorities for ACIAR work in Indonesia.

Agricultural research themes

Projects cover the full range of agriculture from policy and farming inputs to generating productivity increases and delivering sustainable resource management.

Segregating the delivery of agricultural research into component parts, such as separating policy from production, does not always deliver the best results. ACIAR has grouped its research program streams into four broad categories each of which produces significant complementarities without negating opportunities for cross-category project linkages.

The four categories, with three research program streams, are:

Economics

- agricultural development policy
- agricultural system economics and management
- policy linkages and impact assessment

Crop production, protection and processing

- crop improvement and management
- crop protection
- horticulture

Livestock and fisheries

- animal health
- livestock production systems
- fisheries

Natural resource management

- land and water resources
- soil management and crop nutrition
- forestry.

In Indonesia, projects operate within a broad medium-term strategy that emphasises increases in farmer and fisherfolk incomes. This is achieved by focusing on the production systems for livestock, fisheries, forestry and horticulture crops. Focusing on production systems is intended to add value to Indonesian agricultural products, including those

with potential to develop into export commodities and markets. An emphasis on farming as agribusiness underpins research.

ACIAR's projects take a longer-term view of development, rather than delivering through direct handouts. By increasing productivity throughout the whole system farmers can leverage against this increased production, to sell to markets, to gain more income, to have a living 'savings bank' and to diversify their farming activities.

The longer-term engagement also involves a strong research component addressing conservation of the resource base for agriculture. Investing in increased production today at the expense of limiting future production by degrading the resource needed for tomorrow is irresponsible and unsustainable.

Responding to emerging issues

On occasion ACIAR projects also respond to short-term needs, most notably following the December 2004 tsunami, and more recently the outbreaks of avian influenza.

Activities in Aceh demonstrate the linkages between the short-term and longer-term approaches. ACIAR was not involved in the immediate response, agricultural research taking a back seat to the need to recover life and re-establish infrastructure. Once this had been achieved or, in the case of infrastructure rebuilding, had begun, the importance of agriculture in the livelihoods of many smallholders was addressed.

The first stage of ACIAR's response was a visit by a team of specialist scientists, including ACIAR staff, to establish the most immediate priorities. From this visit, and consultations with Indonesian authorities and staff of research institutes in Aceh and beyond, priorities were identified.

Training in key areas of soil sampling and analysis, and fisheries and aquaculture research was provided to ensure that the expertise and capacity to undertake research locally and engage in projects with Australian partners was in place. Since that time two projects addressing soil rehabilitation and assessing the status of fisheries resources and community needs have begun. Both have been underway for 1 year.

In the longer-term ACIAR continues to engage with Indonesian, Australian and international efforts aimed at rebuilding in Aceh. Further training as part of a capacity-building program on the re-establishment of brackish-water aquaculture has been devel-

oped. Scoping of further project work is also underway. Some of these projects are in conjunction with the AIPRD.

The approach adopted in Aceh is similar, though far more compressed than normal, to that adopted by ACIAR elsewhere in Indonesia; namely, to understand the local situation and priorities; match Australian expertise to these priorities; build up Indonesian expertise where needed; and deliver, through the project modality, sustainable and realistic research results that can be used by smallholders to increase productivity through their systems and from this boost income-earning potential.

A key component of this approach is delivering the results that can increase productivity for farmers. Increasingly, ACIAR is placing priority on identifying the pathways that will lead to adoption within the project development phase. Adoption pathways are those that lead to end users at the community or farm level. For ACIAR this has involved engaging with new players, NGOs, extension agencies and the private sector in addition to, and where appropriate in conjunction with, research scientists. At times this approach will involve closer interactions between researchers and end users.

This support for development linkages between research agencies and beyond mirrors the support for linkages between research capacity in Java and elsewhere in Indonesia. ACIAR is encouraging links between research agencies in agriculture, forestry and fisheries and the policy and implementation directorate generals in those ministries; and links between research agencies in Java and adaptive research agencies and planning agencies in eastern Indonesia and northern Sumatra.

Priority areas in Indonesia

The emphasis on eastern Indonesia and northern Sumatra reflects a geographic shift in ACIAR's program in Indonesia. As previously mentioned, decentralisation has changed the dynamics of research in Indonesia. Where once centralised agencies were responsible for conducting research that was applicable across the nation, and extension agencies delivered this, now decentralised agencies bear a far greater proportion of this responsibility.

The Australian Aid program, including ACIAR, has recognised the need to help in this difficult transition. Eastern Indonesia is the highest priority area, with the total regional balance of investments being

influenced by the coincidence of Australian comparative advantage and the Australian Aid program.

Nusa Tenggara Timur, Nusa Tenggara Barat, West Papua and Sulawesi are the focal points of Australian Aid initiatives, with appropriate collaboration with research and development providers in Java and parts of Sumatra able to support such interventions playing an important role.

One example of this is agricultural policy research, where a strong centralisation in Java is still evident. Such policy research has the potential to be far-reaching, both in terms of geographic spread and also downstream impacts. The recent avian influenza outbreak saw the need for policy decisions that have ramifications far beyond poultry farmers in any one area of Indonesia.

While ACIAR has responded with a small suite of projects targeting areas that complement activities by other groups and engaging several countries in Asia, one aspect that remains in need of research is policy approaches and ramifications. Feedback gathered during the course of project development indicated that both the Jakarta-based Directorate General of Livestock Services and the Disease Investigation Centre in Denpasar (responsible for all eastern provinces) believed that properly conducted risk analysis and evaluation of potential policy strategies would be invaluable aids in decision-making.

A key concern was the direct and indirect costs of disease outbreaks including spillovers to other sectors. With both agencies responsible for advising the Government of Indonesia regarding policy responses, and considering the potential of these responses to impact on eastern provinces both directly through agricultural losses and more indirectly through flow-on losses, effective policy research that links the centralised agencies to eastern provincial agencies is vital. For this reason it will also remain an important component of ACIAR's program.

Complicating these matters is the changing global trade environment, including the changes required for World Trade Organization compliance and the emerging trade regulatory environment.

With an aim of increasing agricultural production, including focusing on commodities that have potential to be exported, policy approaches to facilitate a positive trade environment are important. Research is being undertaken to support a greater understanding of the impacts of this increasingly globalised environment, and of factors such as technological

changes to facilitate improved productivity both within agriculture and within industries that are end users of agricultural products.

The implications of decentralisation for the sustainable management of agricultural and land resources has also been addressed through ACIAR-supported research. This includes support for policy initiatives of provincial and regional agencies that are dealing with these issues directly, such as forestry policy.

Another aspect of this program is establishing linkages with international agricultural research centres based in, or with representation in, Indonesia, and those with a comparative advantage. These international centres are not-for-profit research institutions with a mandate covering key crops, animals or resources.

ACIAR supports these centres through both direct or core funding and by engaging relevant centres in projects. Where the expertise of these centres provides a competitive advantage, ACIAR engages this expertise in projects that also link Australian and partner country research scientists, including those in Indonesia. Projects in Indonesia involve the Center for International Forestry Research, the World Agroforestry Centre, the International Potato Center and the Asian Vegetable Research and Development Center. This represents a significant increase in multilateral investment, through ACIAR, in Indonesia.

The year ahead—addressing priorities

Within this broader context ACIAR seeks to outline priorities for the coming year through publication of an Annual Operational Plan that includes key priority areas for each country. Priorities for Indonesia are based on the formal consultation that took place between Indonesian agencies and ACIAR representatives in 2002, emerging priorities since that time, and areas of emphasis in the coming year.

To facilitate possible linkages in projects addressing priority areas, ACIAR has grouped priority areas into six thematic areas. In 2006–07 the collaborative program emphasises animal health and production, crop protection (especially where integrated with horticultural crop production), forestry, fisheries and agricultural policy research. The six themes and their subthemes are:

Policy options for Indonesian agribusiness

- Impact of trade agreements on food security and incomes of small producers
- Empowerment of small producers for better access to production factors and market returns
- Structural adjustment options for agribusiness to optimise economic and social benefits.

Recent and proposed projects on this theme examine the implications and possibilities of a changing internal environment, including aspects such as decentralisation, and ramifications of policy decisions and external developments upon agricultural sectors in Indonesia. A secondary component is improvements in productivity for smallholders through both macro and microlevel policies.

One project in this area is building a small-scale model of the North Sulawesi economy to examine linkages between broader economic policies, the coconut industry and the Indonesian economy as a whole. The coconut industry is in many ways a microcosm of the changes that are taking place in other agricultural industries in Indonesia and of the potential for regional and national policy initiatives to impact, both positively and negatively, at the provincial scale. A recently concluded project examined contract farming arrangements and the implications for smallholders of entering into contractual agreements.

Ideas for potential projects include the role of social capital in rural development in Eastern Indonesia and the possible implications of trade futures for structural adjustments.

Pest and disease management for Indonesian agriculture

- Management of livestock diseases and disease risk to improve production, enhance food safety and establish trade relationships
- Integrated pest management, especially in vegetables
- Rodent pest control in upland crops and paddy rice
- Host plant surveys and preharvest control of fruit flies
- Diagnosis and control of *Phytophthora* on citrus rootstocks, potato and pepper
- Management of major pests and diseases of bananas
- Information systems for quarantine.

A range of pests and diseases are present in Indonesia, affecting animal health, vegetable and horticultural

cropping, and tree utilisation. Animal health has been and continues to be a priority for research in Indonesia, particularly as it reduces productivity and impacts on potential income generation through sales of livestock, both domestically and internationally. Jembrana disease, classical swine fever and foot and mouth disease are all the subject of projects, including one to develop a national surveillance system for the last two diseases mentioned and also avian influenza.

Utilising integrated disease management packages, and management options to limit or mitigate the threats of wilt diseases, huanglongbing, anthracnose and phytophthora blight are the subject of a suite of current and developing projects. The importance of horticulture industries, both for vegetables and fruit production make this a continued area of priority. Deforestation in parts of Indonesia requires a careful approach to management, both for new and existing resources. Disease constraints are one area of concern, with projects to select improved trees and disease-resistant trees for planting a priority.

Productive smallholder aquaculture

- Sustainable shrimp and finfish farming systems (genetic improvement, disease management, feeds and nutrition)
- Improved processing, packaging and transport technologies that extend product life and increase market value.

Increasing pressure on catches of wild fish from the waters surrounding Indonesia is placing stress on aquaculture industries to produce more fish. This in turn results in an increased number of disease outbreaks as production intensity expands, and an exploitation of new coastal lands not always suited to aquaculture. Disease outbreaks affecting shrimp and finfish farming are being examined, along with assessing land and water suitability, including in reservoirs. Environmental impacts are being addressed too.

Management options for both shrimp and finfish production, to boost survival rates, particularly from larval stages, are being developed and disseminated. Past project results are being incorporated into the development and testing of such packages.

Sustainable utilisation and management of fisheries and forestry resources

- Impact of decentralisation on natural resource management and agricultural policy development

- Stock assessment and management of shared and common interest fisheries
- Management of inland open water fisheries, including aquaculture
- Development and domestication of eastern Indonesian non-timber forest product species for income generation
- Species selection and breeding to support plantation development, with emphasis on indigenous species, land rehabilitation and environmental services in eastern Indonesia
- Development of tree farming models with improved smallholder to plantation company cooperation
- Improved utilisation and value-adding to timber from fast growing plantation species.

Increased utilisation of both fisheries and forestry resources has resulted in reduced richness of both resources, and with this a threat to the livelihood of coastal and forest-based communities. The sustainable management of wild fisheries resources is at the heart of several projects examining issues including illegal, unregulated and unreported fishing that makes monitoring catches for sustainable harvests more difficult, and boosting Indonesia's capacity to monitor tuna and other stocks. Shared resources between Australia and Indonesia remain a priority, as does tapping into the lucrative live reef fish trade in the Asia-Pacific without accelerating harvesting towards unsustainable levels.

Forestry resources are equally valuable to many communities, particularly partnerships for plantation forestry between local communities and timber companies. Ensuring sustainability in these partnerships, and policy initiatives to boost sustainable forest management at the provincial government level, are important research priorities. Management options that boost plantation productivity and improve income for smallholders are also the subject of proposed research.

Profitable agribusiness systems for eastern Indonesia

- Improving the capacity of eastern Indonesian R&D providers to support market-driven adaptive research
- Development of sustainable crop–livestock systems for the dry tropics of eastern Indonesia
- Enhancement of Bali cattle productivity through improved management

- Improved on-farm water management in eastern Indonesia.

Livestock industries in eastern Indonesia have substantial capacity for improvement without significantly altering traditional practices to the extent of completely replacing these systems. Instead, recent research initiatives have worked with livestock farming communities, introducing simple changes that boost calf numbers, growth rates and, ultimately, incomes. Scaling up these herd management techniques is the subject of research drawing together past project outcomes. Linking scaling up with extension agencies and building these groups to practice outcome delivery at the village level remains a priority.

The proven success of this past research has also shown that crop–livestock systems can be similarly enhanced through appropriate and targeted management strategies. This extends to management of other aspects of farming systems, from rodent pest management to improving crop utilisation and soil and water management. The focus on whole systems includes suitable linkages between systems where these can add value to production outcomes.

Technical cooperation to underpin post-tsunami rehabilitation of agriculture and fisheries

- Redevelopment of capacity and facilities for brackish-water aquaculture of shrimp and finfish in Aceh
- Needs assessment and resource status of fisheries
- Restoration of salinised and silted agricultural areas to crop production
- Integrated vegetable crop production in tsunami-affected areas.

The Australia Indonesia Partnership for Reconstruction and Development

ACIAR's involvement in technical training and research in tsunami-affected areas of Aceh will continue in the medium term, with a dual focus on re-establishing cropping and the rehabilitation of fishing industries, both wild capture and aquaculture. Linkages with international efforts, and with the Australia Indonesia Partnership for Reconstruction and Development (AIPRD) that enhance research to rebuild Aceh, are a priority.

ACIAR and AIPRD are cooperating on the rehabilitation of the Regional Brackishwater Aquaculture Development Centre (RBADC) at Ujung Batee, the technology development and extension centre for aquaculture in northern Sumatra extensively damaged in the tsunami. AusAID is managing the physical infrastructure and construction component while ACIAR's focus is on training and re-establishment of aquaculture research and development. Re-establishing farming in saline land affected by the tsunami, including managing soils that have had salt and debris deposited over them, is also being investigated for project-based implementation.

Beyond Aceh ACIAR's involvement in AIPRD will focus on long-term sustained cooperation, giving priority to economic and social development projects and Indonesia's programs of reform and democratisation. ACIAR is likely to assist in the design and management of at least one component of other AIPRD programs.

As of February 2006, ACIAR had been asked to design and deliver a Private Sector Development and

Rural Productivity program component. The major program at this stage is the Smallholder Agribusiness Development Initiative (SADI).

The goal of SADI is to improve rural sector productivity and growth in four eastern provinces—Nusa Tenggara Timur, Nusa Tenggara Barat, South East Sulawesi and South Sulawesi. ACIAR will manage the third SADI subprogram 'Support for market-driven adaptive research'. The other two subprograms are 'Enhanced smallholder production and marketing and strengthened private sector agribusiness' and 'SME development'.

The objective of the third subprogram is to strengthen adaptive agricultural research and development provision in the four targeted provinces. Capacity building would centre on 'learning-by-doing', with implementation mechanism through collaborative projects and training. Province-level consultative processes will ensure that activities are driven by demand.

Appendix

Higher education capacity building in eastern Indonesia: a briefing paper

**Dr Penny Wurm¹, Professor Carole Kayrooz², Dr Ferry Karwur³
and Professor Greg Hill⁴**

This proposal builds on the existing teaching and research strengths, cross-institutional collaborations, research networks and goodwill already established among the proponent universities. In light of an increasing focus on eastern Indonesia and on collaborations that can support improved living conditions for this poorest region, as well as the existing links among regional partners, the time is ripe for a substantial project focusing on building capacity for higher education in eastern Indonesia. This paper captures resolutions arising from the *Integrated Rural Development in NTT Workshop* held in Kupang during 5–7 April 2006.

Aims of the project

This new project will build capacity for higher education in Nusa Tenggara Timur (NTT). It will comprise three key components:

- postgraduate training and scholarship
- joint development of innovative curriculum
- staff development through exchanges, mentoring and training.

The project will complement completed or ongoing projects in the region that share the overall goal to:

...increase the capacity to plan and monitor land management strategies to increase food security and alle-

viate poverty in rural communities in Nusa Tenggara Timur (NTT), and to enhance adoption of wise land management through community engagement. (Extract from current AusAid PSLP grant application, Charles Darwin University)

This project will involve collaboration among two Australian universities, Charles Darwin University and University of the Sunshine Coast, and two Indonesian universities, Satya Wacana Christian University and Nusa Cendana University, all with existing partnerships, expertise, interests and activities in the region.

The capacity building will be multidirectional. Indonesian partners will provide extensive and active networks within the region; students, staff and graduates who live and work in the region; and extant and developing research capacity. Australian partners will bring existing research expertise in wet–dry tropical landscapes appropriate to capacity-building issues facing eastern Indonesia, as well as high-quality existing undergraduate and postgraduate curriculums in natural resource management and primary industries. All four partners will benefit from the internationalisation of their activities, an inherent part of quality higher education.

The project will result in improvements to integrated rural development, natural resource management and livelihoods in eastern Indonesia through:

- increased capacity for international engagement among regional partners
- improved, innovative and regionally relevant university curriculum, resulting in more capable graduates working in regional institutions and organisations

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- increased research capacity at all four partner universities
- increased ability to attract collaborative, regionally targeted funding.

Specific funding will be sought for the following project activities:

- funded research collaborations among partners
- funded staff exchanges and mentoring
- new, funded postgraduate, undergraduate and short-course enrolments at partner universities
- funded collaborations for curriculum development.

Many of the supporting activities are underway or being planned, and are demonstrably achievable with appropriate funding. These activities demonstrate the existing goodwill and capacity among partners; however, individual activities will be enhanced and expedited with suitable funding for a comprehensive higher education capacity-building project.

Existing strengths, capacities and collaboration

Satya Wacana Christian University (UKSW) was established by churches in eastern Indonesia. It has a sister university in Kupang, Timor (Artha Wacana), a second campus in Waingapu, Sumba (Wira Wacana), and is in the process of developing a new campus in Soe, Timor Tengah Selatan district (TTS). Students at UKSW are drawn primarily from eastern Indonesia, and there is an extensive and growing network of UKSW graduates working in government departments and academic institutions throughout this region. The university is a key provider of postgraduate coursework education for the region, and is seeking to further develop a curriculum of specific relevance to natural resource management and sustainable development in the wet–dry tropics. The university is also working towards accreditation as a provider of postgraduate research degrees. The university is now establishing a nursing school that will focus on the requirements of eastern Indonesia. UKSW hosts a Language Centre that is renowned for its Bahasa Indonesia and English courses. Many UKSW lecturing staff have PhD qualifications and are active researchers in areas such as molecular biology, rural development, aquatic ecology and environmental chemistry. The university's senior staff have good relationships with the Jakarta-based Ministries, whose support for research and other proposals is needed if they are to be viewed favourably by international granting agencies. The university

hosts a cross-faculty Centre for Studies in Eastern Indonesia, through which research projects in eastern Indonesia are coordinated. As part of a Memorandum of Understanding (MoU) between UKSW and TTS (one of five districts in West Timor), UKSW led a land-use survey in central West Timor in 2000 in collaboration with the Provincial Development Planning Board for East Nusa Tenggara (BAPPEDA NTT). Further research projects are planned under the auspices of this MoU with TTS. UKSW has a MoU with Charles Darwin University for research and education collaboration.

Nusa Cendana University (UNDANA) is a regionally important public university, located in Kupang. It has established undergraduate programs in education and primary industries. Its students are drawn primarily from NTT. Staff members at UNDANA have a developing research profile. At an institutional level the university is seeking to foster independent learning and entrepreneurial skills in their students and graduates. UNDANA is represented on the Board for the Centre for Studies in Eastern Indonesia at UKSW.

Charles Darwin University (CDU) has existing research capacity in the sustainable development of wet–dry tropical landscapes. While already an active collaborator with non-university partners, CDU has recently signed a MoU with the Northern Territory Government that focuses on strengthening engagement between the university and government agencies. CDU researchers have an established profile in areas such as remote sensing and geographic information systems (RS/GIS), tropical ecosystem function and management, molecular sciences and sustainable livelihoods. The university is a partner in a number of research centres such as the Tropical Savannas CRC, Biosciences North Australia and the Arafura Timor Research Facility. At present CDU researchers are involved in seven projects in Indonesia, five of which focus on eastern Indonesia and East Timor. CDU has a thriving postgraduate research program, an exemplar postgraduate coursework curriculum in tropical environmental management, and established expertise in flexible teaching and learning development. CDU shares MoUs with UKSW and University of the Sunshine Coast.

The University of the Sunshine Coast (USC) has existing expertise in sustainable environments, planning and sustainable tourism. USC and CDU share a MoU (with the University of Mataram, Lombok) for a Bahasa Indonesia in-country language program. The twin pillars of the university's mission are sus-

tainability and regional engagement. There is an emphasis on teaching and research designed around the needs of the local region, so there is expertise in designing an alignment that will be useful to the Indonesian partners across areas such as sustainable land management, health and education. USC also has some complementary areas of focus to those of CDU, for example, in biotechnology aligned with primary industries. USC has close working relationships with the Sunshine Coast Research Stations of the Government of Queensland Department of Primary Industries and Fisheries (one for aquaculture, one for forestry and one for horticulture). There is a core group of staff with broad experience of projects and development work in Indonesia and tropical and subtropical countries elsewhere. CDU and USC collaborated on the recent ACIAR-funded project on fire management in eastern Indonesia.

As regional universities, both CDU and USC are particularly sensitive to, and skilled in, addressing the types of capacity-building issues facing the eastern Indonesian institutions. Both universities have a focus on sustainability and regional engagement appropriate to the challenges facing eastern Indonesia. CDU and USC have a history of cooperation through the New Generation Universities consortium and both have a commitment to Indonesian language programs.

The existing links among these partners are demonstrated by following list of collaborative activities:

- CDU and UKSW members of staff have collaborated to run short courses in GIS/RS for UKSW and government staff, at UKSW.
- UKSW, in collaboration with CDU, is developing a proposal for an intensive field course in eastern Indonesia for advanced undergraduate and postgraduate coursework students. This new course will provide opportunities for cross-cultural engagement for participants, as well as increase the understanding of ecology, natural resource management and livelihoods in wet-dry tropical landscapes.
- A UKSW lecturer has applied for a scholarship for a postgraduate research qualification at CDU, applying RS/GIS to integrated rural development.
- UKSW is establishing a nursing school, focusing on the needs of eastern Indonesia, and has formally invited the participation of CDU Health Sciences staff in its establishment.
- Discussions are underway for CDU to assist UKSW in the establishment of a GIS/RS curriculum at undergraduate level. The Faculty of

IT (UKSW) has allocated 3 months of local salary and accommodation costs to support the secondment of a CDU staff member to UKSW.

- UKSW have trialled curriculum materials developed for the Master of Tropical Environmental Management at CDU as part of the Master of Biology at UKSW.
- CDU and USC staff together teach a residential Bahasa Indonesia course in Lombok (in collaboration with University of Mataram).
- CDU, UKSW and USC collaborated on the ACIAR Fire in Eastern Indonesia Project.
- A member of the Northern Territory (NT) Government staff who is fluent in Bahasa Indonesia and with extensive experience in the Indonesian cattle industry is on secondment to CDU to develop a postgraduate course in tropical beef production.

These examples illustrate activities already underway. However, with a larger integrated project and more comprehensive funding, collaboration will be integrated institutionally at the program level rather than as a suite of small projects.

Potential sources of funding

Umbrella funding for the project will be sought from bodies and programs such as UNESCO, the ASEAN–Australia Development Cooperation Program (AADCP), AusAid and ACIAR. Additional funds for specific activities within the project will be sought from bodies such as the Crawford Fund, The Australia–Indonesia Institute and the University Mobility in Asia and the Pacific (UMAP) program. In-kind and cash contributions will be sought from university partners as appropriate, particularly where this is likely to assist in attracting further funding. In addition, the support of the NT and NTT governments will be sought in the form of short-term staff secondments to educational projects, the provision of materials that may be included in curricula, funding for project staff travel or salary top-ups, and scholarship funds as appropriate.

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