



World Agroforestry Centre
TRANSFORMING LIVES AND LANDSCAPES

COCOA FUTURES

An innovative programme of research and training is transforming the lives of cocoa growers in Indonesia and beyond





The World Agroforestry Centre, an autonomous, non-profit research organization, aims to bring about a rural transformation in the developing world by encouraging and enabling smallholders to increase their use of trees in agricultural landscapes. This will help to improve food security, nutrition, income and health; provide shelter and energy; and lead to greater environmental sustainability.

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Suggested citation: Pye-Smith C. 2011. *COCOA FUTURES An innovative programme of research and training is transforming the lives of cocoa growers in Indonesia and beyond*. ICRAF Trees for Change no. 9. Nairobi: World Agroforestry Centre.

ISBN 978-92-9059-300-3

Publisher: World Agroforestry Centre

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All photographs by Charlie Pye-Smith except pages 6, 27, 30, 32 and 33 by Smilja Lambert.

Front cover: Muis Samsuddin is one of over 20 village cocoa doctors in Indonesia and part of a network of expertise that is helping to improve productivity.

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Foreword

Cocoa provides a living for over 6.5 million smallholder families, a significant source of revenue for a small number of tropical countries, and the key ingredient that sustains the chocolate industry. To keep pace with growing demand, annual cocoa production must rise by 1 million tonnes over the next decade. If that's to happen, millions of hectares of old and unproductive cocoa gardens will have to be rehabilitated.

This booklet provides a remarkable insight into how this is being achieved in one country. In 2003, Mars, Incorporated, one of the world's largest chocolate manufacturers, launched a programme which has enabled many Indonesian cocoa farmers to more than double their yields and incomes. This has been done by encouraging them to adopt 'good agricultural practices', such as pruning and disease control, and the use of high-yielding varieties, either to replace their old trees or rehabilitate them through grafting.

Crucial to the success of the project have been the institutional arrangements trialled and tested by Mars and the local farmers, first in Sulawesi, later in other parts of Indonesia. Farmers learn about new production techniques through demonstrations at Mars Cocoa Development Centres, which in turn support a network of Village Cocoa Clinics. Owned and managed by local farmers, or cocoa doctors, the clinics provide improved planting material and grafting services to local farmers. They have become successful businesses in their own right.






All of this has been done in partnership. Government agencies, research institutes, NGOs, cocoa traders and international donors have worked closely with one another, as well as with Mars and its business partners and competitors. Such has been the success of the project in Indonesia that Mars decided to adopt a similar approach in Côte d'Ivoire, the world's largest cocoa producer, in collaboration with the World Agroforestry Centre.

The Vision for Change programme was launched in 2010. We believe that this unique public-private partnership will revitalize Côte d'Ivoire's cocoa sector, raise yields and quality and significantly improve the welfare of hundreds of thousands of rural families. At the same time, the programme and the partnership will help farmers to satisfy the growing demand for the pods of *Theobroma cacao* – the 'food of the gods'.

Tony Simons
Director General Designate
World Agroforestry Centre

Howard-Yana Shapiro
Global Staff Officer Plant Science
and External Research
Mars, Incorporated

◀ Cocoa is the main source of income for some 500,000 farming families in Indonesia.

A close-up photograph of a man, Muis Samsuddin, wearing a green polo shirt and a grey cap. He is focused on working with a plant stem, using his hands to carefully manipulate it. The background shows lush green foliage, suggesting an outdoor agricultural setting. The man's shirt has a small logo on the left chest and some text on the sleeve. The overall scene conveys a sense of dedication and expertise in agriculture.

*Being a village
cocoa doctor
has transformed
the life and
fortunes of Muis
Samsuddin,
and benefited
hundreds of
local farmers.*

Introduction

In 2007, field staff working for Mars, Incorporated in South Sulawesi suggested to 25-year-old Muis Samsuddin that he should set up a nursery and learn how to grow high-yielding varieties of cocoa. Not only would this help to improve the quantity and quality of cocoa grown around the village of Rewang, it might encourage Muis to sort his life out. At first, he wasn't interested. "I couldn't see the benefit, and in any case I was busy with my motorbike gang and other matters," he recalls.

One day Muis's father asked him to buy 200 cocoa seedlings from a demonstration plot established by Mars in a nearby village. Soon, these were performing far better than the family's old cocoa trees. Muis was impressed: he could see there was good money to be made in cocoa and he accepted a further offer of training from Mars. He is now a 'village cocoa doctor', selling seedlings which are improving local yields and incomes. He also trains farmers how to graft high-yielding varieties onto old, unproductive cocoa trees.

"Being a village cocoa doctor has changed Muis's life," says his mother, Sitti Hawa bte Urrung. "He's a reformed person." After he set up his cocoa clinic, he began to attend evening classes and



▲ Mars and its partners have invested heavily in developing new varieties of cocoa at research sites in Sulawesi..

he is now studying agriculture, part time, at university. Already, he's made enough money from his nursery to renovate the small house where he lives with his wife and young children.

By the end of 2010, there were over 20 village cocoa doctors like Muis in Indonesia. They are part of a network of expertise, established and nurtured by Mars and its partners, which is improving the productivity of the farmed landscape and the livelihoods of the families who grow *Theobroma cacao*, or 'food of the gods'.

A vision of a better world

"Everything we do is about setting the stage for the future," explains Howard-Yana Shapiro, Global Staff Officer Plant Science and External Research at Mars, during a visit to the Mars Cocoa Development Centre in Palopo, South Sulawesi. "Whether we're talking about research and training centres like this, or our pledge to source all our cocoa from certified growers by 2020, or mapping the cocoa genome, it comes down to the same thing. We want to ensure there's enough cocoa to satisfy future demand, and to improve the lives of cocoa farmers at the same time."

In the early 1980s, global cocoa production stood at 1.5 million tonnes a year. By 2010, it had risen to 3.6 million tonnes. Demand for cocoa is increasing by 2% a year and to keep pace, annual production must rise by 1 million tonnes over the next decade. As there is little new land available to create new cocoa farms, the increase in production will have to come from the rehabilitation of existing farms. Mars has sought to encourage farmers to shift from low-input/low-output production to high-input/high-output systems, involving the selection of high-yielding varieties, the use of fertilizer and the targeted use of pesticides.

Most of the world's cocoa is grown by 6.5 million smallholder families, many of whom make a meagre living from their trees. In some countries, the cocoa gardens are poorly managed, over 25 years old and relatively unproductive. Just as significantly, high taxes imposed by some governments have impoverished cocoa growers. However, it needn't be like this: many of the farmers who have been collaborating with Mars in Sulawesi have increased their yields from around 0.5 to 2.5 tonnes/ha/year and improved the quality of their beans. During the past decade, tens of thousands of cocoa farmers benefited from the research, training and extension provided by Mars and its partners in Sulawesi and other parts of Indonesia. Their number will continue to increase during the coming years.

“For the last decade, Sulawesi has been our laboratory,” explains Joseph-Yossi Toledano, Mars Global Manager for Strategic Partnerships and Director of its West African operations. “Besides



▲ Howard-Yana Shapiro, Mars Global Staff Officer of Plant Science and External Research, in Muis's nursery.

selecting varieties that give the highest yields and the best disease resistance, we've been exploring the sort of institutional arrangements you need to transfer appropriate technologies and spread good practice."

The experience in Indonesia, described in the following pages, provides valuable lessons for other parts of the world. In 2010, Mars invited the World Agroforestry Centre to help implement its Vision for Change programme in Côte d'Ivoire. The aim there, as in Indonesia, is to ensure that cocoa becomes a 'tree for change.' If it does, then hundreds of thousands of farming families will benefit, and so will the cocoa industry and the growing number of chocolate consumers around the world.



A village cocoa clinic producing 28,000 clonal seedlings a year can yield a profit of over US\$10,000 for its owner.



Mars field coordinator Hussin bin Purung, seen here at a training session in Aceh, has had a major influence on cocoa production in Sulawesi and beyond.

1: SEARCHING FOR A SOLUTION

During the late 1990s, the re-emergence of the cocoa pod borer as a major pest led to a dramatic decline in yields in Indonesia. A moth, *Conopomorpha cramerella*, reduced the cocoa harvest by around 40% and Mars realized that urgent action was needed if the industry was to survive. The Pest Reduction and Integrated Management (PRIMA) project, funded by the Netherlands Ministry of Foreign Affairs and launched by Mars in Sulawesi in 2003, was to have a major influence on research and extension over the coming years.

The project's success, and influence, owes much to Mars field coordinator Hussin bin Purung. Hussin is renowned for his knowledge about cocoa and the measures needed to improve its health and productivity, and in collaboration with his colleagues in Indonesia he has worked out the most effective ways of introducing new technologies and practices.

"We chose the area around Noling, in South Sulawesi, as the place to launch PRIMA because the farmers here had so many problems," he recalls. They were suffering heavy losses caused by pests and diseases, their beans were of poor quality and their trees were old. Hussin identified 743 farmers with around 1000 ha of contiguous cocoa gardens and divided the area into eight zones, placing field



▲ Early work by Mars in Sulawesi focused on reducing losses caused by pests and diseases.

staff in each. Their task was to encourage farmers to adopt practices which would reduce losses to the cocoa pod borer and improve yields.

As you drive along the dirt street which runs through the village of Kambori, near Noling, you pass half a dozen wooden houses with private nurseries, each with many thousands of cocoa seedlings for sale. One of the largest belongs to 45-year-old Haji Malle, who was among the first wave of PRIMA farmers. He now gets over 2.5 tonnes of cocoa per hectare on his own land and makes a significant income from growing high-quality clonal seedlings.

“Around 20 years ago, we used to get reasonable yields,” he explains as he shows us around his cocoa garden. “But by the time Hussin arrived, the cocoa pod borer was causing terrible damage.” Thanks to the activities of PRIMA, farmers have significantly reduced their losses to the pest. They have done this by adopting the ‘good agricultural practices’ promoted by PRIMA.

These involve pruning, good sanitation, frequent harvesting, the use of fertilizers at the rate of 1–1.2 tonnes per hectare per year and spraying 10 times a year with the appropriate insecticides. (See Box 1: Outwitting the enemy)

François Ruf, an economist with the Centre de coopération internationale en recherche agronomique pour le développement (CIRAD), points out



▲ Collaborative research has focused on developing high-yielding clones with good resistance to pests like the cocoa pod borer.

that farmers were already applying fertilizers in the 1990s, at around 500 to 600 kg/ha, and harvesting their crops frequently. He speculates that this may explain why their trees were exhausted after 15 to 20 years.

However, he agrees that the real transformation and increase in productivity has come through the use of higher-yielding varieties of cocoa. “We found that by introducing good agricultural practices, farmers could increase their yields by around 30%,” says Hussin. “But what really made a difference was the introduction of high-quality clonal material.”

When PRIMA was launched, there were no plans to replace ageing trees with vigorous, high-yielding varieties, but Hussin soon recognized this should be a priority. A comprehensive programme of research, initiated during PRIMA and continuing today, focused on identifying the varieties which give the best yields and greatest resistance to disease. The researchers were also looking for clonal trees of small stature, as it is much easier to manage pests and diseases on short trees than it is on tall trees. By replacing old trees with short, high-yielding varieties, or by grafting budwood from superior varieties onto old trees, farmers have been able to double or triple their yields.

Ruf believes that the work conducted by Mars on the rehabilitation of old cocoa gardens has been highly significant. “Historically, replanting and rehabilitation has not had much success, because of a range of biological and social problems,” he says. Among other things, it has proved difficult to rehabilitate cocoa gardens on exhausted soils.

“In Sulawesi,” continues Ruf, “Hussin and his team managed to bring about successful rehabilitation on a large scale for the first time.” He believes that Hussin benefited greatly from his experience in Malaysia – he was brought up on a large and progressive

cocoa estate – before he moved to Indonesia. His experience has been matched by an unusual talent. In 2009, Ruf and Yoddang, his assistant, described the work conducted by Hussin and an Indonesian ‘peasant innovator’, Muhtar (after whom one of the best known cocoa clones is named), in *Grain de Sel*, a French magazine which focuses on rural development. They wrote: “If the Nobel Prize existed for agricultural innovation it would have to be given to those rare individuals like Muhtar and Hussin Puring who are too frequently forgotten in the history of development.”

Ruf believes that another factor also underpinned the success of cocoa rehabilitation, and that was the involvement of Mars. “The fact that the company decided to get involved in cocoa development, as well as buying and processing, was important,” he says. “In many ways, they are more efficient than most large government institutions.”

Recognizing the right to fail

“As a scientist, I hadn’t given much thought to the business of how to transfer technology and new ideas to farmers,” says Smilja Lambert, the Mars Cocoa Sustainability Research Manager for Asia and the Pacific, “but it wasn’t long before we realized that doing research on how to



▲ Haji Malle was one of the first farmers to set up his own budwood garden and demonstration plot.

control pests and improve yields was just the first step. In many ways, the most difficult task was getting farmers to change the way they farmed.”

During the early stages of the project, Mars provided support for a network of nurseries and demonstration sites. These were initially run by farmers’ groups, rather than by individuals. “Farmers were full of enthusiasm at first, but that didn’t last long,” explains Hussin. “They’d say they were too busy to get away from their own plots to water the seedlings or do other tasks, and we eventually realized the group approach wasn’t going to work.” Instead, Mars decided to encourage farmers to become entrepreneurs.

“We began to see that it made sense to provide support to carefully selected individuals, rather than farmers’ groups,” says Hussin. Haji Malle was one of the first farmers to set up his own budwood garden and demonstration plot and he swiftly established a thriving business. Many others were to do the same over the coming years. By 2010, 370 cocoa farmers trained by Mars and its partners in Sulawesi, Flores and Papua were managing 458 nurseries. During the year they sold around 4 million clonal seedlings, with many farmers earning over US\$ 3500 from their nurseries.

“PRIMA completely changed our lives,” says Haji. The profits from his cocoa gardens and nursery have enabled him to expand his house, set up a small shop and pay



▲ A small private nursery.

for his children to go to school in Makassar, the provincial capital, where he believes they will get a better education. In the old days, he and his wife used to have to walk to the market. Now, they go on his new motorbike.

Joseph-Yossi Toledano believes that many development projects suffer from a short lifecycle and a fear of failure. This means project managers are often unwilling to take risks. “We have made the decision that we are here for the long term, and we are always testing new ideas,” he says. “We accept that some of them will fail. That was the case with the group approach to demonstration plots. We also tested out various forms of disease control which didn’t work. It’s very important to know that you have the right to fail – otherwise, you’ll never know what works best, and what doesn’t.”

Despite the teething problems experienced by PRIMA, its significance was soon recognized far beyond Noling. The government extension service brought hundreds of farmers on study tours and PRIMA’s activities were extended to 432 farmers in Pongo village, North Luwu Regency. They rehabilitated their cocoa gardens by grafting short, high-yielding clonal material onto their old trees. The adoption of good farming practices, and a spraying regime devised by Lambert and her colleagues, reduced losses to the cocoa pod borer. Cocoa yields increased, and so did their incomes.



▲ Businessman Haji Rashid recently established his own cocoa nursery and he is now replanting two hectares with clonal seedlings.

An analysis of cocoa yields under different forms of management reveals just how much difference good agricultural practices can make. Mars scientists used different management options under experimental conditions. The control plot involves what amounts to business as usual; in other words, farmers do not use pesticides or fertilizers or adopt any of the practices recommended by Mars. At the other extreme, the cocoa garden is rehabilitated by grafting old trees with good clonal material and adopting good agricultural practices. The difference in performance is striking.

The total cost of management for the control plot comes to US\$ 65 per hectare, compared to US\$ 800 per hectare for the cocoa under best practice. This figure includes US\$ 320 for fertilizer, US\$ 87 for insecticides and US\$ 312 for labour (compared to just US\$ 44 for labour in the control plot). The yield for the control plot is 350 kg/ha/year; this compares to 2081 kg/ha/year under best practice. Profits for the control plot amount to US\$ 694 a year, compared to US\$ 3725 under best practice. “Of course, these are the extremes, and not all farmers will manage to achieve such high productivity,” says Lambert. Nevertheless, increasing numbers of smallholder farmers in Indonesia are getting 2 tonnes/ha/year or more now.

By 2006, over 1150 farming families had benefited directly from PRIMA. The key question now was: how could Mars and its partners scale up activities to benefit tens of thousands, rather than just hundreds, of farmers?

Outwitting the enemy



Smilja Lambert and her colleagues at Mars have explored a range of strategies to tackle the cocoa pod borer, whose depredations have reduced the cocoa harvest in Indonesia by approximately 40% over the past decade. As a result, the country's 500,000 cocoa farmers are losing approximately US\$ 1 billion a year.

The best method of control involves placing each pod in a polythene sleeve. This has proved highly successful in the Philippines, but has found little favour among

farmers in Sulawesi as many cocoa trees are too tall to put sleeves on the pods. However, the researchers have found that losses to the cocoa pod borer can be reduced from 40% to around 10% by using 10 applications of a pyrethroid-based insecticide. This target spraying regime, combined with good farm management, has been adopted by most of the farmers who have received training from Mars and its field facilitators. The farmers have also learnt about the rational, efficient, minimal and safe use of insecticides.

Just as importantly, Mars, the Indonesian Coffee and Cocoa Research Institute (ICCRI), the Australian Centre for International Agricultural Research (ACIAR) and several other organizations are collaborating in the screening, breeding and selection of high-yielding and pest- and disease-resistant varieties. More than 300 superior cocoa trees, identified by cocoa farmers, were tested in field trials and the 20 best clones are now being more rigorously evaluated. Some have proved to be particularly productive; others have shown good resistance to the cocoa pod borer. The Mars breeding team has performed crosses between high-yielding and disease-resistant clones in the hope of combining their best characteristics.



Some of the many cocoa varieties in Sulawesi on display at the Mars Cocoa Development Centre in Palopo.

2: CREATING CENTRES OF EXCELLENCE

One of the first things you notice when you enter the Mars Cocoa Development Centre (MCDC) in Palopo is a large board with a colourful map indicating the position of nurseries, budwood gardens, clonal trials, offices and so forth. Ranged around the map are the logos and names of 48 different organizations.

“That’s what this is all about,” says Howard Shapiro. “It’s about uncommon collaborations.” Everyone seems to be represented here: government agencies, research institutes, non-governmental organizations (NGOs), cocoa buyers and grinders, international donors, local government departments, Mars, business competitors of Mars...

The seeds of this uncommon collaboration were sown in 2005, when Mars and the International Finance Corporation (IFC), the private-sector financing arm of the World Bank, convened a meeting to discuss the future of the cocoa industry in Indonesia. It was clear that none of the existing programmes, including PRIMA, was capable of solving all the problems facing the industry. What was needed was a joint effort: hence the creation of the Cocoa Sustainability Partnership (CSP).



▲ Building blocks to a better life – the tools farmers need to establish a cocoa nursery.

Members of the partnership meet at regular intervals to share information, coordinate their activities and make sure that the people who really matter – Indonesia’s cocoa farmers – receive the best possible advice and technical help. Mars is primarily involved in areas of technology development and transfer. Cocoa development centres, such as the one at Palopo, are at the heart of these activities.

During the PRIMA project, Mars established a number of ‘outreach stations’. These were mostly small plots where field facilitators were able to demonstrate best practice, in terms of pruning, disease control and the use of fertilizers, and the virtues of rehabilitating old cocoa gardens using superior genetic material. However, it soon became apparent that something else was needed.

“We realized that our interventions were rather scattered,” explains Peter van Grinsven, Mars Cocoa Sustainability Director. “We decided that we needed to establish a centre of excellence, at one site in South Sulawesi, where we could showcase everything we were doing to improve cocoa production and the livelihoods of cocoa farmers.” He adds that one of the best strategic moves the company made was to allow people like Hussin the freedom to follow through on their ideas – such as the cocoa development centres – and remove any obstacles in their path.



▲ A year in the life of an experimental plot, named after Mars scientist Smilja Lambert.

The first Mars Cocoa Development Centre (MCDC) was established in the Philippines, near Davao City, in 2007; this was the company's main contribution to the work of the Sustainable Cocoa Enterprise Solutions for Smallholders (SUCCESS) Alliance. The following year, Sulawesi's first MCDC was established in Palopo on land provided by the mayor. Managed by Mars, the centre's activities are conducted in collaboration with the local extension services and members of the Cocoa Sustainability Partnership.

Farmers, extension staff, field facilitators and trainers come to the MCDC to learn about a wide range of activities. Here, they can see demonstrations on the use of superior planting materials, the best methods of rehabilitating old cocoa gardens, different methods of disease and pest management, and post-harvest practices which enable farmers to produce high-quality cocoa. Cocoa development centres are also important research sites, where scientists conduct clonal trials, test different types of pest management and explore the best methods of technology transfer.

Seeing is believing

During the 1980s, the area under cocoa expanded rapidly in Sulawesi, despite the fact that prices on the world market remained low for a long period of time. In remote areas of Indonesia, farmers favoured cocoa beans over perishable crops which were more difficult to transport. Low taxes meant that they were able to buy inputs required to improve production. They were getting higher yields than the African farmers with whom they competed on the world market, and were able to make a good living from cocoa.



▲ Mars scientists Lambert and Shapiro visit a cocoa farm belonging to Haji Hassan of Cendana Hijau Larol village.

Haji Hassan of Cendana Hijau Larol village, North East Luwu Regency, was one of many farmers who cleared forest and replanted his land with cocoa. For the next decade, his trees performed well, yielding over 1 t/ha. However, in 1997 the cocoa pod borer arrived in this area and within two years was causing huge problems. “It just got worse and worse,” he recalls. The amount of cocoa he could harvest declined, and so did his profits.

One day a field facilitator from Mars told Haji that he could use a technique known as side grafting to rehabilitate his cocoa gardens. “I thought the whole idea sounded stupid,” recalls Haji. “I’d seen someone try this before and it hadn’t worked.” The field facilitator insisted that Haji accompany him to a demonstration site nearby. Here, the virtues of side grafting were plain to see. In August 2009, with the help of 15 neighbours, Haji grafted superior clonal material onto 0.5 ha of old cocoa trees. By late 2010, the grafts had taken so well, and the trees were so healthy, that he was anticipating future annual harvests of around 2 t/ha.

“I never imagined it would be like this,” he says, surveying his handiwork with pride. In fact, he has become so enthusiastic about rehabilitation that he has begun travelling beyond his community to convince other farmers they should do likewise. “It isn’t easy to rehabilitate old cocoa gardens,” he reflects. “It’s like bringing up a child. You have to take good care of it, but it’s worth the effort.”



▲ Muh Syarif, a cocoa trader, at his shop in Lera village.

In November 2010, Hussin organized an awards ceremony in Palopo for the best village cocoa doctors in Sulawesi and Flores. One of the three winners was Slamet Hermanto from Poso. He said that if it hadn't been for Mars, he and his neighbours would still be planting local varieties of cocoa, rather than higher-yielding clones. But getting farmers to change their ways hadn't been easy. "When we first offered to provide training to farmers in grafting and the use of new clones, they refused," he explained. "It was only after we'd set up a Village Cocoa Clinic that they changed their minds – because seeing is believing."

The importance of demonstrating good practice cannot be overstated. Take, for example, the story of Muh Syarif, a cocoa trader in Lera village, East Luwu Regency. In 2007, he bought a hectare of abandoned cocoa farm and began grafting superior varieties onto the old trees after visiting the Mars PRIMA outreach station. He is now getting over 3 tonnes per hectare and has used some of his profits to buy and rehabilitate other cocoa gardens. His farm is now being used as a learning site for farmers from Sulawesi and other provinces.

Much of the seeing, and believing, is done at the Village Cocoa Clinics (VCCs) run by farmers like Slamet and Muis Samsuddin, who was also presented with a winner's award at the ceremony in Palopo. "The VCCs are businesses in their own right, providing an income for the farmers who run them," explains Hussin. "But they are also superb demonstration sites where farmers can see best practice, buy superior varieties and get advice."

By the end of 2010, there were 16 VCCs in Sulawesi and 10 in other Indonesian provinces. A further 15 were planned for 2011. Each is owned and managed by a village cocoa doctor trained by Mars at one its MCDCs. Mars provides them with a package of 100 clonal seedlings of 10 different varieties, budwood for grafting,

polythene bags and some basic equipment. It costs around US\$ 400 to establish a VCC but some cocoa doctors have managed for less. Muis, for example, set his clinic up with a loan of US\$ 200 from his family.

Muis grew 5000 seedlings for sale in 2008, 10,000 in 2009 and 32,000 in 2010. He now sells seedlings for 4500 rupiah (US\$ 0.50), which leaves him with a profit of 2250 rupiah (US\$ 0.25) each. During 2010, he shared the profits with a cousin, but still made US\$ 8000 – a huge sum of money in rural Indonesia. He has also taken his skills beyond his cocoa clinic into the surrounding countryside, where farmers hire him to rehabilitate their cocoa gardens. (See Box 2: Money matters)

Hussin estimates that each village cocoa doctor serves up to 170 farmers. It is a model that has been widely adopted by NGOs such as Swisscontact and Mercy Corps, and it is appreciated by government extension services. “The VCCs are an excellent way of promoting good practice,” says Burhanudin Mustafa. As head of the Estate Crops Department in South Sulawesi, he is in charge of an ambitious government programme, known by its Indonesian acronym, GERNAS, designed to increase cocoa production in Indonesia.

Mars has pledged that by 2020 it will only buy third-party certified sustainable cocoa, and South Sulawesi has been the



▲ Village cocoa clinics such as this one serve up to 170 farmers each.

focus of its pioneering activities. Mars Symbioscience, an Indonesian Mars business, began intensive certification activities in 2009 and it organized a workshop to develop national Indonesian criteria for certification. By the end of 2010, 1200 ha of cocoa gardens were certified as being sustainably managed. The target for 2011 is 4000 ha. The company is working with the Rainforest Alliance and UTZ Certified to devise 'standard practices' for Indonesian cocoa farmers who wish to join certification schemes. The schemes provide a premium as an incentive to adopt sustainable practices which are not only good for the environment, but guarantee higher yields for farmers. "Certification is about setting a course for the future, not just about buying beans with a stamp on them so we feel good about it," says Shapiro.



Money matters

Village Cocoa Clinics (VCCs) are businesses, as well as demonstration sites where farmers can seek advice. The most ambitious model – Mars refers to it as the ‘Sulawesi model’ – involves the development of three nurseries: one during the first year with a capacity of 1000 clonal seedlings; another in the second year with a capacity of 5000 clonal seedlings; and the largest, established in the third year, with a capacity of 10,000 seedlings. By the fifth year, the VCCs will produce around 28,000 clonal seedlings, yielding a profit of approximately US\$ 10,700.

A more modest option, which might well be appropriate for Côte d’Ivoire, where the World Agroforestry Centre is establishing cocoa development centres and VCCs for Mars, involves the creation of small and medium-size nurseries, producing 10,500 clonal seedlings a year. In Sulawesi, VCCs of this size earn the village cocoa doctor over US\$ 5000 a year.



Syafei, headmaster at Bone Bone College, in a demonstration plot used by students.

3: CHANGING MINDS, CHANGING LIVES

In many parts of the cocoa-growing world, the young don't want to remain on their family farms, and with good reason. Having seen their parents struggle with low harvests and meagre incomes, they head to the cities in search of work. However, South Sulawesi is bucking the trend. Many young people are choosing to work on their parents' cocoa farms, or establish their own. Over the last few years, they have begun to see that it makes financial sense to stay, rather than leave.

Farmers' children are also taking advantage of new opportunities in education. Cocoa studies are now on the syllabus at five out of the 22 Sekolah Menengah Kejuruan Negeri (SMKN), or vocational colleges, in South Sulawesi and at Hassanudin Polytechnic in Pangkep, thanks to support provided by Mars. "We want young people to see that taking on family farms is a viable alternative to leaving for the cities," says Ian Pople, Mars Symbioscience Country Manager.

Mars first began to work with the vocational colleges in 2007 after Hussin had given a presentation to staff at Bone Bone SMKN, in North Luwu Regency. At the time, there were just 200 students at Bone Bone, seven of whom were studying agriculture. After the presentation, the headmaster asked Hussin to write the curriculum for a new cocoa course and provide training for teachers. The timing was propitious as the Government of Indonesia was



▲ In 2010, 240 students at Bone Bone chose cocoa as their specialist subject. Some will go on to become trainers and extension workers.

keen to support and expand vocational training. The growth of Bone Bone has been astonishing. By 2010, there were 1290 students and over 80 staff. Of the 300 16–19 year olds studying agriculture, 240 had chosen cocoa as their specialist subject.

“One of the reasons the course is so popular is because cocoa is such an important crop for the economy and most students come from cocoa-farming families,” explains Syafei, the headmaster, as he takes us on a tour of the college nursery. Besides the coursework, students spend 3–4 months in the field, lodging with farmers and village cocoa doctors and helping them in their daily work. They also run a cocoa clinic established by the college to supply services and materials to local farmers. The profits from the clinic and the college nursery have already helped to pay for the building of new classrooms. The students’ parents have benefited too. By November 2010, 62 of the 92 students in their final year of cocoa studies had established budwood gardens growing superior varieties on their family farms.

Some students will return home once their training is finished. Some will go on to study agriculture at university; others will become field facilitators for Mars and NGOs working with cocoa farmers. “We see colleges like this as prime suppliers of field facilitators,” says Pople.



▲ Students at Bone Bone vocational college. The poster reads, ‘Women are the farmers of today’.

During the PRIMA project, Hussin had a team of 12 field facilitators, whom he trained himself. There are now 25 field facilitators in South Sulawesi who report to Mars, and their number will increase over the coming years. By the end of 2010, Mars and its partners had provided training in cocoa production to over 40,000 farmers, with the field facilitators playing a key role. Hussin and his staff had also trained 135 government extension officers and 279 individuals who provide training to cocoa farmers. Besides receiving training on how to improve their cocoa gardens, some farmers have benefited from specific sessions on activities such as composting.

Hussin stresses that there is more to training farmers than providing technical skills. “First of all, you need to establish a relationship,” he says. “I think of farmers as my brothers. It’s only once I’ve established a relationship that I start providing them with the practical skills they need.” This is one of the reasons why he goes to considerable care selecting his field staff. “They need to have heart and spirit, as well as technical ability, because what we’re trying to do is change the farmers’ mindset.”

Prior to launching its training programmes in the field, Mars pays great attention to what Hussin describes as socialization.



▲ It's a family business. Filling polythene bags for cocoa rootstock at a village cocoa clinic.

“First of all,” he says, “we make a presentation about our intentions to the government extension agencies, the district officers, and the heads of villages and sub-villages. We tell them who we are, what we would like to do, and why we want to do it.” Once those present have agreed in principle to the idea of Mars and its partners conducting training sessions, the district officers will issue a letter which goes to the mayor, to seek his or her approval, and to village leaders. When everybody has been consulted, and consented to the trainings, the latter call a farmers’ meeting, frequently held in a mosque or a church.

In the case of the PRIMA project, Hussin hired temporary staff to conduct a survey after he had completed the initial socialization. This provided detailed insights into each farm and the way farmers were managing, or mismanaging, their cocoa. After the survey was completed, the training began. The experience here provided a model which Mars and its partners have adopted elsewhere, in Sulawesi and beyond. The key to success, says Hussin, is thoroughness, patience and long-term commitment.



Farmers in Papua are now benefiting from the expertise developed by Mars and its partners in Sulawesi and other parts of Indonesia.

4: TO PAPUA AND BEYOND

The model of training and extension developed by Mars in Sulawesi has been enthusiastically adopted by other organizations in Indonesia, such as the Swiss Foundation for Technical Cooperation (Swisscontact), which promotes private sector economic and social development. Swisscontact has benefited from the technical support of Mars in Flores and Aceh province.

Hussin and his colleagues trained 114 field facilitators in Flores and they provided technical support to Swisscontact's PEKA project in Aceh. This is part of the Government of Aceh's Economic Development Financing Facility, whose aim is to increase income and job creation in the cocoa sector. The five district cocoa centres supported by Swisscontact in Aceh are based on the MCDC model established by Mars in Sulawesi. The two-year project will directly benefit some 12,500 cocoa farmers, significantly increase cocoa production and create over 200 new jobs.

By the end of 2010, there were five Mars Cocoa Development Centres, one in the Philippines, two in Sulawesi and two in Papua. Peter van Grinsven, Mars Cocoa Sustainability Director – Origins and Operations, says that he did not fully realize how important the centres were until a mission funded by the International Fund for Agricultural Development (IFAD) provided an analysis of their achievements. "I'm still rather surprised by how well the centres have worked, and I wish we had started to build on their potential at an earlier stage," he reflects.



▲ Learning to graft at the Mars Cocoa Development Centre in Alang Alang, Papua.

In 2008, Joseph-Yossi Toledano met staff from IFAD in Jakarta and later visited the organization's headquarters in Rome. They discussed a US\$ 10.5 million livelihoods programme which IFAD was funding as part of the National Programme for Community Empowerment in Papua and West Papua. "We argued that cocoa was very important to farmers in the province and that much could be done to improve productivity and incomes," says Toledano. "If local communities aren't encouraged to increase their incomes, they'll wait for projects that provide them with some form of subsidy."

IFAD was keen to discuss projects which could benefit small-scale farmers in Papua and West Papua. "The farmers there are very poor and have little or no engagement with markets," says Youqiong Wang, IFAD's Country Programme Manager for Indonesia in Asia and the Pacific Division. "We realized that this was an important cocoa growing area, but productivity was very low and so was the quality of the cocoa beans."

Yields were much lower than in Sulawesi, at around 350 kg per hectare, and farmers had little or no access to high-quality planting material. Furthermore, many of the cocoa gardens were over 25 years old and neglected. Toledano told Wang and his colleagues about the work they had been doing in Sulawesi and the sort of institutional arrangements Mars had established there. It was agreed that the company would fund the development of two MCDCs in Papua; if these were a success, IFAD would consider providing funds to develop similar activities elsewhere in the province.

Initially, central government was wary about the involvement of a private company. "We had to explain that Mars was investing in public goods to benefit the whole cocoa industry, not just for itself," recalls Wang. However, both central and provincial government gave their blessing, and Wang and Toledano visited Papua with some colleagues in August 2008. They identified the site for the first MCDC in Papua, and this was formally opened by the Provincial Governor, a keen supporter of the project.

Wang returned to the MCDC in Alang Alang village at the end of 2009, two months after the official launch. “The centre was working very well,” he recalls. “It was attracting a lot of the local cocoa producers, as it was providing the skills and technology they were looking for, and farmers were spreading the message about how they could improve their cocoa gardens.”

The MCDC has also been used as a demonstration site for integrated pest and disease management as part of a project funded by the Australian Centre for International Agricultural Research (ACIAR). In 2010, 17 agriculture facilitators received training in a range of agricultural issues, including the management of cocoa, and they are now helping to train a cadre of ‘barefoot agriculturalists’, farmers who will go back to their villages and train other farmers. More facilitators will be trained in 2011.

Wang’s positive impressions were confirmed by an evaluation mission to Papua in February 2010. “The mission regards the MCDC as a very valuable asset to the cocoa farmers of Papua,” concluded the authors. The centre, they noted, was ideally placed to support the training of village extension workers and local farmers. According to the mission, the model of technology transfer developed by Mars in Sulawesi was the only “long-term sustainable methodology” capable of addressing the problems facing cocoa farmers in Papua.



The evaluation suggested how a ‘smallholder extension model’, based on these activities, could be introduced to other parts of Papua. The aim would be to double cocoa yields, support the establishment of 70 village cocoa clinics and encourage the rehabilitation of 3500 hectares of old cocoa gardens. At the time of writing (March 2011), the central and provincial governments were yet to organize a workshop with all concerned to validate the evaluation report. However, Wang confirms that if and when they do, IFAD will be happy to invest in these sorts of activities in Papua and West Papua.

While the MCDC at Alang Alang, which serves an immigrant population, has been very successful, with many farmers adopting the new technologies, the other MCDC in Papua needs additional stimulus to drive significant levels of uptake of ‘good agricultural practices’ among the indigenous community for whom it was established. This underscores the importance of maintaining a long-term presence and packaging interventions in ways that suit the cultural and social environment.

Next stop: Côte d’Ivoire

“The cocoa development centres in Papua provide the best model of what we hope to achieve with the World Agroforestry Centre in Côte d’Ivoire,” says Toledano, who is managing the Mars Vision for Change programme in Côte d’Ivoire. “In Papua, this was never a question of the private sector parachuting in its own operation. We provided the funds for MCDCs, but we worked very closely with the government. The World Agroforestry Centre will be doing the same thing in Côte d’Ivoire, on a larger scale, with the *Comités de gestion de la filière café-cacao* [Cocoa Sector Management Committee].”

In 2010, Mars Inc launched a major public-private partnership – known as Vision for Change – whose ultimate aim is to revive the cocoa industry in Côte d’Ivoire, the world’s largest producer, and improve the livelihoods of the country’s farmers. Focusing on the cocoa-producing region of Soubré, the project seeks to increase yields from an average

of around 400 kg to 1500 kg per hectare or more. This will be done by rehabilitating old cocoa gardens, using improved sources of germplasm, and encouraging best agricultural practices.

The World Agroforestry Centre and Mars are building on a relationship which began several years earlier in West Africa. “Howard Shapiro and his colleagues have always valued research,” says Tony Simons, who was appointed Director General of the World Agroforestry Centre in 2011. “Mars also places a strong emphasis on forming creative partnerships with research organizations, government agencies and other private companies.”

In 2004, Mars and Unilever co-funded a project to domesticate *Allanblackia*, an African tree whose seeds contain an oil with unique properties. The project, managed by the World Agroforestry Centre, is described in another ‘Trees for Change’ booklet, *Seeds of Hope*. Since then, Mars has instigated a series of events – including a major international conference, held in Accra, Ghana in 2008 – which have focused on the rehabilitation of the West African cocoa industry. These have led to what Shapiro describes as a new model of public-private partnership, involving Mars and the World Agroforestry Centre.

The Vision for Change programme was officially launched in 2010, not long before Côte d’Ivoire was plunged into crisis. Following disputed elections in November, there was a period of intense fighting, a great exodus of refugees and the temporary paralysis of the cocoa industry. Despite these problems, 13 technicians – nine employed by the World Agroforestry Centre, two from the Centre National pour la Recherche Agronomique (CNRA) and two from the Agence National d’Appui au Developpement Rural (ANADER) – travelled to Sulawesi in 2011 for a training programme. The technicians learnt about grafting, disease management and good agricultural practices. Considering the turmoil in their country, their dedication was astonishing.

Prior to the technicians' visit, the World Agroforestry Centre's project manager in Côte d'Ivoire, Christophe Kouame, also visited Hussin and his team in Sulawesi. "I was amazed by the cocoa gardens," he reflects. "In Sulawesi, you see lots of small cocoa trees covered with pods – something you hardly ever see in Côte d'Ivoire. We aim to achieve the same thing in our country over the coming years."

In 2010, Kouame and his staff established two cocoa development centres (CDCs) in Soubré, each of which will serve a network of *Centres Villageoises de Cacaoculture*, equivalent to Indonesia's Village Cocoa Clinics. Here, farmers, extension workers, policymakers and others can see what the programme intends to achieve. At each centre, there are budwood gardens, nurseries for hybrid seedlings and demonstrations on rehabilitation, grafting, pruning, the use of fertilizers and fermentation. To reach 150,000–200,000 farmers in Soubré, the Vision for Change programme will need to establish 75–100 CDCs, each of which will support up to 20 *Centres Villageoises de Cacaoculture*.

When the project was first proposed, it was suspected that Mars and its partners wanted to increase production in order to reduce prices. "We had to convince them that this wasn't the case," says Simons. At present, farmers have an average of 3 hectares each, with yields of around 400 kg per hectare. "If we can push yields up to 1000 kg per hectare, then farmers could produce the same amount of cocoa on just over a third of their land. They could then devote the rest of their land to timber, fruit and other crops."

Drawing on the experience in Indonesia, the partnership aims to transform the landscape. It will not only improve cocoa productivity, but also encourage farmers to plant a mosaic of different crops and restore a degraded environment. This should dramatically improve the welfare of rural communities, and ensure that Mars and its competitors have a high-quality supply of the raw material they need to prosper in future.

Acknowledgements

A great many people provided help and information during the writing and research of this booklet. Particular thanks go to the staff at Mars, Incorporated. Special mention should be made of Smilja Lambert, Hussin bin Purung, Howard Yana-Shapiro and Yossi Toledano. Ian Pople and Noel Janetski, both of Mars Symbioscience Indonesia, provided a local perspective, while Peter van Grinsven, Mars Cocoa Sustainability Director, provided a global view. Thanks also to François Ruf of the Centre de coopération internationale en recherche agronomique pour le développement (CIRAD), Youqiong Wang of the International Fund for Agricultural Development (IFAD), Manfred Borer of the Swiss Foundation for Technical Cooperation, and Tony Simons and Christophe Kouame of the World Agroforestry Centre. I would also like to thank the many farmers, extension workers and government officials who were so generous with their time in the field.

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ISBN 978-92-9059-300-3

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