

# Enabling more secure livelihoods in uncertain times



Cam McDonald (left), Monica van Wensveen and Jeff Corfield compare notes during a visit to a farmer who has established a nursery to provide plants and cuttings for a new forage system in the Sulawesi village of Lemoa.

The greatest challenge facing smallholder farmers in eastern Indonesia is the limited range of reliable and profitable farming options for their small plots of land. **Gio Braidotti** reports how an ACIAR-funded project is helping these farmers change the way they manage cattle to reduce the vulnerability of their farms and livelihoods

**T**he farms around SPA village on Sumbawa island are remarkably similar in appearance: three hectares of land divided between three farming activities. Rice is grown on rain-fed lowland fields during the wet season, followed by maize, sweet potato or peanuts. An upland field is planted with tree and cash crops and used to provide feed for cattle. Behind each house in the village is a home garden planted with chilli, fruits and vegetables and home to shelters for cattle, chicken and ducks.

This uniformity comes from central planning—many villages like SPA were created in the 1970s and 1980s as part of the Indonesian Government's transmigration program, which moved people from densely populated islands, such as Java, to less developed areas like Sumbawa.

Of the three land uses, it is cultivation of rice that underpins household food security. It is difficult to overstate the importance of rice in Indonesia and the social impact that it has for farmers. Rice makes up about 40% of Indonesia's total harvested crop area and

accounts for about half of people's caloric and protein intake. On remote Sumbawa, in the absence of farm machinery and with unreliable rainfall, rice cultivation is a labour-intensive and increasingly risk-prone crop. Over the past six years, farmers have struggled to harvest one crop in three.

In these circumstances, cattle are the main safety net, kept so they can be sold when times are tough or for big expenses such as renovations or education. Yet the opportunities for farm profit are greater from cattle than from farming rice. In Sumbawa, as throughout eastern Indonesia, the most common breed is the hardy, small Sapi Bali.

Demand for beef in Indonesia has increased strongly on the back of a growing urban middle class, but Sapi Bali numbers have steadily declined over the past decade as smallholders have had to sell cattle to get through hard times. While imports close the supply gap, smallholders are missing out on a strong market opportunity. However, making the transition from keeping cattle as a form of livelihood insurance to managing cattle as

a productive and profitable small enterprise is not easy. With financial support from an ACIAR-funded project, a team of Indonesian and Australian researchers is helping introduce changes to the management of cattle.

## UNDERSTANDING THE FARMING SYSTEM

Before attempting to provide any kind of advice, the joint Indonesian–Australian team sought to better understand the farming system. Leading the Australian team is Dr Shaun Lisson from CSIRO Sustainable Ecosystems. "We needed to understand the key constraints to livestock production across the whole farming system, taking into account biophysical characteristics—like soil, climate, plants and cattle—and socioeconomic factors, such as farmer attitudes, labour availability, input costs and market prices," he says. "With the assistance of farm system models, we then attempted to identify 'best-bet' strategies to address these constraints which farmers could then evaluate in their fields."

Another project team member, CSIRO's Cam McDonald, explains the complexity of issues and choices farmers face. "There are interactions



As well as heading the forage team for the islands of Lombok and Sumbawa, Yusuf Sutaryono feels at ease approaching a Bali cow during an on-farm visit, while CSIRO's cattle expert Cam McDonald looks on.



CSIRO's Monica van Wensveen (left) is part of a follow-up ACIAR project to scale out livestock production innovations to thousands of farmers, assisted by Indonesian graduates Nurlaela (centre) and Sri Wahyuni (front right).

between the household and the farm, as well as flows of inputs and outputs from different production systems, and then there are the impacts of markets and the environment," he says. "In smallholder farming systems these are all closely integrated, making these farms remarkably complex despite their size."

Complicating these issues is the lack of

available land and the importance farmers place on crops as their main income source. "Most arable land is used for cropping and farmers are initially reluctant to plant forages for cows on good land, even if the food crop is not profitable," says Dr Dahlanuddin from the University of Mataram. "Farmers' first priority is to feed their family rather than cattle. That

means there is always an issue with the low quality and availability of feed for cattle, especially during the dry season."

To close the feed deficit, researchers and farmers initially evaluated the use of plants, such as tree legumes used for fencelines, and crop residues that were locally available but not being used to feed cattle. A traditional



#### PARTNER COUNTRY Indonesia

**PROJECT DESCRIPTIONS:** AS2/2004/004: Improving smallholder crop–livestock systems in eastern Indonesia; SMAR/2006/096: Scaling-up herd management strategies in crop–livestock systems in Lombok, Indonesia; SMAR/2006/061: Building capacity in the knowledge and adoption of Bali cattle improvement technology in South Sulawesi

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## Simple solutions to complex problems

Small farms, such as those around SPA village in Sumbawa, are centred on rice production, reflecting the importance of rice in Indonesian culture. The challenge for the joint Indonesian–Australian project team was to demonstrate how feeding cattle could benefit these farmers, and introduce the means for farmers to profit from this. For the team this meant understanding how the farmers think, and designing practices that were appealing to farmers involved in the project.

The project involved some 60 specialists and was built around the participation of innovative smallholders willing to trial alternative farming practices and build innovation capacity within their local agricultural economies by providing plant nurseries or access to bulls, and sharing technical advice with other farmers. Supporting them was a research network spanning three islands: Sulawesi, Lombok and Sumbawa. The Sulawesi component was headed by Mr Rachmat Rachman of the Assessment Institute for Agricultural Technology (BPTP); while in Nusa

Tenggara Barat (NTB), which encompasses the islands of Lombok and Sumbawa, leadership was provided by Dr Lalu Wirajawardi (also of BPTP). Also participating were the University of Mataram in Lombok, Hasanuddin University in Sulawesi and Dinas Peternakan, an Indonesian government agency that provides livestock extension and technical services to farmers.

One example of a simple, yet important, innovation introduced by the project team was a new use for the tape measure. Project leader Dr Shaun Lisson, of CSIRO Sustainable Ecosystems, says that buyers were offering farmers a price for their cattle based on an animal's estimated weight. "Unsurprisingly, the buyer's estimate is often less than the farmer's estimate. In the absence of scales, the farmers had no way to ensure a fair price." So the project team introduced a simple way of estimating cattle weight from girth measurement. This approach, used in other parts of Indonesia, is empowering the farmers to bargain for better prices for their cattle.

preference for native grasses meant the farmers had not considered using plants as a feed source for cattle.

“We had difficulty providing feed for cattle, but we did not know we already had good feeds in our village. What we lacked was knowledge,” says Amaq Kusmayadi, a farmer from the village of Mertak on neighbouring Lombok. “It is easy to own an animal, but without information on how to manage it you will lose that animal quickly.”

The project team identified a range of feeding options for farmers to evaluate in an action learning process. This included both local feed resources (crop residues from peanuts, rice and mungbean) and varieties of forage grasses and legumes new to the area. “We learnt that it is not enough to show farmers how to grow forages; we need to show them how to use these plants to get the best out of their animals,” says CSIRO forage expert Jeff Corfield.

Ultimately knowledge became the primary commodity exchanged in the project and Mr Corfield says it is valued as highly as increases

in income among the Indonesian farmers.

The forage work grew into the notion of a ‘feed budget’, in which knowledge about how much to feed each type of animal is leveraged against the availability of feed throughout the year. The result is a planning tool in the form of a feed calendar that helps farmers with seasonal livestock management choices.

“From the early assessments of livestock raising practices, we found that calving was occurring throughout the year, creating haphazard feed requirements,” says Mr Corfield’s Nusa Tenggara Barat (NTB) counterpart, Professor Yusuf Sutaryono from the University of Mataram. “The calendar allows farmers to start thinking about controlling calving dates around the availability of suitable feed for the lactating mothers and weaned calves.”

#### MORE PRODUCTIVE CATTLE

When the project team first started working in NTB, farmers were locked into low levels of productivity and profitability. They were interested in increasing the productivity of their cattle but not at the expense of land needed for

rice, cash crops or fruit and vegetables. The four years of project activities in the pilot villages have seen farms change dramatically. Not only have the 120 participating farmers allocated and expanded areas for growing forages for feed, they have made a major shift towards managing their cattle for market.

Farmer interviews held before the project commenced indicated that 50% of households did not raise cattle and were therefore exposed to high risk if their rice crop failed. After four years, almost all of the participating farmers are raising cattle and experiencing impacts that they could not have imagined at the start. Most farmers increased household income by 50–300% by selling cattle. Farms that previously could not maintain any cattle are now feeding as many as eight.

Overwhelmingly, the farmers used this extra income to invest in activities likely to reinforce economic gains (such as the building of small farm dams), improve their houses and provide better education for their children.

A profound but less tangible impact has been an increase in confidence and security among the farmers. They are adamant that working together to address problems and opportunities—the action learning approach—has opened new opportunities previously thought unachievable. “Agriculture is so difficult,” Amaq Kusmayadi says. “Participating in this project changed our lives. We compare experiences to improve our understanding and we feel a responsibility to pass on what we have learned to other farmers. It is important for us to share the benefits of this experience.” The farmers feel better equipped to address crises, such as crop failure, without ending up in a debt trap with moneylenders.

#### FROM HUNDREDS TO THOUSANDS OF FARMERS

ACIAR is already working with CSIRO to build on the successes to date. The original project was conducted on a pilot scale to identify the livestock-management options with the greatest potential to reduce the vulnerability of livelihoods to seasonal crises. CSIRO’s Monica van Wensveen, the Australian coordinator of the two new projects, says the challenge now is one of scale. “We want to reach as many farmers as possible, but need to understand the conditions that make for successful scale-out and adoption of the pilot outcomes.” The new projects funded by ACIAR are allowing the team to develop and evaluate approaches to expanding the local successes to thousands not hundreds of farmers and researching ways of overcoming barriers to adoption. ■



At the SPA village on the island of Sumbawa Australian project leader Dr Shaun Lisson (left) pays an on-farm visit to participating farmer Amaq Sapri.

(Below left and right) tree legumes, grown as fencelines, were not being used by farmers as a feed source for their cattle.



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