

Adaptation strategies provide better options for Indonesian farmers

Crop diversity, village food processing and kitchen gardens are some of the new approaches being trialled by small farmers and fishermen on the Indonesian islands of Lombok and Sumbawa to improve their livelihoods and prepare for the combined effects of climate change and population pressure.

The strategies and alternative enterprises are being investigated as part of a project to integrate climate change adaptation into rural development policies. The Indonesian Government sees the scenario planning approach which the project has developed in Nusa Tenggara Barat (NTB) province as a model for the whole country.

The Ministry for the Environment has introduced a 'Presidential Decree on Vulnerability, Risk Assessment and Adaptation Strategies for Climate Change' which includes the project's participatory method of combining downscaled climate projections, livelihood assessments and policy evaluation to identify vulnerable communities and appropriate adaptation strategies.

Results help set provincial development priorities

In partnership with United Nations World Food Programme (WFP), which has been working with the NTB provincial government on food security, the project team has developed an atlas of 106 rural sub-districts in the province and their relative vulnerability to future climate change and population growth issues.

WFP Climate Change Officer, Chandra Panjiwibowo said the CSIRO work had helped in setting priorities and developing plans for the province.

"We conducted an overlay analysis between our food security and vulnerability atlas, which represents a snapshot of people's food security

and CSIRO's analysis of impacts of climate change and population growth on livelihood condition," says Mr Panjiwibowo.

"This showed a strong consistency in the results for existing vulnerable areas and identified some sub-districts that need more urgent focus," he says.

Trialing alternative crops to offer a safer future

In Central Lombok the district government has trialled and is establishing alternative crops to tobacco, which is a very high risk dry season cash crop. In 2012, 15,000 tobacco growers in Lombok produced 30,000 tonnes of dry leaf but the tobacco companies bought only 24,000 tonnes, leaving many



Project snapshot

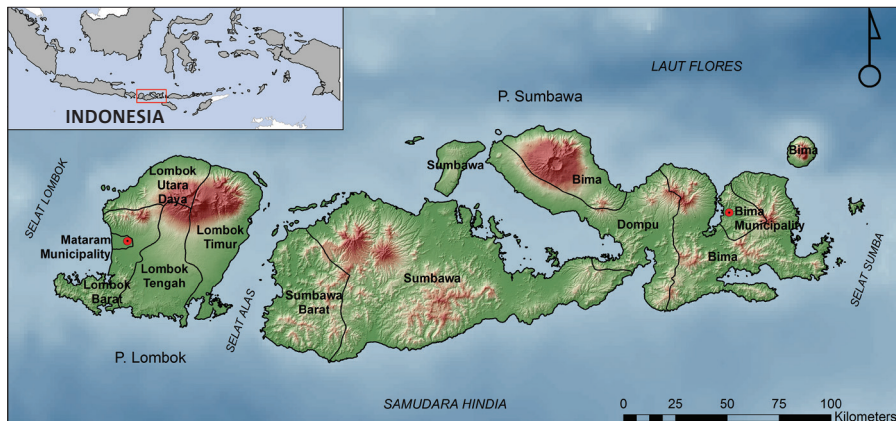
Funded by the AusAID-CSIRO Research for Development Alliance and carried out in partnership with the Government of Indonesia and local stakeholders, the project has downscaled climate projections for the Indonesian province of Nusa Tenggara Barat and identified a number of adaptation strategies to help alleviate poverty in the region.

LEFT Women from a farming community in Lombok, Indonesia, harvest, shave, wash and dry locally grown cassava before bagging and weighing it for sale as an alternative to rice. Photo: Adam Harper/CSIRO



ABOVE Dr James Butler inspects some of the seaweed grown in a floating net known as a 'bunre' to help protect it from damage during wild storms on the east coast of Lombok.

Photo: Adam Harper/CSIRO



Nusa Tenggara Barat (NTB) province in Indonesia.

growers without a market and in debt. Crops also fail when dry seasons bring unexpected rain. In response, farmers travel as migrant labour to Malaysia to earn income to pay back debts, which is often dangerous and less lucrative than hoped and leaves women and children at home in a vulnerable position.

The project has encouraged farmers from the sub-district of Janapria to stop growing tobacco and plant other crops which are more resilient to climate change, provide more direct food security and have less impact on family welfare.

In drier North Lombok, where annual rainfall is projected to decline by 9% by 2030, the project is trialling cassava, which grows very well in dry conditions, as an alternative to rice. Cassava yields about 20-25 tonnes per ha compared to rice which has a yield of about 3.5 tonnes per ha.

Since January 2012, researchers from the University of Mataram have been working with farmers and women in two villages in north Lombok to pilot cassava processing. In the village of Akar-akar, about 500 ha of cassava are grown, with predictions the area could increase to 750 ha in this village alone.

Dr Baiq Rien of the University of Mataram, who has been running the cassava trial believes families will benefit by having an alternative source of income and food. She is working with two women's groups, each with about 15 members.

The groups are producing shredded cassava (sawut) as a rice replacement and cassava flour. Dr Rien says sawut could potentially replace up to 60-70% of rice in the local diet.

"The new skills and knowledge about cassava processing will help farmers and poor villagers survive because each household has a reserve of sawut as a food bank, which can last for more than a year," explains Dr Rien.

As well as identifying alternative livelihood strategies to substitute for tobacco and rice, the project is also working with farmers to improve existing enterprises. In East Lombok, for example, seaweed aquaculture provides an important source of income for coastal villages. Seaweed farming covers a coastal area of about 2500 ha. About 13,850 families are involved in the industry on Lombok and Sumbawa and in 2011, 200,000 tonnes of dry seaweed was produced in Lombok. The seaweed is grown on bamboo rafts moored offshore, which in recent years have been battered by increasingly severe storms, limiting production. With the support of the project, Dr Aluh Nikmatullah of the University of Mataram has developed a simple technology to cultivate seaweed in a way that is more resilient to storms.

Project fosters 'Centre of Excellence' for sustainability science

The project has involved 18 scientists at the University of Mataram, and

helped to build their research skills to become a 'Centre of Excellence' for integrated/sustainability science in eastern Indonesia. These researchers have learned how to integrate downscaled climate projections, population growth estimates, policy evaluation, ecosystem services and livelihoods assessments to analyse communities' future development pathways. With CSIRO, the researchers have developed the participatory scenario planning method which can identify vulnerable livelihoods, and design locally appropriate adaptation strategies which will yield benefits under any future conditions of change.

Project outputs

- ◆ Design of a participatory, multi-stakeholder scenario planning method which identifies livelihood systems most vulnerable to future change, and locally appropriate adaptation strategies
- ◆ A vulnerability atlas for NTB of 106 rural sub-districts which rural development programs are using to prioritise initiatives
- ◆ Recommendations for improving adaptation and food security applied by the Government of Indonesia, UN World Food Programme, NTB Provincial Climate Change Task Force, Central Lombok District and Eco Solutions Lombok
- ◆ A 'Centre of Excellence' for sustainability science and planning established at the University of Mataram

CONTACT US

t 1300 363 400
+61 3 9545 2176
e enquiries@csiro.au
w www.csiro.au

CSIRO AusAid Research for Development Alliance

w www.rfdalliance.com.au
w www.csiro.au/caf

FOR FURTHER INFORMATION Climate Adaptation

Dr James Butler
t +61 7 3833 5734
e james.butler@csiro.au
w www.csiro.au/caf

University of Mataram

Professor Yusuf Sutaryono
t +62 0818 369 007
e ysf_25@yahoo.com