



Sustainable Smallholder Cocoa Farming Through 4R Nutrient Management

INTRODUCTION

Cocoa is a key crop for many Indonesian smallholder farmers, who own over 90% of the country's cocoa production land.

In recent years, however, ageing trees, pests, diseases, poor soil health and nutrient depletion has seen cocoa bean yields fall from around 750kg/ha in the 1980s to below 400 kg/ha over the last two decades.

Despite producing 65% of Indonesia's output, smallholders in Sulawesi lack access to relevant cocoa farming knowledge, farm inputs such as fertilizers and finance.

Many of them are in a downward spiral of poverty, with some ready to give up growing cocoa entirely despite increasing global demand.



DESCRIPTION OF THE INNOVATION

In 2014, the International Plant Nutrition Institute (IPNI) teamed up with local sustainability program Cocoa Care to raise the living standards and productivity of cocoa farmers in Sulawesi.

The aim was to show how best management practices (BMPs) alongside balanced fertilization could improve cocoa bean yields and quality.

Central to the project was 4R Nutrient Stewardship developed by the International Fertilizer Association (IFA): using the right source of fertilizer, at the right rate, time, and in the right place.

Farming families were trained in BMPs and nutrient management for cocoa, such as soil nutrition, pest management and pruning. They also received access to farm tools, fertilizer, compost, high-quality cocoa tree seedlings and business management training.

Highly trained lead local farmers called Cocoa Carers then worked with farmers to conduct trials on their own farms over a two-year period to measure the effects of BMPs and fertilizers.

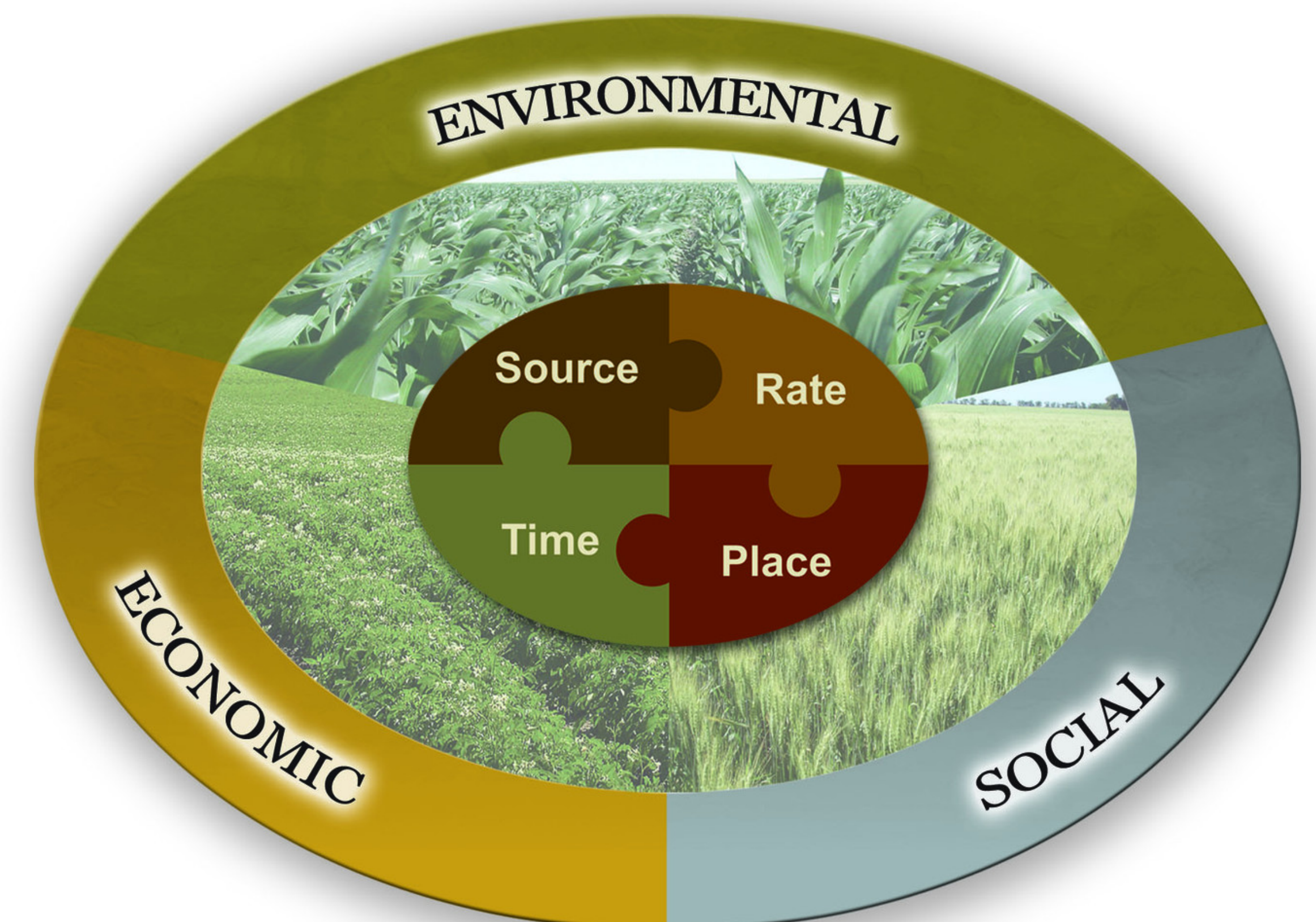


DESIGN AND SHARING OF THE INNOVATION

The project was designed to produce rapid yield improvements that smallholder farmers could see directly and work with the local community to organically spread successful practices.

Farmers from 74 farms took part in trials over a two-year period, with farms split into 100 tree plots to test BMPs, and BMPs plus IPNI fertilizer treatment.

Cocoa Carers monitored and recorded the trials on portable tablets, ensuring information was rapidly available online. Alongside Cocoa Monitors (extension agents with academic backgrounds), they also regularly met with participating and neighboring farmers to discuss progress.



BENEFIT FOR FAMILY FARMERS AND FOOD AND NUTRITION SECURITY

BMPs and balanced fertilization increased both the yield and quality of cocoa, ensuring a sustainable income for smallholder families.

BMPs created improvements within three months. Adding fertilizers produced average yields of over 1,000 kg/ha, over twice the regional average of 500 kg/ha.

With most cocoa traditionally harvested in Sulawesi between June and August, limited income usually restricts farmers' ability to invest in inputs for the rest of the year.

Participating farmers, however, could produce crops regularly throughout the year, ensuring a continuous cash flow to reinvest or spend on food.

IMPACTS ON SOCIAL, ECONOMIC AND ENVIRONMENTAL LEVEL

Producing high yields of quality cocoa beans has benefitted smallholder farmers, their families and the surrounding rural area economically.

There has been a snowball effect on surrounding non-participating farmers in terms of technical knowledge and motivational support as participating farmers share their new-found knowledge.

By teaching farmers 4R Nutrient Stewardship and soil health best practices, the project also helps protect the environment by ensuring minimal nutrient losses and improving soil health, increasing its ability to store water and carbon.

LESSONS LEARNED AND RECOMMENDATIONS

Peer learning between farmers, coupled to strong markets for quality cocoa, is leading to a rapid adoption of improved, intensive management.

The project has identified the most appropriate fertilizer formulations and BMPs to increase cocoa yields in Sulawesi.

To ensure critical nutrient supply, IPNI is currently working to make new formulations commercially available and is developing farmer owned agri-input kiosks, alongside Cocoa Care.