

Palm oil in West and Central Kalimantan, Indonesia

Social and environmental drivers for regulatory action

CONTEXT

Indonesia is the world's largest producer, consumer, and exporter of palm oil. Palm oil exports, at over USD 12 billion per year, represent Indonesia's third largest export earner, after crude oil and natural gas. The Indonesia palm oil sector has experienced continued rapid growth with a 17 percent average annual increase in production between 1985 and 2009. The industry, whose structure combines large plantations and many small-holder producers, provides the main livelihood or source of employment for nearly 5 million people. The West and Central Kalimantan region accounts for some 14 percent of national palm oil production and the island as a whole has the fastest growth rate in palm oil production area in Indonesia with total cultivation area increasing by 1.4 million ha between 2007 and 2011.

ENVIRONMENTAL RISKS AND IMPACTS

Indonesia's expanding palm oil industry has had a very large environmental footprint with adverse impacts felt locally, regionally, and even globally. Rapid expansion has contributed to significant deforestation (from intentional land clearing and unintentional fires), posing threats to many areas of High Conservation Value (HCV), to biodiversity of both local and global importance, and to regional air quality. Some palm oil expansion has occurred, and continues to occur, on carbon-rich drained peat lands. Poor management practices, including over-use of fertilizers and chemical pesticides and degradation of riparian areas, have led to river siltation, soil erosion, water pollution, subsidence (of peat areas) and flooding.

INCENTIVES FOR MITIGATION

These manifold environmental risks and impacts have given rise to domestic and international pressures to change production practices and the patterns of further industry growth. Domestic civil society organizations have sought to protect the land and other resource use rights of communities in areas experiencing palm oil growth. National and international pressure is being applied to reduce greenhouse gas emissions associated with draining and burning of peat swamps and to protect endangered animal species. Agro-industrial companies are facing reputational risks and pressures from



Figure 1. Palm oil worker in Sumatra.

select overseas buyers to adopt more sustainable practices. However, market demand (and the willingness to pay) for sustainably produced palm oil is low given that it is an 'invisible' ingredient found in a large number of consumer products and that global demand is shifting to emerging markets that prioritize price.

POLICY ACTION

In West and Central Kalimantan, forward-thinking policies in commodity production are beginning to emerge from local political empowerment.

Regulator of land, water and natural resource management

Although the national picture is more mixed (if not more commonly problematic), in Central Kalimantan, natural resource management has benefited from decentralization of decision-making power to local regulators. In response to threats posed by oil palm cultivation,



the Governor of Central Kalimantan has implemented regulations to support communities' resource rights, enabled pilot testing by the UN Reducing Emissions from Deforestation and Degradation program, and required companies to monitor and report on social and environmental impacts. Key policy mechanisms included a gubernatorial decree and provincial regulation that provides increased recognition of indigenous land rights and ensures a collaborative mapping process between civil society, local government, and the Ministry of Agriculture. The mapping process and online database are intended to provide greater clarity of land ownership and allocation of production licenses.

In August 2014, the Governor convened a high-level meeting with major oil palm companies, district heads, and national government to set up a dialogue and working group to accelerate progress towards sustainable palm oil production. Although the results are not yet known, open dialogue between key decision makers and land users, especially at the local level, has been cited as critically important for implementation of better practices.

LESSONS LEARNED

International and regional actors see a need for Indonesia to take strong action in promoting sustainable land

management in oil palm landscapes. However, the 'market' solution has thus far not prevented further environmental degradation. Less than 20% of Indonesia's palm oil producing capacity is associated with internationally recognized sustainability standards and the environmental management credentials of some of that production has been questioned. Price premiums for certified palm oil are very small or non-existent. Where the impetus for voluntary action is limited and where producers are not yet bearing the financial costs for poor environmental management practices, government action is needed to address the gaps. In the case of West and Central Kalimantan, local action has been spurred by concerns surrounding land tenure and resource rights, which also provide an opportunity to address larger environmental issues surrounding the sector. Buy-in by multiple stakeholders, including communities and companies active in the landscape, can potentially be increased through open dialogue process such as that pursued by the provincial leadership in Central Kalimantan.



Figure 2. Harvested fresh oil palm fruit bunches.

This note is based upon the case study "Palm Oil in West and Central Kalimantan, Indonesia" prepared by Tanja Havemann and Uray Endang Kusumajaya, which can be found in *Steps Toward Green: Policy responses to the environmental footprint of commodity agriculture in East and Southeast Asia*. This work was done as part of the Greening of Export Agriculture in East and Southeast Asia research program, coordinated by the World Bank. For inquiries, contact Steven Jaffee, sjaffee@worldbank.org. The findings, interpretations and conclusions expressed in this document do not necessarily reflect the views of the Executive Directors of the World Bank Group or the governments they represent. The World Bank Group does not guarantee the accuracy of the data included in this work.

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Coffee in Dak Lak, Vietnam

From growth to sustainability

CONTEXT

In the wake of land and market reforms and a program to spur migration from Vietnam's central coast and northern mountains to its Central Highlands region, the country experienced an unprecedented expansion—by some 400,000 hectares—in coffee plantings during the 1990s. Subsequent additional plantings plus yield improvements have led Vietnam to become the world's largest producer and exporter of Robusta coffee. Vietnam now accounts for 60 percent of global Robusta trade, features the highest yields in the world and the lowest unit costs. The industry provides a livelihood for about half a million smallholder households and a supplemental income for half a million seasonal workers. Production is concentrated in a few provinces with Dak Lak accounting for nearly one-third of the total.

ENVIRONMENTAL RISKS AND IMPACTS

The rapid expansion of the coffee sector in the 1990s and early 2000s was associated with high levels of deforestation, biodiversity loss, and land degradation. More than 20 percent of the coffee planted in Dak Lak has been in areas considered unsuitable for coffee due to soil, topography, water availability or other factors. Production has tended to feature heavy, if not excessive, rates of fertilizer use and heavy water extraction, including from groundwater sources, to ensure high yields. The result has been soil acidification and periodic water shortages in the growing region. A lack of hydrological survey data inhibits a good understanding of the problem. Thus far, regulatory measures, including the licensing of groundwater extraction, and the fining for excessive water use, have been little applied.

INCENTIVES FOR MITIGATION

Coffee accounts for nearly half of the GDP of Dak Lak Province, and the sustainability of livelihoods associated with coffee are critical to the economy of this and several neighboring provinces. Yet, there is emerging competition between coffee, other tree crops, and various non-agricultural sectors (i.e. hydropower; ecotourism, urban residential use) for land and water. Patterns of climatic change have become evident and are likely to pose greater risks in the future. Many farmers are currently



Figure 1. Coffee berries, Vietnam. Photo credit: Tanja Havemann

embarking on a long-term investment via the uprooting and replanting of coffee with the help of government initiatives. Significant investment by the public and private sector is seeking to use a spatially coordinated approach to increase the long-term viability of the sector.

POLICY ACTION

The coffee sector in Dak Lak and the Central Highlands has mostly been exposed to policies aiming to increase production. However, there is a trend toward incremental environmentalism as the consequences of uncontrolled growth become more evident. Recent pilots and applied research have demonstrated the technical feasibility and both the economic and environmental benefits of certain changes in land use, and agronomic and water use practices. The dissemination of this information, and associated farmer training, has contributed to a recent increase in the share of production (to more than 20 percent) taking place under certified or certifiable sustainable practices. Complementary efforts, including effective regulatory measures, are needed, however, as the primary international standard being used does not have stringent requirements for either water resource management or biodiversity protection.

Coordination has been a major barrier to effective mitigation of the environmental impacts of coffee produc-



tion. The 2013 creation of a Coffee Coordination Board offers the potential for improved coordination of sustainability initiatives and improved sector governance overall. The Board is a public-private partnership whose mandate includes advising the Minister of Agriculture and Rural Development on matters of strategy, policy, planning, and programming implementation. The CCB has made environmental sustainability one of the four pillars of its founding strategy, alongside quality, yield, and farmer income. Created by governmental decision, and vested with public and private sector as well as foreign and domestic legitimacy, the CCB faces an unprecedented opportunity to take sustainable practices to scale, drawing on the knowledge and experience acquired to date. Initial efforts have included measures to improve the coordination and quality of extension services, with greater emphasis to be placed on promoting more ecological practices, and to promote farm-level diversification.

The current need by many farmers to access long-term loans in order to finance coffee replanting offers an opportunity to leverage such financing by requiring borrowers to undertake a range of measures (i.e. soil testing; planting of shade trees; applying water saving technologies) to reduce their environmental footprint. More efficient water and fertilizer use will bring considerable cost savings to farmers. Combining concessional financing with intensive farmer training and technology

demonstrations may help turn the tide toward more sustainable practices.

However, the sustainability of coffee production cannot only be pursued farm by farm. In Dak Lak, coffee accounts for 70% of the water used. The relationship between coffee production and other land uses and livelihood strategies in local communities and watersheds needs to be better understood and the available resources better managed by different stakeholders. Efforts to pilot some spatial approaches to natural resources management are just taking shape.

LESSONS LEARNED

One of the key insights from this case has been the difficulty of resolving environmental issues where production is dispersed across a large number of smallholders and a wide geographical area. Where commodity production is consolidated, regulatory measures or promoting voluntary standards may be appropriate. Such approaches have not been successful in Dak Lak. Policy makers have therefore had to apply themselves in a variety of roles, including awareness-raising, training, concessional financing and the coordinating functions described above. These roles can serve to enable, fund and catalyze environmental mitigation in the coffee sector.



Figure 2. Harvested coffee. Photo credit: Tanja Havemann.

This note is based upon the case study “Coffee in Dak Lak, Vietnam” prepared by Tanja Havemann, Samiksha Nair, Emilie Cassou, and Steven Jaffee, which can be found in *Steps Toward Green: Policy responses to the environmental footprint of commodity agriculture in East and Southeast Asia*. This work was done as part of the Greening of Export Agriculture in East and Southeast Asia research program, coordinated by the World Bank. For inquiries, contact Steven Jaffee, sjaffee@worldbank.org. The findings, interpretations and conclusions expressed in this document do not necessarily reflect the views of the Executive Directors of the World Bank Group or the governments they represent. The World Bank Group does not guarantee the accuracy of the data included in this work.

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Shrimp Aquaculture in Ca Mau, Vietnam

Dynamic drivers and public & private sector interventions



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CONTEXT

While shrimp aquaculture has been practiced in Vietnam for decades, commercial production surged during the 2000s, especially in Ca Mau and neighboring provinces in the Mekong Delta. Between 2000 and 2013, production and exports increased five-fold, the latter from \$662 million to more than \$3 billion. Although it was traditionally a very poor and isolated province, the agro-ecological conditions in Ca Mau, together with an engineered network of rivers and canals, have proven to be ideal for extensive shrimp production. A landscape which was once dominated by mangrove forests first saw many years of organized in-migration, land conversion for rice (or rice/shrimp) cultivation and overexploitation of timber for construction and charcoal. A boom in dedicated shrimp aquaculture production followed, with the area covered increasing from 90,000 hectares in 1999 to 240,000 hectares in 2008. Shrimp related activities now account for some 26% of the GDP of the province.

ENVIRONMENTAL RISKS AND IMPACTS

There are two central environmental risks with respect to shrimp aquaculture in Ca Mau. First, the rapid expansion of farming areas, initially for rice fields and later for shrimp ponds, led to massive destruction of the dense mangrove forests that historically characterized the landscape. Between the 1970s and 2010, the estimated area under mangroves fell from 200,000 hectares to 64,500 hectares. Second, the rapid area expansion of shrimp production has contributed to water pollution. Silt deposits together with shrimp waste are often released into the rivers and canal systems without proper treatment, contaminating soil, water, and coastal habitats.

INCENTIVES FOR MITIGATION

Vietnam's shrimp aquaculture has faced challenges in controlling diseases affecting productivity and morbidity. Chemicals and antibiotics have been widely applied. Although water pollution from chemical contamination is currently less problematic in Ca Mau due to its extensive production systems, poor management of human and agricultural waste and water from ponds where there have been disease outbreaks, continue to pose risks to



Figure 1. Shrimp ponds in Ca Mau. Photo credit: Samiksha Nair

the environment and to human health. Additionally, as it has become increasingly difficult to expand production areas, farmers and the government have needed to consider alternative means of maintaining Ca Mau's comparative advantage in shrimp production. Local policy is required to effectively create the enabling environment for voluntary action in Ca Mau. International and civil society pressure, specifically around health and food safety and reforestation has helped in pushing mitigation measures further. A mix of incentives and a range of policy interventions in this landscape from actors across the value chain are critical.

POLICY ACTION

National and local governments, after largely promoting expansion of shrimp aquaculture have recently begun to recognize the environmental impacts and challenges of quality demands from the global market. Ca Mau, due to its unique ecological position, has continued to try and exploit the niche of extensive shrimp/



mangrove aquaculture. One approach taken has been the application of zoning regulations, dividing areas among those where mangroves need to be fully protected, areas featuring mixed mangroves/farming and those where shrimp aquaculture and other agricultural activities can predominate. However, regulatory solutions have been challenging where production involves hundreds of thousands of producers. Ca Mau, therefore, has also leaned on technical assistance and collaboration with NGOs and the private sector.

The Ca Mau Department of Agriculture and Rural Development has focused on promoting the adoption of a set of Good Aquaculture Practices through pilot projects, such as the adoption of Natureland standards as part of the Mangroves and Markets project with SNV, IUCN and the private sector. This public private partnership has allowed the government to support the development of systems to manage traceability, ensure product quality and protect the environment through collaboration between farmers, collectors, processors and forestry companies. The Coastal Resources for Sustainable Development

project with the World Bank also includes measures to promote sustainable practices, yet also includes components on integrated spatial planning within and between shrimp growing provinces. The local government has outlined plans to promote an ‘organic coast’ for Ca Mau, applying an integrated landscape management approach.

LESSONS LEARNED

Spatially dispersed small-scale production is a difficult terrain in which to apply agro-environmental regulations. In such circumstances a mix of incentives and various collaborations with the private sector and civil society are often needed to ensure farmer compliance with environmental safeguards. Where environmental concerns are paired with concerns about productivity (i.e. the incidence of disease) and product quality, there are better prospects for inducing changes in farmer practices.



Figure 2. Shrimp farm, Vietnam. Photo credit: Samiksha Nair

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Tea in Yunnan, China

A blend of environmental and economic goals

CONTEXT

China is the world's largest producer of tea, in particular of non-black tea varieties, and most of this tea is consumed domestically. Tea is recognized by Chinese authorities as an important product and is specifically referred to in the government's Five Year Plans. Chinese tea production continues to grow, along with demand, averaging 8 percent per year between 2001 and 2010. Within China, Yunnan Province is one of China's leading tea-growing areas and is among the most progressive in terms of quality management, environmental management, and the application of geographical product identification.

ENVIRONMENTAL RISKS AND IMPACTS

The expansion of monoculture tea, rubber, and sugarcane plantations in Yunnan province has, over the years, contributed to significant environmental problems. Forest clearing on sloped lands during the 1980s and 1990s was seen as a contributor to the devastating Yangtze River floods in 1998, prompting the government to initiate forest conservation and reforestation programs. The main environmental risks associated with tea production are the overuse of agro-chemicals (degrading local biodiversity and downstream water quality) and erosion from land clearing (contributing to local soil degradation and the flooding of downstream communities). Heavy agro-chemical use has also adversely affected the health of tea producers and consumers. Concerns about high levels of pesticide use have deterred some consumers, both abroad and at home, from purchasing tea from many Chinese sources.

INCENTIVES FOR MITIGATION

While downstream flooding catalyzed an array of forestry programs in higher altitude areas where Yunnan tea thrives, several recent interventions have been spurred by perceived threats to the reputation – and cultural heritage – of tea from Yunnan province in general as well as from specific local areas. Maintaining the region's traditional tea agro-forests and continuing to realize significant price premiums for 'ecologically produced' tea have been major objectives of tea growers, the industry, and local government entities. This has represented a convergence of economic and environmental interests.



Figure 1. Tea agro-forests in China. Photo by Angela Hu.

POLICY ACTION

In response to threats posed by large-scale production of tea and other estate crops, the Chinese government has developed a sophisticated 'eco-compensation' strategy comprised of many policies designed to incentivize better management practices and reduce expansion onto unsuitable lands. Two major programs – the 'National Forest Protection Program' and the 'Sloping Land Farmland Conversion Program' – have set limits on the land available for agriculture, and are among the largest of their kind in the world.

The national and local policy framework for tea production in China has evolved from recognition of the need to simply maintain forest cover (i.e. 'green growth') to a more nuanced understanding of environmental management demonstrated by the recent emphasis on 'higher quality growth.' Also, there are now dozens of certifications and labels for Chinese tea internationally (Global GAP, Rainforest Alliance, nationally (hazard-free,

green, Chinese GAP), and regionally (geographic indication). This proliferation of labels, together with traceability challenges and periodic health scares related to tea and pesticides, has weakened consumer confidence and led some buyers and consumers to restrict purchasing to particular brands or origins of tea that they trust.

Perhaps the most advanced efforts to build consumer confidence and blend environmental and economic goals have occurred in the vicinity of Yunnan's Pu'er City, a locality known for its rich environmental and cultural history. Some 35% of local income derives from tea and Pu'er is widely promoting the science and application of 'ecological' tea production in the local agro-ecosystem. A successful combination of training and subsidies has decreased the density of tea trees on farms, reduced agro-chemical use, better integrated tea with mixed agro-forestry, and improved biodiversity on managed areas. Comprehensive quality standards determine which tea is allowed to carry the Pu'er name. A well-equipped local tea testing laboratory helps to ensure a quality and safe product from Pu'er City farms and plan-



tations. Pu'er City has applied for its 187,000 hectare Tea Garden and Tea Culture area to be recognized as a "Globally Important Agricultural Heritage Site."

LESSONS LEARNED

The experience of Pu'er illustrates the potential for integrating environmental, economic, and social objectives in the context of an agricultural commodity landscape. The credibility of the Pu'er initiative has required the collaboration of farmers, industry, scientists, and local government, plus an ability to draw upon resources made available from national level programs. While Pu'er tea has long had a reputation for providing specific health benefits, its differentiation on ecological grounds has struck a chord among buyers and consumers who have been concerned about pesticide residues in Chinese tea and confused by a proliferation of labels and (real or alleged) certifications.



Figure 2. Tea processing plant. Photo credit: Angela Hu

This note is based upon the case study "Tea Landscapes in Yunnan, China" prepared by Tanja Havemann, which can be found in *Steps Toward Green: Policy responses to the environmental footprint of commodity agriculture in East and Southeast Asia*. This work was done as part of the Greening of Export Agriculture in East and Southeast Asia research program, coordinated by the World Bank. For inquiries, contact Steven Jaffee, sjaffee@worldbank.org. The findings, interpretations and conclusions expressed in this document do not necessarily reflect the views of the Executive Directors of the World Bank Group or the governments they represent. The World Bank Group does not guarantee the accuracy of the data included in this work.

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Maize in the Mae Chaem Watershed, Thailand

Upstream action to protect downstream farm systems



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CONTEXT

Thailand is Southeast Asia's leading producer of maize, which is heavily oriented toward providing feed for the poultry industry. Prior to the avian influenza outbreak of 2004, Thailand was the fourth largest exporter of poultry worldwide, generating over USD 2 billion in export receipts. Thailand's maize production accelerated in the 1990s, primarily through contract farming arrangements, as it was introduced to Northwestern Thailand as an alternative cash crop to opium.

ENVIRONMENTAL RISKS AND IMPACTS

To enable communities in Mae Chaem to shift to alternative cash crops, the Thai government, with its development partners, facilitated improved production of maize and a variety of vegetables as well as better linkages between area farmers and traders who, in turn, deal with larger agro-processors. With increasing demographic pressures, farmers began making use of environmentally fragile areas deemed to be 'underutilized' and encroaching on forests. This land 'extensification' has contributed to deforestation, soil erosion and degradation, and overuse of agrochemicals and water pollution. Lack of coordination in water use has led to changes in local hydrology, affecting water flows for hydropower and contributing to downstream flooding.



Figure 2. Community meeting in Mae Chaem. Photo credit: Raks Thai



Figure 1. Upland rice fields, Thailand. Photo credit: Raks Thai

INCENTIVES FOR MITIGATION

Northwestern Thailand serves as the catchment area for a number of the nation's most important rivers including the Chao Phraya which supports the country's most productive agricultural land, its supply of electricity, and economic and residential life in Bangkok. Changes in upstream hydrology, siltation from soil erosion, and pollution from heavy agro-chemical use in uplands areas thus impose high costs on the country. However, if environmental protection policies were to disrupt the livelihoods of upstream maize farmers, renewed opium production, reduced maize supply to poultry producers, and major social problems could result.

POLICY ACTION

Promoter of voluntary action

Civil society engagement with national and local government has led to promotion of better land management by generating innovative watershed planning and management organizations. The Tambon Administrative Organizations (TAOs), over 8,000 in total, have been given freedom to raise local revenues, issue local regulations, and formulate and implement development plans. Two NGOs, Raks Thai and the Royal Project Foundation, have played key roles in building the capacity of TAOs and oth-

er groups. Raks Thai helped to develop and implement strategies for reducing deforestation by raising awareness of land rights and localizing some national regulations linked to watershed management. Data gathering, modeling, and open discussion at the local level, combined with decentralized control of defined micro-watersheds, has helped to improve the region's environment. Raks Thai and CARE contributed to development of three-dimensional watershed maps, which have been used to facilitate agreement on land boundaries and to assign areas of responsibility to community groups and members in different parts of the watershed.

While the Royal Projects Foundation has developed and sought to promote a comprehensive organic system for horticultural production, the commercial success of this has been uneven over time. In relation to maize, there has been no comprehensive program introduced to promote more sustainable land use and production practices. The fragmented maize value chain and the very limited direct interaction between Mae Chaem farmers

and the larger downstream animal feed and food processing companies has inhibited market-driven catalysts for more environmentally sustainable practices.

LESSONS LEARNED

Where supply chains are complex, commodities have low value, or market-based leverage for more sustainable practices is difficult to apply, opportunities for change may be found through decentralized multi-stakeholder platforms that address a variety of socio-economic and environmental challenges. In Northwestern Thailand, some progress has been achieved in land and water resources management through participatory processes emerging from empowerment of TAOs and the subsequent emergence of various civil society organizations. The success of these efforts required long-term support from government, NGOs, and development partners.



Figure 3. A monoculture of corn grown on inappropriate land, during harvest. Photo by Raks Thai.

This note is based upon the case study “Multiple Commodities in the Mae Chaem Watershed, Thailand” prepared by Tanja Havemann, which can be found in *Steps Toward Green: Policy responses to the environmental footprint of commodity agriculture in East and Southeast Asia*. This work was done as part of the Greening of Export Agriculture in East and Southeast Asia research program, coordinated by the World Bank. For inquiries, contact Steven Jaffee, sjaffee@worldbank.org. The findings, interpretations and conclusions expressed in this document do not necessarily reflect the views of the Executive Directors of the World Bank Group or the governments they represent. The World Bank Group does not guarantee the accuracy of the data included in this work.

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Bananas in Mindanao, Philippines

Potential for environmental mitigation using a landscape approach



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CONTEXT

Banana production is extremely important to Mindanao and the Philippines as a whole, bringing in over \$646 million in 2012 (second only to coconut oil in terms of export receipts from agriculture). With 75 percent of total production located on Mindanao, negative environmental effects of banana production are particularly important to the long-term sustainability of commodity agriculture in this region.

ENVIRONMENTAL RISKS AND IMPACTS

Risks from banana production are manifold, and are beginning to be noticed by national policymakers. Reduced water quantity due to abstraction by plantations has led to conflicts with downstream users. Water and air pollution from improper use of fertilizers and aerial spraying of pesticides pose a significant public health risk, and also lead to loss of terrestrial and aquatic biodiversity. Soil erosion and degradation from land clearing and poor management practices are a further issue in production.

INCENTIVES FOR MITIGATION

Public health has been a rallying cry for changes in production practices in the Philippines. Natural Capital Accounting was introduced in the 1990s to facilitate environmental risk identification and mitigation, and has gained some traction; however more collaboration between policymakers across regions and levels of government is needed for it to really take root. The WAVES partnership is working to lay the foundation for taking this accounting into policy planning. Payments for ecosystem services (PES) have been used by the World Agroforestry Centre for many years, along with Philippines sub-national programs. The government has also tested using water permits to promote better practices, and enforcing penalties for “environmental endangerment,” listed in the local Government Code of 1991.

POLICY ACTION

Only 2.1 percent of the Philippine banana market is currently organic or Rainforest Alliance certified. There have been calls from civil society and local government, and support to develop projects that seek to account for



Figure 1. Bunches of bananas, Philippines. Photo credit: Luis Mazier on [Flickr](#).

natural capital and smallholders’ access to land and marketing capacity. National and sub-national PES programs are also in place and policy in general is working towards improving practices in the industry, and there are some regulations in place that enable these interventions.

Funder of environmental practices and investments

In response to the threats posed by banana production, the Philippines governments, along with NGOs such as ICRAF and WWF and the WAVES partnership have piloted many different initiatives exploring landscape level natural resource management. Natural capital accounting and payments for ecosystem services (PES) have been a particular point of emphasis in the watersheds where banana is produced.

In the Manupali watershed the local environment and natural resource office, in response to the negative impacts of intensive banana production on water availability and quality, developed a reward system for farmers

who adopted better management practices, and tried to engage the banana industry in the region.

LESSONS LEARNED

The challenges associated with increasing the sustainability of banana production through landscape approaches in the Philippines include a lack of clear metrics and technical information, a lack of strong commitment by local government, and low capacity, both financially and in knowledge and skills, with small scale farmers.

Nonetheless, stakeholders can build on existing efforts and open new opportunities, through several approaches:

- Promote improved environmental management through practice codes and farmer associations, including farmer contract programs.
- Work within the emerging NCA and WAVES frameworks and major banana multinationals to incentivize improved practices throughout the value chain.
- Adapt Landcare models for farmer-led improvements in environmental management linked to improved



local government action.

- Tie good environmental practices to access to government incentives for plantation licenses and access to credits and other farmer incentives.
- Support farmers to diversify incomes.
- Develop more opportunities for selling certified produce.
- Work with brand name companies and companies with a supportive investor base to implement more sustainable practices within the local banana industry.
- Better integrate landscape indicators into Philippine Good Agricultural Practices (GAP) certification.
- Develop sustainable “agri-food clusters,” linked to infrastructure access such as ripening rooms, cold storage, and ports.
- Facilitate multi-stakeholder partnerships to support small-scale farmers in a way that can also promote improved local environmental outcomes.



Figure 2. Banana storage. Photo credit: David Llorito/World Bank

This note is based upon the case study “Banana Production in Mindanao, Philippines” prepared by Tanja Havemann and Naomi Rosenthal, which can be found in *Steps Toward Green: Policy responses to the environmental footprint of commodity agriculture in East and Southeast Asia*. This work was done as part of the Greening of Export Agriculture in East and Southeast Asia research program, coordinated by the World Bank. For inquiries, contact Steven Jaffee, sjaffee@worldbank.org. The findings, interpretations and conclusions expressed in this document do not necessarily reflect the views of the Executive Directors of the World Bank Group or the governments they represent. The World Bank Group does not guarantee the accuracy of the data included in this work.

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