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Competing Water Claims in Biofuel Feedstock Operations in Central Kalimantan

Community Grievances and Pathways to Improved Governance of Oil Palm Concessions

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Competing Water Claims in Biofuel Feedstock Operations in Central Kalimantan

Community Grievances and Pathways to Improved Governance of Oil Palm Concessions

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EXECUTIVE SUMMARY

The Renewable Energy Directive (2009/28/EC) (EU-RED) sets the European Union (EU) a target that 10 % of the energy used in the transport sector across the EU should be generated from renewable sources. To be eligible for government support or to count towards mandatory national renewable energy targets, biofuels used in the EU – whether produced locally or imported – have to comply with the so-called Sustainability Criteria, which are set out in articles 17, 18 and 19 of the EU-RED. So far, the main policy debate on the Sustainability Criteria has concerned greenhouse gas (GHG) emissions and indirect land use change. In the midst of these debates, the architecture of EU policy and its implementation by member states have led to a de-facto delegation of responsibility for impacts on local livelihoods and on natural resources, such as water, to voluntary stakeholder-negotiated sustainability standards.

While investors may be keen to demonstrate their commitment to sustainable water management in their chains of custody, at present, many retailers that import palm oil products into Europe have postponed the adoption of specific standards. Contributors to the present study indicate that such retailers do not see these standards as sufficiently robust from a scientific perspective, or adequately supported by the relevant governing bodies and stakeholder forums, leaving their companies potentially vulnerable to criticism. With regard to public regulation, many producer countries in the South are well known to be struggling with inadequately resourced, decentralized governmental agencies.

Objective and methodology

Recognising the limited understanding of how EU imports of biofuel products affect water resources and their management in producer countries, SEI and its partners decided to undertake a pilot study to: explore the impacts on water resources arising from biofuel feedstock production; map any ambiguities in how diverging claims are reconciled; and examine how the governance system can be improved. The study focused on two key research questions:

1. What water-related impacts and risks arise from biofuel feedstock operations?
2. How does the current governance system manage these impacts and risks?

These questions were explored using a qualitative case study methodology based on the principles of participatory action research. This aimed to provide a range of stakeholders, with equally legitimate perspectives on water resource management in biofuel feedstock operations, with an opportunity to comment on what they believe to be the most pertinent risks and impacts, and to critique the performance of current governance mechanisms.

The selected case study is the production of palm oil in Central Kalimantan Province and the Mentaya and Seruyan River Basins of Indonesian Borneo. Palm oil, generally traded as Crude Palm Oil (CPO), is one of the main substrates for biodiesel. Biodiesel accounts for over three-quarters (77.3 %) of total EU biofuel consumption, and imports into the EU increased by around 23 % between 2009 and 2010. Indonesia and Malaysia are the largest exporters to the EU after Argentina and the United States. The Indonesian palm oil sector is one of the longest established agro-industries for vegetable oil. This provides an opportunity for new and emerging producer countries to learn from its accumulated experience, which has been shaped by the historical and political legacy of Dutch colonialism, and post-colonial nation building and decentralization policies.

The primary data for this study are derived from two weeks of fieldwork in October 2011, focused on study sites in the Seruyan and Kotawaringin Timur Districts. Consultations followed a semi-structured open-ended interview format, and relevant secondary information was retrieved from legal documents, policies and strategies, reports and research articles. In total, the study received contributions from 17 people from three villages; 17 government officials from nine agencies at the district, province and central government levels; seven Chief Executive Officers and managers from four private sector organizations; 11 staff members

from five civil society organizations at the district, province and national levels; and three staff from two research institutions.

Key lessons from the assessment

Community grievances that require immediate attention (section 5.1)

The synthesis of stakeholder views highlights a range of relevant complaints and grievances shared by villagers and those who directly experience water resource-related impacts on their lives in or close to the plantations:

1) Land clearing, erosion and run-off from plantations leading to turbid and murky water;
2) Release of toxins into the water bodies through the spraying of pesticides on plantations;
3) A decline in fish stocks and aquatic wild plants;
4) Palm Oil Mill Effluent (POME) and other palm oil waste either dumped or otherwise released into rivers and streams, including overflowing waste dams in the rainy season;
5) A reduction in or redirection of water flows linked to the construction of channels and dams for plantations;
6) Floods linked to deforestation, which increases flows and the risk of flash floods in the rainy season;
7) Drying of community land adjacent to plantations and a lowering of the water table (incl. wells), forcing villagers to give up traditional rice farming and work in oil palm production.

Beyond the immediate concerns related to water resource degradation, there are reports of a downward spiral of increased dependency on the plantations and their companies as water-dependent livelihoods such as rice and other crop cultivation, and fisheries are undermined due to water scarcity and pollution, and when households depend on the plantations for their drinking water supply. Current governance mechanisms are apparently unable to investigate and respond to the impacts on water resources in Central Kalimantan Province. Nor do they seem capable of providing affected communities with fair opportunities to shape water resource management. Systemic weaknesses and outstanding complaints undermine the credibility of the claims of responsible production made by growers, even those which may in fact be investing heavily in the production of sustainable palm oil with good water management practices.

The need for consolidated and trusted water-resource data (section 5.2)

There is only a limited, and often divergent, understanding of the water requirements for palm oil plantations, and the impacts of these requirements on rivers, lakes and groundwater aquifers. In particular, there is uncertainty over the relative role of different sources of pollution, and stakeholders disagree over the exact causes of the pollution experienced by villagers at the field sites. The assessment reveals a contradiction between the dependence of formal governance structures in the public sector on comprehensive and quantitative monitoring data and the inability of existing institutions to deliver such extensive and trusted information. This gap between expectations and reality undermines the ability of governance structures to attribute responsibility or specific liabilities for impacts on specific local water resources. In particular, it makes it difficult to identify the relative burden to be placed on the palm oil industry compared to other upstream users of water.

Proposals for regulatory improvements (section 5.3)

Contributors highlighted a number of gaps in current regulations that require attention. These include the limited legal guidance on the use of drainage channels or the regulation of water flows to maintain desirable water table levels at the catchment level in and around plantations. Similarly, some contributors raised the need for official guidelines or procedures on water

management and plantation planning at the level of catchments and/or peat land units, which are particularly important where much-needed public sector river basin management has not yet been implemented. Furthermore, although important legal provisions have been put in place by the Provincial Governor to address the uncertainty over land rights (such as recent provincial laws that recognize customary rights to land), few if any targeted actions have been taken with regard to water rights.

Recognizing the hydrological function of peatlands (section 5.4)

One particular hydrological issue to emerge was the risks arising from the release of toxic ferrous oxide from degraded peatlands exploited by oil palm concessions. The intrinsic hydrological dynamics of peatlands and their roles in carbon sequestration and promoting biodiversity are well known, but the ecological damage arising from the oxidation (aerobic decomposition) of peat and the related release of peat toxins have not been acknowledged in current debates or projects.

Perverse consequences of EU greenhouse gas emission politics (section 5.5)

The limited appreciation of the direct water-related ecosystem services provided by peatland forests serves as a concrete reflection of the "water blindness" that characterizes the current international debate on the production of biofuel feedstocks. Extensive conversion of peatlands had taken place prior to the 2008 baseline set in the EU-RED (and this is still taking place), and the Sustainability Criteria encompass only land use change while disregarding water resource exploitation in the actual processes of cultivation and production. This demonstrates how the Sustainability Criteria are maladapted to matching the socio-ecological reality and production history in a context such as Central Kalimantan. Tracing the narratives of water-related observations from the village level to Jakarta, it became apparent how local complaints about impacts on water resource are "diluted" through the network of actors up to the national level. Concerns over the negative impacts on water resources lose their significance at higher government levels vis-à-vis issues related to the GHG emissions of the oil palm industry. This biased emphasis is understandable given the architecture of the EU-RED and its Sustainability Criteria, which have an almost exclusively one-eyed emphasis on GHG emissions at the expense of other environmental and livelihoods-related concerns.

Failures of the regulatory regime (section 5.6.)

There is a general failure by existing public sector mechanisms to adequately respond to community grievances related to water resources. This includes weak implementation of integrated basin and catchment management, general environmental provisions, land permits, spatial planning and the procedures pertaining to environmental impact assessment (Amdal). One reason for the cost-competitiveness of the production of palm oil in the global market, and in turn its rapid expansion, is the low "costs of compliance" with environmental and social regulations and requirements. Observations of a lack of acceptable spatial planning, conflicting maps at different levels of government, and trading in land permits by the political executives substantiate the existence of a political struggle between central and sub-national government to secure benefits from forest and land resources at the expense of water resources and local livelihoods.

Strengthening stakeholder-negotiated sustainability standards (section 5.7)

Multi-stakeholder negotiated, voluntary and market-based trade standards, such as those offered by the Roundtable for Sustainable Palm Oil (RSPO), are a vital complement to public sector regulation. However, implementation of the RSPO principles and criteria (P&Cs) on the plantations appears to be relatively weak. At the sites visited, several of the companies or parts of their operations, such as mills or suppliers, were RSPO certified, but these operations were criticized for their non-compliance with both the RSPO P&Cs and public sector regulations. It is argued that the RSPO has difficulties enforcing its code of conduct and grievance procedure, and it has not yet excluded any grower from its membership. A lack of commitment from buyers makes it difficult for the RSPO to provide economic incentives to counter the costs of

compliance with certification and auditing. There is a need to both foster an improved demand side response and link multi-stakeholder, negotiated sustainability schemes such as the RSPO's to bilateral or multilateral trade agreements in order to obtain further leverage.

Recommendations (section 6)

To actors in Central Kalimantan Province

- Urgently address the grievances of local communities
- Strengthen the capacity to enforce public legislation in the oil palm sector
- Address the gaps in public regulation to improve integrated catchment and river basin management
- Clarify constitutional "water rights"
- Establish and fund complementary conflict resolution mechanisms
- Incorporate water-related ecosystem services into the implementation of Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD) in Central Kalimantan Province
- Provide direct strategic financing for water monitoring and build institutional capacity
- Apply participatory water assessment methodologies
- Undertake independent studies of water management practices on the plantations

To the EU and its member states

- Address the apparent conflict with the Policy Coherence for Development agenda in the EU-RED
- Include mandatory criteria for integrated river basin water resource management in renewable energy policies, including the EU-RED
- Strengthen traceability and transparency in the chain of custody
- Consider alternative fiscal regulations beyond the EU-RED

To European market actors

- Embed sustainability standards, such as those of the RSPO, in the corporate social responsibility policies and practices of European buyers
- Prioritize sustainability standards with a strong emphasis on water resources
- Ensure that equal attention is paid to the chain of custody for palm oil used for non-energy purposes

To the coordinators of voluntary market standards, such as the RSPO

- Consider developing more robust indicators for auditing
- Assess the need to develop targeted criteria for water resource management in the RSPO P&Cs
- Work to align the forthcoming Indonesian Sustainable Palm Oil (ISPO) criteria and the established RSPO P&Cs
- Strive to embed the RSPO's requirements in bilateral and multilateral trade agreements

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ABOUT THE COLLABORATING ORGANIZATIONS

Wahana Lingkungan Hidup Indonesia (WALHI) is the largest non-profit and non-governmental environmental organization in Indonesia. WALHI is present in 27 provinces. It has 479 member organizations and 156 individual members engaged at the local and national levels. Internationally, WALHI campaigns through the network Friends of the Earth International, which consists of grassroots organizations in 70 countries, 15 affiliated organizations and more than 2 million individual members and supporters around the world. *WALHI Central Kalimantan* is the provincial organization, working to achieve the people's sovereignty in the management of natural resources in a fair and sustainable manner based on the principles of the people's well-being and human rights. Website: www.walhikalteng.org. Contact: Arie Rompas (arie.rompas@gmail.com).

Sawit Watch is an Indonesian non-governmental organization concerned with the adverse social and environmental impacts of large-scale oil palm plantation development in Indonesia. Sawit Watch promotes sustainable social and ecological justice mandates by combining human rights and needs-based approaches in its activities and interventions for and with indigenous peoples, local communities, smallholder palm oil farmers and plantation workers engaged in the palm oil industry. Since 1998, it has built a network of more than 75 local partners who work with around 660 conflict-stricken communities in 17 provinces. Website: www.sawitwatch.or.id. Contact: Norman Jiwan (norman@sawitwatch.or.id).

Stockholm Environment Institute (SEI) is an independent, international research institute, headquartered in Sweden and with over 250 staff and six offices and centres around the world. It has been engaged in environmental and development issues on a local, national, regional and global scale for more than a quarter of a century. SEI supports decision-making for sustainable development by bridging science, policy and practice as a non-partisan research institute committed to rigorous and integrated decision-making. The work presented in this report was undertaken through SEI's international research theme Transforming Governance, which aims to support the improvement of governance for sustainable development through the facilitation of learning and collective action within civil society, markets and the public sphere. Website: http://www.sei-international.org. Contact: Rasmus K. Larsen (rasmus.klocker.larsen@sei-international.org).

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LIST OF ACRONYMS

BOD	Biological Oxygen Demand
BP DAS	River Basin Authority (for the Kahayan River Basin)
CSR	Corporate social responsibility
HGU	*Hak Guna Usaha* (concession permit)
GHG	Greenhouse gas
EIA	Environmental Impact Assessment
EU	European Union
EU-FQD	EU Fuel Quality Directive
EU-RED	EU Renewable Energy Directive
FAO	Food and Agriculture Organization of the United Nations
HCVA	High Conservation Value Areas
ILUC	Indirect land use change
IMF	International Monetary Fund
NGO	Non-governmental Organization
PDAM	Local state-owned drinking water utility company
POME	Palm oil mill effluent
P&Cs	Principles and criteria (of the RSPO)
RSPO	Roundtable for Sustainable Palm Oil
SPO	Sustainable palm oil (certified by the RSPO)
REDD	Reducing Emissions from Deforestation and Forest Degradation in Developing Countries
WTO	World Trade Organization

1. INTRODUCTION

The European Union (EU), motivated by both climate change mitigation and energy security objectives, has introduced renewable energy strategies that establish it as one of the major importers and consumers of biofuels. This is part of an international trend to promote bioenergy, which stimulates the global market and expands the number of multinational companies engaged in biofuel feedstock production in low-income countries in the South. There is widespread disagreement, however, about whether it is possible to ensure robust monitoring of how biofuel feedstock cultivation affects local livelihoods, and to prevent European political priorities undermining natural resource use by people living near or engaged in production. The lack of consolidated knowledge means that consumers, social movements, national governments and corporate leaders face significant uncertainty over how to shoulder their respective responsibilities, while political decisions may be uninformed and opportunities for collective action undermined.

This report has grown out of a recognition of the limited understanding of how importing biofuel feedstock into the EU affects water resources and water management in producer countries. As is outlined below, there is currently no EU regulation of water resource management associated with the production of imported biofuel feedstocks, and responsibility for the adoption and implementation of voluntary sustainability standards is delegated to market actors. Although market-based incentives may in many cases be more effective than public regulation in fostering progress towards sustainable development, the lack of coordinated governance raises serious concerns about the extent to which EU demand is causing perverse policy impacts that conflict with the ambitions of Policy Coherence for Development (European Commission 2007). Furthermore, past research on the consequences of biofuel feedstock production has paid limited attention to the risks to and impacts on water resources, and even less to how the use of such water resources is governed in practice.

This report is one in a set of pilot studies by the Stockholm Environment Institute (SEI) and its partners that examines the impacts of and risks for water resource management as well as the wider land use changes associated with biofuel feedstock production. The report focuses on selected locations in Central Kalimantan Province, Indonesian Borneo, as a "case study" of palm oil production, part of which is exported for biodiesel. The work is a qualitative analysis of how the governance of oil palm plantations in the province promotes the management of water resources. We also communicate the voices of a range of stakeholders with the aim of contributing to a constructive but critical dialogue on how current governance systems can be improved.

2. BACKGROUND

2.1 Questioning the rigour of the EU sustainability framework

The Renewable Energy Directive (2009/28/EC) (EU-RED) sets the European Union (EU) a target that 10% of the energy used in the transport sector across the EU should be generated from renewable sources. There are many potential options for renewable fuel in the transport sector, and there are many opportunities for member states to develop targeted programmes to promote particular renewables (e.g. electric vehicles, biogas, etc.). However, member states have generally chosen to prioritize liquid biofuels, which are thought to represent the most cost-competitive option in the short term.

To be eligible for government support or to count towards mandatory national renewable energy targets, biofuels used in the EU – whether produced locally or imported – have to

comply with the so-called Sustainability Criteria set out in articles 17, 18 and 19 of the EU-RED. The same criteria are applied in the Fuel Quality Directive (2009/30/EC) (EU-FQD), as amended in 2009, which establishes environmental criteria for the fossil fuel components of petrol and diesel. The Sustainability Criteria, in effect since December 2010, stipulate a minimum level of direct greenhouse gas (GHG) emission savings (35 % in 2009, rising to 50 % in 2017), and impose restrictions on the cultivation of land with a high level of biodiversity or land with high carbon stocks (such as peatland and wetlands), as well as agro-environmental practices. They also prohibit the conversion of such areas to production after the baseline date of January 2008 (art. 17).

In June 2010, the European Commission announced its scheme for certifying sustainable biofuels. Member states were obliged to transpose the EU-RED into national legislation by December 2010, although many delayed. National authorities, companies and NGOs are encouraged to implement voluntary biofuel sustainability certification schemes, and the Commission indicates which criteria these schemes must meet in order to achieve EU-wide recognition. In a Commission Implementing Decision of July 2011, seven certification schemes were approved as demonstrating compliance with the Sustainability Criteria (European Commission 2011a; European Commission 2012). More certification schemes have since then been added.

Member states have implemented the directive in varying ways. Some rely solely on tax exemptions on biofuels, while others combine these with regulations that require companies to contribute a specific minimum amount to the national renewable energy target. To monitor compliance with certification scheme standards, auditing uses the mass balance model, in which economic providers in the chain of custody must show that the share of the product certified reflects the share of the final product. This method is less strict than so-called identity preservation, which is obtained through physical isolation of the product, but stricter than the "book and claim" system, which does not trace the origin of the products (Johnson 2011). The mass balance system is considered extremely stringent but also resource intensive, and the European Commission is re-evaluating its future use of the system (European Commission 2011b).

The main policy debate so far over the Sustainability Criteria concerns indirect land use change (ILUC). Since the drafting of the EU-RED and the EU-FQD, the European Parliament and the Commission have faced uncertainties associated with accounting for ILUC. The Commission is currently reviewing the results of four studies on the consequences of ILUC with a view to producing final proposals for action. Statistical analyses have demonstrated that emissions from land use change linked to biofuel feedstock production significantly reduce the environmental benefits of the policy framework (e.g. Laborde 2011). In 2011, the Directorates General of Energy and Climate Action agreed a seven-year delay in setting out concrete actions on ILUC (Dunmore 2011), thus choosing not to apply the precautionary principle.

In the light of these debates, the architecture of EU policies and their implementation by member states have led to a de facto delegation of responsibilities for monitoring and reducing negative impacts on local livelihoods and natural resources to voluntary, stakeholder-negotiated sustainability standards. The directive encourages bilateral and multilateral agreements on biofuels, but neither the European Commission nor the exporting countries have explored this option (Johnson et al. 2012). Although the EU's Sustainability Criteria stipulate restrictions on direct GHG emissions and the use of certain land types, they do not include socio-economic criteria on the impact on local livelihoods (van Dam et al.

2010). There is thus no attempt by the EU to regulate for promotion of sustainable water resource management in production outside its borders, and it remains optional for member states to monitor such impacts. This approach is justified by reference to the free trade principles of the World Trade Organization (WTO) and to the risks of legal liability if the EU is found to have promoted protectionist interests. This reflects the long-standing controversy over the prescription by customs unions, such as the EU, of standards aimed at regulating the methods of production of imported products (Charnowitz et al. 2008).[1]

Risks of water blindness

Motivated by growing concern over perverse incentives to convert from other land uses to large scale biofuel feedstock production, a body of research has set out to explore the impact of such production on land allocation, livelihoods and the environment (e.g. German et al. 2011). It is well known that the choice of crops for cultivation affects water consumption, and that many highly productive monocultures depend on a generous and timely supply of water. The demand for irrigation withdrawals increases the burdens on already strained aquifers (CWIBP-US 2008) and rivers (Falkenmark and Molden 2008).

However, where the wider environmental impacts have been studied, this has most often been based on priorities related to the conservation of biodiversity (e.g. Koh and Ghazoul 2008; Danielsen et al. 2008; Phalan 2009). Few studies have been conducted on the impacts on water resources. Such studies that do exist highlight the general lack of quantitative data and the likelihood that feedstock production will significantly affect water resources at the local and sub-national levels (Berndes 2002; Garg et al. 2011; Meijerink et al. undated). Furthermore, water is rarely accounted for in the analyses of mass flows contained in fuel energy and economic studies (Pereira and Ortega 2010). Recent global modelling results suggest that water consumption has been largely ignored in the assessment of global bioenergy potentials, leading to an overestimation (Beringer et al. 2011).

Above and beyond the need for baseline data on water use, there is a need to understand the governance and institutional aspects surrounding water resources and, also in the absence of accepted scientific data, how stakeholders set out to manage water. While there is a rich literature on water resource governance in general, only recently has the first work emerged which grapples with the governance of water impacts in biofuel feedstock concessions, focusing on the formal and informal functions of water-related institutions (e.g. Skinner and Cutola 2011).

Several water monitoring instruments have been developed for application to traded agricultural products. One example is the water footprint methodology, which assesses freshwater appropriation by activities or uses such as biofuel production (e.g. Hoekstra et al. 2011). These include lifecycle analysis and tools to assess "virtual water", that is, the volume of fresh water evapotranspired during crop cultivation "embodied" in traded food crops (Allan 1993; Würtenberger et al. 2006). However, while investors may be concerned to demonstrate their commitment to sustainable water management in their chains of custody, many retailers importing palm oil-based biodiesel to Europe have postponed the adoption of specific water standards and/or monitoring tools. Some of the contributors to the present

[1] A new sustainability standard for bioenergy to be launched in 2014 is currently being developed under the auspices of the International Organization for Standardization (ISO) (ISO/PC 248, by the project committee "Sustainability criteria for bioenergy"). It is a process-based standard and will not include minimum impact values, such as on GHG emissions, and thus will not qualify as an EU-RED sustainability scheme. However, as a global standard negotiated across customs unions it may be adopted in national legislation without risking non-compliance with WTO requirements, and thus facilitate trade between regions (see ISO 2010).

study explain that these standards are either not seen as sufficiently robust from a scientific perspective or not adequately supported by the relevant governing bodies or stakeholder forums, which potentially exposes companies to subsequent criticism.

In regard to public regulations in low-income producer countries in the South, many countries struggle with under-financed state institutions and often inadequately resourced decentralized governmental agencies. This means that policy implementation is generally weak, and undermined by a lack of enforcement and low institutional capacities (e.g. Osbeck and Powell 2009). A substantial body of evidence shows that governance functions and de jure resource rights are often not implemented in practice in conjunction with biofuel feedstock projects and investments (e.g. Skinner and Cotula 2011; German et al. 2011). In these situations, market forces will generally favour the use of foreign commercial investment to benefit the international market rather than smallholder production or supplying domestic needs (e.g. Schut et al. 2010).

Taken together, such knowledge gaps and uncertainties raise serious questions about the water resource impacts that arise as a consequence of the EU's increased demand for imported biofuel feedstocks, and how observations on the extent of these impacts could influence possible improvements in governance responses.

2.2 The Indonesian palm oil sector

Palm oil, the bulk of which is traded as crude palm oil (CPO), is one of the main substrates of biodiesel,[2] which accounts for over three-quarters (77.3%) of total biofuel consumption in the EU. Imports into the EU rose by almost 23% between 2009 and 2010 (EurObserv'ER 2010).[3] After Argentina and the United States, Indonesia and Malaysia are the largest exporters of CPO to the EU, exporting close to 341 million litres per year. This represents close to 3% of total EU biodiesel consumption (2009 data). Malaysia and Indonesia are the world's largest producers of palm oil, responsible for 90% of the world's palm oil production (USDA 2010).

The already extensive production for food, detergents and cosmetics has been fuelled by demand for liquid biofuels and to replace other food oils diverted for energy consumption (Corley 2009; Fitzherbert et al. 2008). Imports of palm oil to Europe doubled in 2000–2006, and palm oil is now primarily imported for the food industry to replace rapeseed oil, which is increasingly being used to produce biodiesel. The EU is the biggest importer of Indonesian CPO, followed by China. India is the biggest importer of processed palm oil, followed by the EU and China (Indonesian Chamber of Commerce and Industry 2006).

Governance legacy

The oil palm tree originates from West Africa. It was introduced to Indonesia in 1848 through a donation to the Botanical gardens in Bogor, just outside Jakarta. Later, a Belgian agricultural engineer discovered the potential of oil palm as a fast growing palm tree on Sumatra, where the tropical climate led to faster growth compared with trials in what was then the Belgian Congo. Large-scale investments in oil palm plantations in the Dutch colonial era turned Indonesia into the biggest exporter of oil palm by 1938. The colonial power

[2] Biodiesel is generally traded as FAME (Fatty Acid Methyl Ester), but new types of biodiesel are becoming more common, such as HVO (Hydrogenated Vegetable Oil).

[3] This increase is also subject to market fluctuations dependent on, for instance, annual climate and production variations. Furthermore, owing to its composition, palm oil-based biodiesel performs badly in colder climates such as northern Europe, and is therefore mainly used in southern parts of the EU (Swedish Energy Agency 2011).

introduced large plantations and grew oil palm for CPO extraction, primarily for export markets (Kiple 2000).

After independence in 1945, the government of President Sukarno focused on facilitating the transition from colony to independent nation by building a cohesive state in which a geographically dispersed archipelago could be united under the doctrine of Guided Democracy. His government was characterized by an isolationist view and created policies to promote import substitution, in contrast to the colonial era, which relied on technological inputs from the colonial power. The formerly Dutch owned plantations were slowly transformed into New State Plantation Companies (Colchester et al. 2006). The absence of the technical skills provided by the colonial power, combined with widespread smuggling and unfavourable exchange rates, made it difficult for the state-owned companies to maintain quality and develop the industry (Casson 2000). By the late 1950s, most of the plantations were state-owned and were investing in different crops such as coconut and soya beans.

The military seized power in 1966 and, under the leadership of General Suharto, Indonesia embarked on what is commonly referred to as the New Order. Under Suharto's regime (1966–1994), the state attracted massive investment from multinational companies and technical skills from abroad. In the first period of the New Order (1968–1988), part of the economic growth resulted from direct government investments in state-owned plantations. The state-owned plantations usually followed a Nucleus Estates and Smallholders (NES) pattern in which a company owns a refinery and an estate surrounded by smallholdings (Larson 1996). The second period, 1988–1994, saw the implementation of a joint government and private sector development scheme, which promoted the growth of smallholdings. In the following decade, the government supported private sector and cooperative investment.

Following the financial crisis of 1997, the New Order was influenced by the International Monetary Fund (IMF). The loans provided by the IMF were subject to structural adjustment, which often failed to take account of indigenous land tenure systems and the broader livelihood dependency on natural resources. A condition of structural adjustment was the enabling of CPO exports, as a reaction to the prevention of exports by the government in an attempt to protect the supply for use as domestic cooking oil. The role of smallholders weakened at this time. The disregard for indigenous land and resource rights that resulted from structural adjustment and government policies led to a widespread transfer of indigenous land rights and territory (*adat*) to corporate actors (Colchester et al. 2006). Nonetheless, local conceptions of *adat* rights still play an important role in many *Dayak* communities (the collective term for the indigenous peoples of Indonesian Borneo) (McCarthy 2007; Colchester 2011).

The social and private cooperative period coincided with a state-led migration programme referred to as the *Transmigrasi*, the purpose of which was to move people from the islands of Java and Bali, which were considered to be overpopulated, to remote and less populated islands. The *Transmigrasi* has played a pivotal role in the history of plantations in Indonesia. The number of smallholder estates expanded during the programme. State-owned companies and private developers prepared plots of land for smallholders. After three to four years, the plots (known as "plasma") were transferred to the smallholders, who developed them under the supervision of the developers, which were then required to purchase the oil palm and fresh fruit grown on them from the smallholders (Casson and Obidzinski 2007). Developments in labour mobility have led to a new form of private sector-supported migration on large-scale plantations (Marti 2008).

The oil palm sector has been further strengthened in the post-Suharto era. The government introduced policy measures such as the Decentralization Act of 1999, subsequently revised in 2004 as Law 32 on regional government. The Decentralization Act led to the devolution of land governance responsibilities to local government, thereby empowering the district governments, among other things, to pass district-specific legislation (Powell and Osbeck 2010; Casson 2000).

Today, state-owned entities, private corporations and smallholders produce palm oil in Indonesia. Between 2000 and 2005, the extent of smallholder plantations increased by 20% and of private plantations by 16%. According to the Indonesian Palm Oil Board, the estimated share of state-owned, privately owned and smallholder owned plantations in 2007 was 12 %, 53% and 35%, respectively (Indonesian Palm Oil Board 2007). The differentiation between private sector and smallholder plantations is less clear cut in reality than it is on paper, however, and the credibility and accuracy of the national statistics are contested.

In 2006, a National Energy Policy set national targets, including a target for biofuel of 2% of national energy consumption by 2010, rising to 5% in 2025, and a 20% target for biodiesel by 2025. These targets are also mandated in Indonesian Presidential decree no. 1 of 2006, concerning the Provision and Utilization of Biofuel as an Alternative Fuel, and no. 5 of 2006, on National Energy Policy, which sets a 5% target for biofuels in the transport sector by 2025. This expansion was to meet domestic targets on the reduction of GHG emissions and the demand for exports. Furthermore, Indonesia, inspired by Malaysia, has sought to facilitate a shift from exporting CPO to exporting processed palm oil, as a means to add value, although these efforts have not yet led to any significant change. In early 2009, only one biodiesel production plant was in operation (USAID 2007).

3. OBJECTIVE AND METHODOLOGY

Recognizing the limited understanding of how EU imports of biofuel products affect water resources and their management in producer countries, SEI and its partners decided to undertake a pilot study to explore the impacts on water resources arising from biofuel feedstock production, map any ambiguities in how diverging claims are reconciled, and examine how the governance system can be improved. The study focused on two key research questions:

1. Which water-related impacts and risks arise from biofuel feedstock operations?
2. How does the current governance system manage these impacts and risks?

These questions were explored using a qualitative case-study methodology based on the principles of participatory action research. This aimed to provide a range of stakeholders, with equally legitimate perspectives on water resource management in biofuel feedstock operations, with an opportunity to comment on what they believe to be the most pertinent risks and impacts, and to critique the performance of current governance mechanisms.

The analysis presented below does not aim to either prove or disprove the "sustainability" of palm oil as a biofuel feedstock. Rather, we have facilitated a multi-stakeholder analysis of the current mode of production, allowing people to express *their* views regarding its sustainability and impact on water resources. The study thus set out to identify how contested views on impacts and divergent definitions of risk are incorporated into the management of biofuels production, and to reveal whose perspectives and interests influence biofuel feedstock production. In so doing we acknowledge that valid information can be derived from a range

of sources, including scientific impact assessments, the practical knowledge of professionals in government, business, NGOs and the personal experiences of the people affected.

3.1 Case study selection: Palm oil production in Central Kalimantan

A case study methodology was chosen to elicit relevant and rigorous qualitative information to answer the above research questions. Case study methodologies are qualitative research strategies. They are particularly relevant for the examination of complex questions with a high degree of uncertainty or controversy that require attention to be paid to social contingencies. In contrast to quantitative research strategies, which seek to produce generalized accounts of reality to dictate rules for action, case study research is more valuable in promoting learning that appreciates the contextual dependency of such rules. The present study thus takes an action research approach in which the rigour of the work depends on its ability to adequately account for the complexity of the local context and the diverse perspectives and interests of the stakeholders (Larsen et al. 2012).

The case selected was the production of palm oil in Central Kalimantan Province and the Mentaya and Seruyan River Basins in Indonesian Borneo. The case study sites are characterized by multiple stakeholder groups that represent diverging views on the sustainability of palm oil plantations. We do not claim that this area is representative of palm oil production in the whole of the Indonesian archipelago, or of all the other feedstock production contexts of importance for EU consumption. The "case" is not primarily a physical or institutional configuration, but is intended to serve as a learning "platform" (Steyart et al. 2007), or an opportunity for new meaning to emerge regarding governance weaknesses and institutional innovations.

Figure 3.1. A plantation surrounding Pondok Damar village

As is noted above, the Indonesian palm oil sector is one of the longest established agro-industries for vegetable oil, with potential as a biofuel feedstock. It has a long history of production, which provides an opportunity for new and emerging producers to learn from its accumulated experience. This study aims specifically to build on past work, including recent field investigations assessing progress with the use of High Conservation Value Areas (HCVA), undertaken with the Roundtable for Sustainable Palm Oil (RSPO) (e.g. Colchester et al. 2011), and the functioning of the RSPO itself (Levin 2012; Schouten and Glasbergen 2011). The RSPO provides the leading voluntary sustainability standard specifically for palm oil products. The organization was founded in 2004 and had 250 members in 2011. The first RSPO-certified Sustainable Palm Oil (SPO) was available on the market in 2008. By 2011,

close to 5 million tonnes of SPO was being produced annually by 26 certified growers, which was close to 10% of global CPO production (RSPO 2012).

As a pilot study, we believe that the main added value from this work is the findings from the field assessment. We refer to previous works for a more comprehensive review and analysis of the formal legislative and policy environment, including that pertaining to land tenure and forestry (e.g. Casson 2000; Casson and Obdinzki 2002; McCarthy and Zen 2010; McCarthy et al. 2012).

One further motive for selecting the Central Kalimantan palm oil industry as a case study was the communication of grievances by the local communities, reporting on severe water-related impacts of oil palm plantations. These complaints were previously investigated by two of the collaborating organizations in this study, WALHI Central Kalimantan and Sawit Watch (e.g. Walhi Central Kalimantan 2010). They subsequently invited the Stockholm Environment Institute to participate in examining how community grievances have been addressed by the public and private sectors. This provided an ideal opportunity to inquire into the performance of existing governance mechanisms.

3.2 Theoretical framework: governance and water claims

The underlying assumption of this study is that governance of water resources in biofuel feedstock operations – and indeed in most agricultural activities associated with land use change – must be prepared to recognize and respond to intractable uncertainty and controversy regarding what comprises "optimal" or "desirable" water management. The role of governance is to mediate competing claims on water resources and their desirable uses, through enabling institutions and processes, and to support the greatest possible level of non-coerced collective action. This means that water resources must be approached not simply as a bio-physical entity, but as a "mediating object" (e.g. Ison et al. 2012), that is, a socio-technical entity, which resource users and managers construct through their words and actions, invariably inserting their own interests and perspectives.

This view recognizes that stakeholders are public sector, private sector and civil society actors, who actively construct and promote their own stakes in the water resources and influence the stakes of others. The Boulding Triangle (see figure 3.2) exemplifies this understanding that governance is not limited to public policy but, particularly in agro-industrial markets and international trade shaped by low implementability of public legislation, often more determined by the actions of private sector and civil society representatives (see also Powell et al. 2011).

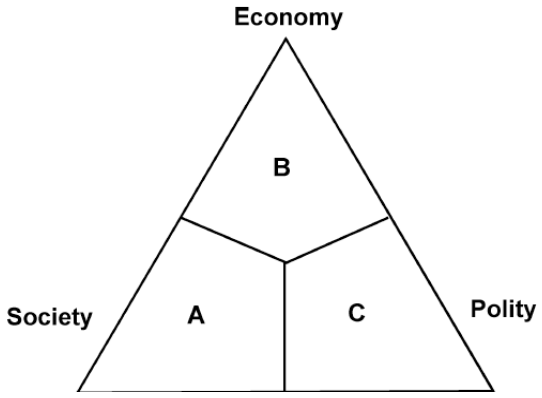

Figure 3.2 The Boulding Triangle

Source: Boulding 1970

This approach is also inspired by advances in the so-called political ecology of water, whereby the focus is shifted beyond the physical boundaries of a watershed to the "problemshed" as defined by different stakeholders (Mollinga 2008). River basins are then viewed as contested "objects of development" (Sneddon and Fox 2008: 67), with the potential for both conflict and cooperation between the state and communities, and companies and civil society, revolving around access to and the exploitation of water resources.

Above and beyond contributing to filling a gap in the knowledge of the consequences of biofuel feedstock production, specifically for water, the emphasis on water resources provides an opportunity to assess livelihoods impacts in a wider sense. In the context of sustainability science (e.g. Turner et al. 2003), water is just one of the environmental conditions (natural capitals / biophysical endowments) that comprise the requirements for sustainable livelihoods. However, just as energy is essential for the modern economy, water is the lifeblood of human societies and ecosystems and as such functions as a powerful proxy for environmental sustainability and social equity. In low-income contexts this includes food security and poverty alleviation.

3.3 Data generation: Stakeholder identification, consultation and feedback

The primary data in this report are derived from an action research process that took place over an 18-month period, with additional data generation undertaken during October 2011 and October–November 2012 in Central Kalimantan Province, focusing on field study sites in Seruyan and Kotawaringin Timur Districts. Interviews and focus groups were held in the three villages of Pondok Damar, Sembuluh and Terawan, in Sampit; the district capital of Kotawaringin, Timur; Palangkaraya, the capital of Central Kalimantan Province; and Jakarta, the Indonesian capital. Conversations were held in Bahasa, with translation, or in English.

A preliminary list of possible contacts was prepared before the fieldwork began, and WALHI Central Kalimantan and Sawit Watch requested meetings with these contacts. Requests were made by letter (see annex 1) and meetings were subsequently arranged with those who responded positively. In total, the study received contributions from 17 people from three villages (village heads, plantation workers, farmers, fishermen, etc.); 17 government officials (agency directors, office heads, desk officers, field staff) of nine agencies at the district, province and central government levels; seven Chief Executive Officers and managers from four private sector organizations (including growers and buyers); 11 staff members (directors, programme managers and field staff) of five civil society organizations at the district, province and national levels; and three staff from two research institutions (research insights were generally incorporated through a secondary literature review). (See annex 2 for a complete list of contributors.)

Organizing interviews with the growers operating at the field sites was a particular challenge. Two meetings were scheduled with growers based in the sites, but these were subsequently cancelled owing to miscommunication and changing schedules. After the conclusion of the fieldwork, requests were sent by mail and email to six principal growers operating in the field sites visited in Central Kalimantan. Follow-up calls were made by telephone but without obtaining a reply. A telephone interview was conducted with representatives of the only grower to reply, who asked to remain anonymous.

Consultations followed a semi-structured, open-ended interview format, in which the participants had an opportunity to direct the conversation. All the meetings followed a similar agenda, with specific questions defined in advance of each meeting, drawing on insights from previous meetings and the knowledge of the person and organization in question:

1. A general introduction of all present and an introduction to the purpose of the assessment.
2. An exchange about the general positive and negative impacts on livelihoods of palm oil plantations.
3. Learning about the water resource impacts arising from palm oil plantations, which the people present had either observed or otherwise knew of, including identifying available evidence of such impacts.
4. Learning how the existing governance system is expected to manage these impacts, that is, through public legislation, law enforcement, voluntary action, certification schemes, and so on, and how these mechanisms work in practice.
5. Advice on the next steps and how the assessment could best contribute to ongoing work.

Primary data from the interviews and focus groups were documented in detailed field notes, capturing the main arguments and insights from each interviewee/contributor. Notes were taken during the interviews and revised through immediate debriefs, in which the team members cross-checked their separate notes and interpretations. The analysis was complemented by secondary information retrieved from literature reviews prior to and following the fieldwork, including information from key informant interviews with Swedish and European government officials, companies and NGOs involved in the renewable energy market (see annex 3). Relevant secondary information was retrieved based on the types of information and references which stakeholders used to substantiate their claims, such as legal documents, policies and strategies, reports, research articles, and so on.

During the fieldwork, quantitative water data were requested from district and provincial Environment Offices, but they were unable to make such data available. It was explained that, owing to a shortage of funds, monitoring data are extremely scarce or even completely lacking for most of the province. This represents a significant challenge for informed water management. More information is provided on this aspect below.

In communicating the information from the contributors, we have adhered to a code of conduct in which we expressly requested permission to include interview information in this report and, if necessary, to make direct attributions to informants. Since several of the contributors did not feel confident about being identified personally, we have only made direct attributions if permitted and this adds significant value to an understanding of the data. We have otherwise withheld the identity of contributors.

A draft version of this report was shared with contributors to the study who had Internet access and a proficiency in English, during a one-month review period (5 July–5 August 2012). Substantial comments were received from five contributors, including one grower and one buyer of palm oil. A subsequent field visit (27 Oct.–3 Nov. 2012) was undertaken to present the draft report to the contributors in Central Kalimantan Province. This also served as an opportunity to explore possible joint actions related to the recommendations emerging from this study. Comments were received from ten villagers, one district politician, one association of plantation companies and six agencies, including in a seminar convened by the Provincial Government. At these meetings, people helped correct some minor errors (especially regarding translation) but confirmed the general validity of the key findings and recommendations.

3.4 Introducing the field study site

Central Kalimantan in Bahasa (colloquially abbreviated to *Kalteng*) is one of Indonesia's 33 provinces. It is inhabited by close to 2.2 million people and covers 13 river basins and 150 000 km^2, stretching from the south coast of Borneo, over the lowland plains drained by a large number of rivers and streams to the central highlands in the heart of Borneo. Much of the lowlands consist of peat soils. Kalimantan, with Sumatra, has the majority of Indonesia's peat soils, which jointly account for over 80% of the peatland in South East Asia (Someshwar et al. 2008). This was one of the reasons why Central Kalimantan Province was chosen in 2010 as a pilot province for the Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD+), with funding from AusAid. It is also one of the provinces covered by a two-year moratorium on the issuance of new permits for the conversion of primary forests and peatlands for further logging and the expansion of oil palm plantations under the Indonesian government's 2011 agreement with the government of Norway.

The province, comprising 14 districts in total, is administered by a Provincial Government chaired by the Governor. The two districts of Kotawaringin Timur and Seruyan cover about 50 700 km^2 and 16 400 km^2, and have around 500 000 and 108 000 inhabitants, respectively. Kotawaringin Timur is the largest district in the province, but the second-least populated. Seruyan is a relatively new district, created in 2002 in connection with the implementation of the Decentralization Act. Since its creation, the district has been under the rule of the same District Regent (or *Bupati*), who has led the district government for two mandate periods.

Diverse migration patterns and external influences have led to a highly complex system of cultures in Borneo. The area is mainly populated by indigenous *Dayak* and migrants from East Java and South Kalimantan, which they left as part of the Suharto government's *Transmigrasi* programme. Many moved to Central Kalimantan during the logging era in the late 1980s. Relationships between the *Dayak* communities and outsiders date back to the New Order regime's transmigration period, and before that to the Dutch colonial period, which was often characterized by struggles for land and resources. In 2001, tensions between the *Dayak* and the *Madurese* people turned violent, resulting in a large number of deaths on both sides (Smith 2005).

Human settlements were traditionally located along the rivers, which were used as a means of transport and subsistence, and the many villages and towns that were not relocated in resettlement programmes remain in these locations. Spatial planning, including administrative boundaries, original patterns of human settlement and the location of cities and towns as trading points, is strongly influenced by the river systems and watersheds (see also Casson 2000). The two districts' administrative boundaries roughly coincide with the boundaries of the Mentaya and Seruyan river basins. The Seruyan River is one of the major river basins in Central Kalimantan, and the western-most river in the Kotawaringin Timur Regency.

Central Kalimantan Province is heavily dependent on extractive industries and the exploitation of its natural resources, such as forests. Oil palm plantations, gold and coal mining, timber concessions and rubber estates are the main land uses. In the lowland tracts of the province, the extensive logging and oil palm plantations were preceded by other extensive land uses, such as Suharto's Mega Rice Project which unsuccessfully sought to convert peatland and wetlands to rice cultivation (e.g. Ludang et al. 2007). The province has suffered the highest rate of deforestation and forest degradation in Borneo, chiefly owing to logging and the expansion of extractive and agro-industries, such as palm oil (Broich et al. 2011). It is also the province which saw the fastest expansion of oil palm plantations in the country. Oil

palm is an important business, but timber and mining are even greater sources of revenue. An important incentive for the operation of oil palm plantations is thus the tree clearance and cutting prior to the initiation of the plantations (Casson and Obidzinski 2002). The transition to plantation-dependent economies in the districts partly reflects the exhaustion of timber resources and the need for alternative ways to use the land (Casson 2000).

This assessment examines the situation in three villages in two river basins of the Central Kalimantan Province (see figure 3.3). Pondok Damar village is located in the sub-district of Mentaya Hilir, in Kotawaringin District, by the Tebelian Tusang River, within the concessions of PT. Mustika Sembuluh. The village has about 300 households and over 900 inhabitants, and has been in its current location for 23 years, since resettlement organized by the Department for Social Affairs (Colchester et al. 2011).

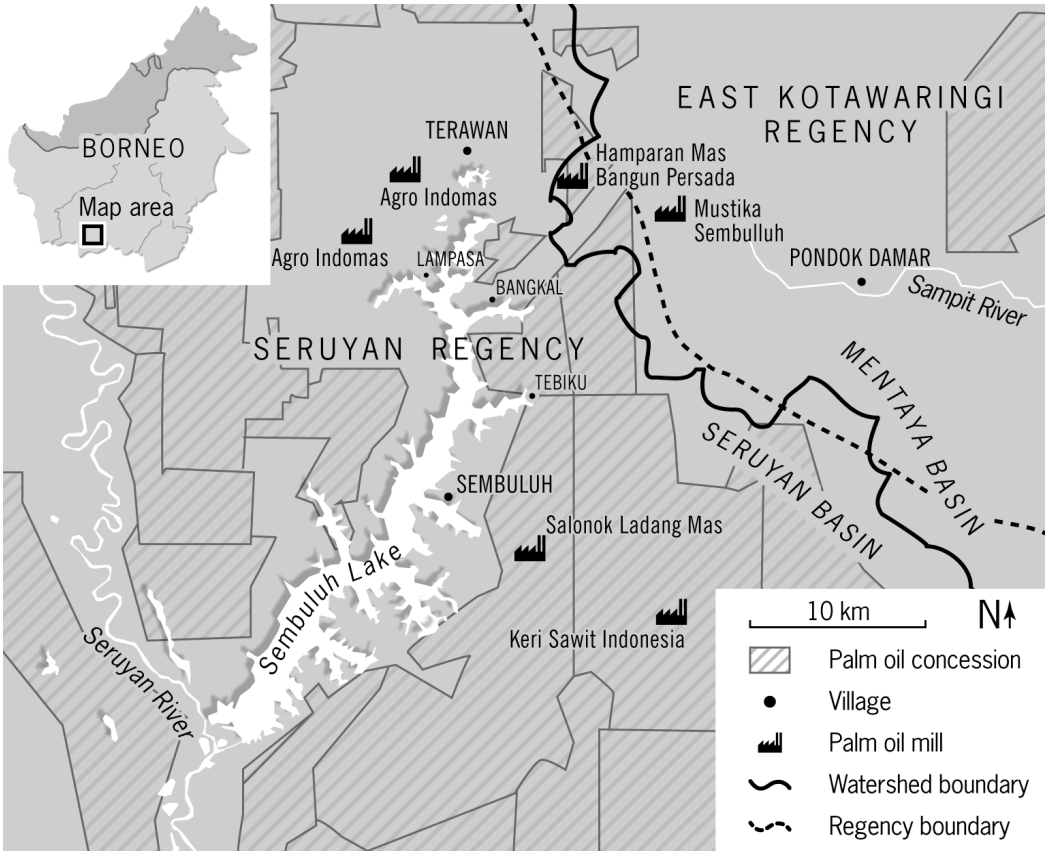

Figure 3.3. Map of the field study sites

***Note*: This map shows the villages visited for this study as well as other major settlements in the area, but not the full extent of human settlement around the shores of Lake Sembuluh or along the rivers in the two river basins. The official extent of the palm oil plantations is derived from Dinas Perkebunan (2010), although, as is elaborated further below, the credibility of official data on the oil palm concessions is contested. Location of palm oil mills is derived from WALHI Central Kalimantan (2010).**

Produced by Nordpil

Terawan village is located in the sub-district of Sembuluh in the Seruyan District. It has about 250 households and a population of around 950. Today, close to 250 men are employed as labourers on the plantations, and around 130 people report that cultivation of rice or other crops is their main livelihood. Fewer than 20 households rely mainly on fishing. In terms of

their involvement in the palm oil plantations, like elsewhere in Borneo the villagers are mainly engaged in the nursery years, growing the seedlings and young trees. The majority of skilled labour for the latter stages of cultivation is imported from Java.

Sembuluh village is situated by Lake Sembuluh. Two adjacent villages, Sembuluh I and II, together are home to 1200 households and 4600 people. The vast majority of the population depends on income from labouring on the plantations, but around 400 mainly depend on rice and crop cultivation and another 600 are engaged in service delivery. Six palm oil mills have been operating in the lake area since 2000. In 2008, PT. Hamparan Mas Bangun Persada, a plantation company, started construction of a new mill just upstream of Sembuluh village (see also WALHI Central Kalimantan 2010).

4. SYNTHESIS OF THE RESULTS

This section sets out the primary evidence from the fieldwork. It is organized in two parts. The first is a narrative of the impacts on water resources, as communicated by different stakeholders. It reflects our journey of inquiry, starting with the field visits to the three selected villages and proceeding "upwards" through the governance system by mapping the views of the district, provincial and national level actors consulted.

The second part appraises the set of so-called governance mechanisms, that is, the formal institutional and legal structures that are expected to ensure sustainable water use in the palm oil plantations. We focus on six such mechanisms that emerged as the most pertinent from the point of view of the stakeholders consulted, or on which we gathered the most information during the consultations. This provides a set of entry points for understanding the systemic issues of the regime as demonstrated in the localities studied. For each of the mechanisms we briefly introduce its intended function, based on secondary data and legal references, and summarize the critiques of its performance as experienced by the contributors to the study (i.e. the stakeholders interviewed).

4.1 Stakeholder observations on water resource impacts

The grievances of three affected villages

In **Pondok Damar**, the villagers shared that they originally practiced agricultural rotation complemented by fishery, hunting and gathering. The emergence of the logging industry limited access to the forest and changed people's livelihoods. In the early phase of logging and establishing oil palm plantations, they had used land for planting rubber and growing food crops, including vegetables, rice and fruit. By 2004, most of the forest had disappeared and been replaced by plantation concessions. Oil palm plantations were rapidly established in what had previously been forest and communal land. Most of the villagers consulted followed suit and began planting oil palms in their gardens. This caused deterioration in soil quality through compaction, root infiltration and a general drying, preventing its use for crop production.

When asked why they had given up their original subsistence farming, the farmers responded that they had seen a business opportunity that merited immediate engagement. One farmer noted that he had increased his monthly savings from IDR 150,000 to IDR 250,000 and that his workload had diminished compared to farming food crops. However, other farmers described that it was only afterwards that they realized that the land use changes around their village and in their own gardens were irreversible, at least in their lifetime. They had undermined their food self-sufficiency and made themselves dependent on purchasing

virtually all their agricultural and food produce. Two farmers explained that some villagers are now employed in the nearby plantation, but many – like themselves – are not qualified as they do not have the required school certificate. Rejected by the plantation managers, they instead try to make a living from catching and selling wild pigs or as casual labourers when opportunities arise in the village. In the almost complete absence of food crops, villagers are highly dependent on the streams and rivers near the village for the collection of wild vegetables.

Village inhabitants previously depended on drinking water from the nearby Tebelian Tusang stream (see figure 4.1). Shortly after the extensive land clearances and the establishment of palm oil plantations in 2003–2004, they observed the first signs of water pollution and started to rely more heavily on their wells for extracting groundwater. These wells were constructed in 2005 by the villagers themselves without government involvement. As the village headman stated: "In the dry season there is almost no water in the river, and in the rainy season people cannot consume the water; it is polluted… and they get skin diseases. It is related to the palm oil mills. The water also changes colour. Now the groundwater is better." The scarcity of good quality water means that the groundwater from wells is now used for laundry and other household purposes. Those villagers who are fortunate enough to have natural springs in their gardens have seen their neighbours start to extract water from these too.

Figure 4.1 The Tebelian Tusang stream during the dry season

Pollution in the Tebelian Tusang stream was reported to the District Environment Agency in Sampit by villagers in Pondok Damar. The main source of pollution, according to the villagers consulted, is the nearby palm oil mill operated by PT. Mustika Sembuluh. The village headman showed the research team a film produced by a local journalist, with shots from the polluted stream, its murky water, dead fish and children with skin rashes. The film was shot during a formal visit by the District Environment Agency, representatives from PT. Mustika Sembuluh and members of the district parliament in 2008, when the village headman called for action to improve waste management and ensure the provision of clean water for the village. The District Environment Agency took water samples and the analysis led to recommendations to the company to compensate the villagers by providing a water supply system. Threatened with wider demonstrations and protests, the company managers took responsibility for the pollution and promised to provide a water delivery system to the village. The villagers drew up their own preferred design for the water supply system, but the company decided to adopt another design, which was subsequently implemented.

This system has proved fragile and requires frequent repairs to the pipes. The villagers consulted complained that, even when functional, the pipes are too narrow and do not provide an adequate flow for household needs. Five households share one decentralized tank, which is hard to access owing to its location on an elevated platform. After repeated problems with broken pipes, the villagers complained about the water facility and requested an alternative solution. However, the company stopped repairing broken and blocked pipes, and halted the supply of water from the nearby stream to the central water tank. This has forced villagers to return to their reliance on wells and to walk 400 metres upstream to a river tributary located off the concession area, where the water is still drinkable. Some villagers also search for water inside the plantation area, for instance, in a nearby excavation site, but they are concerned about its quality and risk being turned away by plantation staff.

The village headman noted that, in terms of waste management, the company had taken action to redirect palm oil mill effluent (POME) from the stream to the plantation area, but that the problem of run-off from the plantation remains, especially in the rainy season. In addition, the construction of waste ponds for the mills in 2005–2006 has led to a permanent disturbance of the river, as it changed the water course.

The villagers consulted acknowledged that the situation was not "black and white" when it came to identifying the causes of water pollution. Although they believed that the main source of the pollution was the POME, logging and the drainage of the forest area had also increased releases of organic matter into the river. In addition, village farmers also apply pesticides and fertilizers to their plasma plots. There is no capacity at the village level to monitor or guide the management of the smallholder concessions and farmers do not receive guidance on the responsible application of pesticides and fertilizers.

Sembuluh village is located immediately downstream of five large palm oil mills on the shores of Lake Sembuluh (see figure 3.3). The consulted villagers shared that prior to the establishment of the concessions, the majority of the inhabitants were engaged in farming and in fishing the lake. As an estimate, close to 80% of the land surrounding Lake Sembuluh belongs to the companies. Only 20% remains under the control of the villagers. Some food crops are still grown, but many have used their remaining land to grow oil palms. Rice is still cultivated some kilometres south of the village in the immediate vicinity of the lake shoreline, but the quality of the soil there is unsuitable for rice farming. Before the arrival of the plantations, rice cultivation, and fruit and vegetable growing took place on community land, and some rice fields were located up to six hours away on foot from the village. Now this land has been appropriated by the concessions and agricultural food production has been significantly reduced. Several former farmers shared that they had previously been engaged in agro-forestry, but have now lost their land as it was grabbed by the plantation companies.

The villagers consulted complained that there was a lack of plasma allocation from the companies, even from Wilmar Group subsidiaries which are RSPO-certified (see section 4.2.2 for the explanation provided by local government). Some people have given up farming and fishing to labour in the plantations, but their salaries are not sufficient to support a household. One former farmer commented: "When the plantations came, they said many locals will get a job, but only a few people have so far." A group of boat workers explained that prior to the arrival of the plantations, they had had a solid income from building large wooden boats, which were sailed to the sea and sold in Pembuang, the capital of Seruyan District. However, they have had to halt their activities owing to a lack of wood and timber, and to try to find work in the plantations or other casual labouring jobs. The clearing of the forest for the plantations removed many sources of wood and although the company does not directly

prevent people from logging and collecting wood from what has now become concession land, the police prevent it and accuse people of illegal logging activities on company land.

Altogether, the constraints imposed on land-based livelihoods and opportunities have led to a greater dependency on the lake and aquatic resources (fishery, gathering wild plants, etc.) (see also figure 4.2). Fishermen are typically organized in groups of five or six people per boat, and set long nets in the lake. They fish the lake in the dry season, and in the wet season they may fish the streams and used to fish the river. According to the fishermen consulted, there is no regulation of the size and type of nets, who is permitted to fish or the intensity or quantity of the catch. People with a boat are entitled to organize a crew and participate in the fishing. The daily catch can reach 100 kg, principally for consumption or to be sold to small traders, or in the markets in local towns or the labour camps for plantation workers.

However, the use of the aquatic resources in the lake and the river is now threatened by water pollution. Several men and women involved in fishery noted that the average size of the catch has significantly decreased since the establishment of the plantations. They have also observed a growing number of cases where only degraded, rotten or simply skeleton remains of fish have been found in the nets. In general, fishing the river has ceased due to the disappearance of fish stocks and the deterioration in water quality. This has also reduced the number of people engaged in fishery in the village. A group of fisherwomen shared that cage cultivation, supported by international donors, is no longer productive because the caged fish are likely to die. Repairing the cages and nets is complicated by the accumulation of foul smelling grease and sludge. This grease was also observed as sediment in parts of the lake, causing a general increase in the turbidity of the waters. This pollution has also led to skin diseases, and increased difficulty in obtaining clean water for household purposes such as laundry and personal hygiene. In most of the area, it is now impossible to collect plants, such as rattan, from the river as certain species have disappeared and the vegetation is covered with grease and sludge.

Figure 4.2 Fishery in Sembuluh Lake

Villagers can no longer use water obtained from streams and rivers in the area for drinking. The local state-owned drinking water utility company (PDAM) initiated deliveries of drinking water in 2009. This supply complements the wells in the village, which run dry during the dry season. The chemical water treatment relies on chlorine, and villagers are concerned about the health implications of long-term consumption. Running water for each household is only available in the evenings, and there is dissatisfaction with the ability of PDAM to respond to villagers' needs.

The villagers consulted link the pollution and resource problems to the operation of the plantations and the palm oil mills. The mills rely on the supply of water for their processes

and, despite the construction of waste ponds, many overflows into the river and streams have been observed during the rainy season. Furthermore, POME is transported through an intricate network of pipes, and the villagers are convinced that some of these pipes are releasing effluent into the lake, river and streams. This suspicion is partly founded on repeated observations of non-compliance with government regulations, including plantation companies not respecting riparian zoning requirements to protect the water courses and the lake shoreline. It was observed that companies have even drained, and planted oil palms in, the shallow parts of the lake – areas which were formerly community areas (compare the official concession permits shown in figure 3.3 above).

In 2010, PT. Salonok Ladang Mas of the Union Sampoerna Triputra Group (USTP) commenced construction of a new mill by the Gerunggang and Tetawe Rivers, close to 1 km upstream of Lake Sembuluh, immediately north of the village. These tributaries of the lake are still deemed by the villagers to be of acceptable quality for the provision of drinking water. Based on their accumulated frustrations with pollution from existing mills and worried about the increased efflux of POME, the villagers opposed this development. After repeated protests, the Provincial Environment Agency collected samples from the lake and the rivers, but the results were not shared with the village. However, the consultant responsible for water samples associated with the construction of the new mill confirmed the presence of pollution in the upper part of Lake Sembuluh. Salonok Ladang Mas offered to provide clean water to the affected people and a memorandum of understanding was signed. However, the villagers have not yet seen any action by the company in this regard. When it was discovered that the company did not intend to undertake a new environmental impact assessment (EIA) in conjunction with the planned new mill, but only to amend existing documentation, local NGOs organized a complaint to be filed with the Provincial Governor (on EIA legislation see section 4.2.4). The construction of the new mill was suspended by the Provincial Governor pending further investigation.

Like the villages of Pondok Damar and Sembuluh, the consulted inhabitants of **Terawan village** described how they are faced with significant water quality issues, and are now dependent on supplies of fresh water from the plantation company, PT. Agro Indomas. Fish stocks in the river decreased when the nearby mills started operating in 2001. In the period 2002–2004 it became clear that water could no longer be collected from the stream because water quality had deteriorated. Prior to the establishment of the mills, most of the villagers were fishermen. Now, only a few are engaged in fishery activities. Some, mainly women, work in the plantations nearby and some villagers are also engaged in mining activities. Farming has virtually stopped. As an estimate, close to 20 000 ha of what was previously community land used by the villagers was appropriated for the plantations. Of the total population, only 30 households received plasma.

Protesting about the growing impact on local water resources (see figure 4.4), the villagers submitted a letter to the District Government complaining about mill waste, but the District Government did not react and only in September 2011 did the *Bupati* visit the village. One villager explained: “He said that the government will solve the problem with the mills, ‘just wait and see’, he said, ‘be patient’. But people are not convinced and it has been a long time with trouble now.” Faced with what they saw as the blatant disregard of the District Government, the villagers submitted a complaint, communicated via local NGOs, to the Provincial Governor. As yet, the only reaction has been that the Provincial Environment Agency has taken samples from the river as part of its investigation of the complaint from the nearby Sembuluh Village (see above). In 2004, Salonok Ladang Mas initiated the supply of water to the village based on a negotiated agreement between the concession managers and

the village council. The water supply comes from the same river, but is mechanically cleaned before delivery.

Figure 4.3 Impressions of the Rungau River by Terawan village

Comments from the private sector

On learning of the complaints from the consulted villagers, executives from one of the **growers** operating in the watersheds of the affected villages acknowledged that there are unfortunately "rotten apples" in their business sector, and that some companies in the area are disposing of POME directly into the water course, despite the fact that this is illegal. They called on the local government to play a more proactive role in enforcing regulations but noted that: "law enforcement unfortunately rarely works well in practice … thus the industry must take all initiatives". The executives described the water use and water management practices in their plantations. Only nurseries are irrigated and the only other water use is for processing the harvest in the mills. They assured us that there is no discharge of POME into the river courses, and that wastewater is treated before it is recycled on to the plantation estate. Palm oil mills are required to treat effluents in open ponds for aerobic digestion of organic matter to reduce the biological oxygen demand (BOD) below 5000 ppm, which is the legally required threshold. However, the company goes further and uses so-called anaerobic aeroflow systems to bring the BOD below 100 ppm, which would allow them, according to national regulations, to discharge it into the water course. Nonetheless, the company retains all wastewater on the plantation, because the recycled water has a high nutrient value as fertilizer for oil palms. Pesticides are not used to a great extent once the palms are mature, and in that case only herbicides, which have a short lifespan in the soil. The company aims to apply best agricultural practices to prevent erosion and pesticide leaching, including in riparian zones, as well as selective weeding. In the early stage of planting, they also sow leguminous crops in order to prevent erosion, indirectly reduce the need for weeding and promote nitrogen fixation. In the riparian zones they plant local species in order to preserve the area.

A sustainability manager working for one of the world's major **buyers** that sources CPO from Central Kalimantan explained that it is a basic premise when operating in Indonesia to acknowledge that no plantation is unproblematic: "If a plantation has 'manageable issues' – in Indonesia everyone has issues – then [our company] proposes a workplan to address these issues…". However, he noted that smallholder production is typically comprised of families who are unaware of sustainability certification systems, and that they are the real "agents of

exploitation", with up to 1 million ha operating illegally nationally. The sustainability manager also commented that it is important to acknowledge the great diversity in plantation schemes across Indonesia and that Kalimantan is not necessarily representative of the production contexts on other islands.

Staff at the **RSPO liaison office** in Jakarta outlined the eight principles and 39 criteria that certified growers have to comply with in order to market their CPO as Sustainable Palm Oil under the RSPO label. Three of the criteria focus explicitly on water resources and others are significant due to their emphasis on, for instance, environmental services and good agricultural practices. There are weaknesses in enforcing public regulation today, and negotiated and voluntary agreements such as the RSPO's can often be more effective than regulation because they are market-driven and offer financial incentives to companies. RSPO certification of a concession is valid for five years, and annual surveillance assessments provide an opportunity to tackle minor non-conformities and a chance to update the certification if production has changed. It was explained that the RSPO believes in continuous improvement and gradual learning on behalf of those involved.

Comments from civil society

The five **local NGOs** that participated in the focus group discussion in Palangkaraya recounted many observations, from a number of locations throughout the province of Central Kalimantan, of impacts on both the quality and the quantity of water. The observations were generally aligned with the experiences communicated in the village visits: (a) land clearances, erosion and run-off from plantations leading to turbid and murky water; (b) the release of toxins into the water bodies from plantation spraying of pesticides, eventually causing fish deaths; (c) POME and other palm oil waste being dumped or released into rivers and streams; (d) overflowing of waste dams during the rainy season; (e) a reduction or redirection of water flows owing to channel and dam construction for plantations; (f) floods owing to de-forestation, which increases flows and the risk of flash floods in the rainy season; and (g) drying out of community land adjacent to plantations and a lowering of the water table, forcing villagers to give up traditional rice farming and work instead in oil palm production. In many cases, these impacts eventually lead communities to rely on distant water sources or company water provision, establishing a relationship of dependency with these companies. A high level of frustration was expressed towards companies and local government, which were seen as exploiting villagers for personal gain. As one participant noted: "government officials and companies have collaborated on … the policy for palm oil without the involvement of local people… it stigmatizes the people and materializes them, and leaves them powerless in the face of the patronage of government and the private sector". There were many cases of personal, direct observation of specific point source pollution from POME releases, waste dumping, and so on. However, it was generally acknowledged that pollution could have many sources and it was difficult to single out the specific contribution of oil palm concessions from sources such as mining and household waste. Community-led illegal mining is a serious concern, combined with large-scale extractive industries that release heavy metals into the rivers. At the conclusion of the meeting, one participant *observed:* "We appreciate that [European researchers] visit us to inquire into the impacts of palm oil production arising from European demand. But what do communities in the EU do in response to this situation? Much information has already been given to the EU: Lots of films and data have been taken. But what do they do?"

The coordinator of the Indonesian university and research network, Collaborative Knowledge Network Indonesia **(CKNet-INA)**, described how oil palms may survive with "wet feet"

(roots in groundwater) for a few days, depending on the variety, but generally require dry soils. This means that there is an interest in draining the soils and maintaining the correct water level. On hearing villager's concerns about water pollution, the coordinator explained that peat soils contain Ferrous sulphate, which when released is highly oxidizing and can even degrade concrete. When peatland is drained, it remains in the soil even after the organic matter has been oxidized. Peat soil typically contains 75% organic and 25% inorganic soil particles, so when the organic matter is reduced through oxidation the remaining soil becomes increasingly acidic and toxic. In addition to the possible impact from pesticides and toxins from other types of activities, the draining and reclaiming of peat soil leads to acidification, which could be a chief source of the pollution experienced by villagers. These peat toxins can travel in the water bodies over long distances from upstream areas.

Staff at **Tropenbos Indonesia** (a Dutch-based research and capacity building NGO with an office in Bogor) described how oil palms need more water than other species of trees, and very high volumes when they are young. This means that they will absorb water from upstream areas and that downstream areas may be negatively affected. Water serves as a "lock" in the natural system of the peatland dome. Drainage canals for the plantations will invariably open this system up, disturbing the peat hydrology. It was stated that there is no real impact on water management if a single plantation is well managed, since there is only a need to manage water at the landscape level. Determining the exact causes of water pollution requires continuous monitoring of water quality before, during and after the transition to a plantation, including capturing seasonal and annual variations. Despite the risks outlined above, it was emphasized that the palm oil industry provides livelihoods options for smallholders and a demand for labour – even more than the forestry sector. Several districts and provinces have improved levels of economic development linked to palm oil concessions, although not all. The only industry more lucrative than palm oil is mining, which is much more destructive and short-sighted. If palm oil production were not an option, there would be a need to identify economic alternatives for both communities and companies. There are different groups in every community, some of which benefit while others do not.

Comments from government officials

The Director of the **District Environment Agency** in Sampit and his staff explained that the main causes of water pollution in the district are, ranked in order of importance: (a) illegal mining; (b) household waste; (c) accidents with POME releases from mills; and (d) poisons used by fishermen. Illegal mining is principally undertaken by local people, who hope to extract minerals such as gold and sirkon without permits. When there are accidental POME releases from mills or run-offs from plantations into lakes and rivers, the agency warns people and requests the company to alleviate the problem, for instance, by taking responsibility for the supply of fresh water to the affected villages. People can submit reports to the agency of observed accidents and harm to the environment. One incident was registered in 2011, but in 2010 there were no reports. This contrasts with the claims made by the consulted villagers that several complaints had been submitted. The staff explained that it had received no reports on the issues faced in Pondok Damar village (the one village that comes under its jurisdiction). Furthermore, they explained that the diversion or manipulation of rivers and streams is prohibited and that they have received no evidence of any such actions by the companies.

One officer of the **District Plantations Agency** commented that water pollution derives from a number of sources, including plantations and mills but equally mining and illegal fishing using chemicals. While plantations often use herbicides, this should be in compliance with

public legislation and, if certified, RSPO principles. The director of the agency noted that oil palms have widely distributed roots in the surface of the soil and thus do not collect much groundwater. There have been no cases of revoking concession permits because of non-compliance with environmental regulations. Some companies have lost their permits, however, for failing to undertake so-called productive activities on their allocated land within two years. In a unique case, a company lost its permit when its irrigation schemes caused serious damage to state infrastructure.

The Director of the **Provincial Environment Agency** in Palangkaraya noted that water pollution is a serious a problem throughout the province. This is linked to a number of causes, including chemicals from illegal mining, illegal logging, waste from palm oil mills, and hospital and household waste. The agency conducts annual voluntary testing of companies in the province to classify them on a scale of one to four, according to their environmental performance. So far, all the participating companies have either been ranked as requiring assistance or been placed under further surveillance.

At one of the **River Basin Authorities (BP DAS Kahayan)** in the province, the head of the Monitoring and Evaluation Office explained that major flash floods had been observed recently, which appeared to be caused by infrastructural blockage of streams and rivers, and increased run-off from oil palm plantations' drainage canals. The officer also observed concessions in swampy areas despite the fact that the Forestry Law (National Law 41/1999) prohibits plantations within 200m of such areas. There are also indications that stream ecosystems have been disturbed after a concession has been established, including fish deathand the disappearance of other aquatic animals. Reports have been submitted to the Ministry of Forestry concerning the concessions responsible, but no action has yet been taken by the companies. The River Basin Authority is an agency of the Ministry of Forestry in Jakarta and has no law enforcement authority, but it is mandated to focus on strategic planning for good management of water quality and water flows in the river basin. Despite observing such examples of flooding and deteriorating water quality, BP DAS does not have any systematic data to back up its observations. It only monitors smaller streams, while the larger rivers are under the authority of the infrastructure agency. Furthermore, it has only a limited budget and therefore can only monitor in selected catchments, each with its own monitoring station (the Tahay River, the Muntjan River, the Patenay River and the Katingan River).

The director general of the **Department of Agriculture** and the director of Post-Harvest and Business Development in Jakarta acknowledged that some NGOs have raised concerns about water resource management in connection with palm oil production, but claimed that no substantial evidence is available to support such arguments, and that no official reports had been received on water pollution or the depletion of groundwater or stream flows. The directors advised that a more important area for research would be GHG emissions from oil palm production, specifically to review the models applied by the EU. The Indonesian Palm Oil Commission, established under the Department, coordinates research on trade in CPO. The international policy debate means that priority is given to research on GHG emissions and water issues are not seen as relevant. The Director of the Indonesian Oil Palm Commission subsequently commented that Central Kalimantan is not representative of palm oil production elsewhere. The national government has made significant efforts to halt the expansion of plantations, for example, through the moratorium negotiated with Norway (see section 3.4).

Officers at the **Ministry of the Environment** explained that there are major issues with water management in oil palm plantations, especially when palms are planted on peatland. The drainage canals dry out the peatland and this increases the risk of forest fires, which in turn pose risks to the plantations. Palm oil mills are normally located outside peatland areas as they require solid land. POME is supposed to be captured in waste ponds and subsequently fed back to the plantations for use in fertilization; however, there are minerals under the peatlands and when the peat is oxidized, the erosion of toxic minerals leads to the pollution of the water courses – owing to a disturbance of the peatland itself. They also noted that the toxic substance is ferrous-oxide, which is highly acidic. Ferrous-oxide can remove nutrients from the water and its surroundings, in particular when canals are dug and the peatland is opened up.

4.2 Appraisal of the capacity of governance mechanisms

We provide our reflections on the nature and diversity of the stakeholder claims highlighted above in section 5. Before we do so, however, the remainder of this section appraises the capacity of key existing governance mechanisms to address the issues raised by stakeholders, and in particular to reconcile the competing claims.

Spatial planning procedures

The issuance of land permits is intended to be based on two parallel processes of land use planning. The decentralization policy sets out that the district (or province, for concessions spanning several districts) is expected to develop its territory in accordance with a district land use plan, which must be approved by the Provincial Government and, in turn, the National Land Agency. In parallel, the Ministry of Forestry, the Ministry of Agriculture and the Ministry of the Interior are responsible for the maintenance of national land-use maps demarcating protected forest land and land available for productive purposes.

Central Kalimantan province, however, lacks an approved spatial plan, and the most recent Forest Classification process, the *Tataguna Hutan Kesepaktan* (TGHK), which dates from the 1990s, has been rejected as invalid by the Ministry of Forestry, meaning that the only legal forest classification is the previous one from 1982 (Colchester et al. 2011). In effect, this means that there is a serious mismatch between the outdated land use map held by the Ministry of Forestry and the rejected land use map operated at the provincial level. A plantations agency officer explained that, in September 2000, a letter from the planning agency under the Ministry of Forestry, which referred to the recently passed Law 41:1999 on Forestry (article 19), agreed that the province could allocate forest land for plantations so long as the ministry had not designated the areas as non-forest land. The plantations agency viewed this as showing that the Ministry of Forestry recognized the fact that the discrepancy between spatial plans was holding back further development. Subsequently, however, in September 2006, the Ministry of Forestry issued a new letter cancelling the previous order, obliging the agency to revert back to enforcing the 1982 forestry map.

Today, the governor of Kalimantan province has frozen issuance of land permits, and the national moratorium has entered into force. In the period 2000–2006 many plantations were established in designated forest land. There is now no coherence between the land use plans at the different government levels. The plantations agency officer explained that: “the Ministry of Forestry map from 1982 states that only 9% of the province is recognized as non-forest area; perhaps even this house we sit in is registered as forest!”. Beyond this mismatch in planning documents, an officer from the Central Kalimantan Province Development Planning

Agency (*Bappeda*) explained that there is no standardized method for constructing maps in the Province, further complicating coordination between agencies.

Land permit procedures

According to Indonesian law, in order to initiate the production of palm oil, companies are required to obtain four permits to obtain concessions. The requirements and procedures for the issuance of permits are outlined in Ministry of Agriculture regulation 26:2007 (articles 3–15). The first three permits are issued by the District or *Bupati*: the *Ijin prinsip*, which recognizes the operation of the company; the *Ijin lokasi*, which identifies an area of operation for the company and where it may site nurseries; and the *Ijin usaha perkebunan*, which entitles the company to plant oil palms and commence production. On receipt of the required documentation, the national government, through the National Land Agency, may issue the final concession permit, the *Hak Guna Usaha* (HGU), which releases the land from forest classification. While the tax revenue accrued from natural resource production and sales (palm oil, rubber, fruit, etc.) must be returned to the national government, the sale of land permits for logging and palm oil concessions is handled at the district level (except for concessions spanning districts, where the province is responsible). The issuance of these permits provides an important source of income for the district government. Land permits issued from the sub-national governments can be revoked if there are severe violations of management regulations, if no HGU permit is granted by the National Land Agency or if the company has been unable to take productive action within two years. (For more information on the land permit regulations see e.g. McCarthy et al. 2012.)

The mismatch between land classification maps is a central reason why many companies operate concessions in the absence of an HGU. This means that companies proceed with operations mandated by district governments without being able to secure the release of their concessions from forest land classification. The lack of formal approval from the national government has in turn undermined implementation of legislation on plantations and environmental provisions. As a case in point, government officials explained that plasma allocation in line with the 2007 national regulation (Ministry of Agriculture Regulation 26:2007), which requires at least 20% of palm oil estate land to be allocated as plasma for smallholders, is held back by the absence of HGU certificates. If land appears to belong to the Ministry of Forestry, plasma cannot be allocated to local people. Furthermore, uncertainty over legal land rights discourages financial institutions from providing the necessary guarantees and loans to local people, who need financial aid with the process of registering their plasma land and initiating smallholder palm oil production. In the absence of land titles, it is not possible to obtain guarantees from banks. Environmental agency staff also commented that monitoring and enforcement of environmental and social obligations in the plantations are obstructed by the fact that the majority of concessions operate without HGUs and thus outside of formal legal recognition.

The absence of agreed spatial plans that cohere with the national forest map creates ambiguities which have been exploited by political interests. It was widely acknowledged, across the governmental, private and civil society sectors, that politicians at both the provincial and the district levels have been privately disposing of land permits as a source of patronage. Civil servants repeatedly commented that they could only provide technical assistance, and that the issuance of permits was the domain of the politicians, chiefly the *Bupati* and the sub-district leadership. Several officials expressed frustration with the fact that they were unable to carry out their duties in the vacuum created by these governance ambiguities. One officer commented: “I don’t agree with the management of the plantations

… but I'm just an officer with a boss ... I don't refuse plantations in principle, they are good for the development of the district, but now there are too many, and there is no balance between people, government and the private sector".

A number of important initiatives have been set in motion in the province to address the interlinked weaknesses in spatial planning and the issuance of land use permits highlighted above. The Governor has launched a Green Government Policy, which is a long-term strategic plan for the province to integrate development objectives with environmental sustainability and people's livelihoods. Official targets are to be set for land use, including a 67 % target for forest land, and a land zoning process has been launched to create up-to-date land use maps. In contrast with previous provincial planning efforts, this work has been recognized by the Ministry of Forestry and will thus aim to create coherence between national and provincial/district level views on current land use. Among others, the Director of the Provincial Environment Agency explained that it is expected that the land use permits issued by district and provincial governments in the period 2000–2006 will be officially recognized, and that companies will subsequently be able to obtain an HGU from the central government. However, in contrast to Ministry of Agriculture regulation 14:2009, peatland areas will be strictly protected. Furthermore, a new geospatial decree has been issued in the province with the aim of producing a common cadastral methodology across sectors for the registration of land and property. This should enable different agencies to maintain distinct maps but to overlay their information as needed to allow improved communication for protection and productive purposes.

General environmental regulations

Indonesian law contains a number of environmental provisions for the sustainable production of palm oil that have direct or indirect implications for water resource management. Most notably, the Forestry Law of 1999 (article 1) acknowledges that forested areas play an important role in the protection of water bodies and the regulation of river flows, including preventing flooding, erosion control, and maintaining soil fertility and water quality. This is particularly important considering the high level of seasonal variability of river flows and the periods of heavy rain. One key measure pertains to the prohibition on destroying naturally vegetated riparian zones around water bodies. This includes protection of 500 metres from the edge of a lake, 200 metres from the edge of larger rivers, and 100 metres from the banks of streams (see Forestry Law no. 41:1999, article 50).

However, most contributors acknowledged that enforcing such environmental provisions is a severe challenge. Among others, officers at the Ministry of the Environment commented that "Almost nobody complies with regulations to keep the required minimum distance from rivers and streams....the legislative framework is too complex and law enforcement too weak". Similar opinions were expressed by civil servants at the district and province levels, the companies consulted (growers as well as buyers) and NGOs. In the devolved governance system, the mandate for implementing ministerial regulations lies with the executives in the provinces (governors) and districts (*Bupatis*). The ministerial agencies are only responsible for supervision. Environment Offices and River Basin (BP DAS) officers stated that while Indonesia operates the Polluter Pays Principle, their agencies have no tools to penalize companies. The Environment Offices are responsible for ensuring good water quality, but only mandated to undertake monitoring and report to the central ministry – not to enforce the legislation in situations of non-compliance. To this end, sub-national enforcement activities are not budgeted for in the agencies' portfolio. As a case in point, the Director of the Provincial Environment Office explained that only a limited number of specially mandated

staff (Penyidik Pegawai Negeri Sipil, PPNS officers) have authority to penalize environmental offences.

Above and beyond the resource constraints and restrictions on the mandates of agencies, law enforcement is undermined by the fact that staff may be subject to conflicts of interest. District and provincial staff are employed by the government executives at each level and are ultimately expected to be attentive to the political will of the *Bupati* and the governor, respectively, including when political interests associated with attracting businesses conflict with national ministerial regulations. The Director General and his colleagues at the Department of Agriculture explained that this is a reflection of the decentralization in the country, and that *Bupatis*, as local politicians, might not prioritize implementing central government legislation.

The Provincial Governor recognizes the challenges associated with implementing environmental and forest regulations on oil palm plantations and has initiated a process of revising provincial regulation 3:2003 on sustainable plantation management to include prohibitions on plantations around water bodies in the sector's mandate. The revised regulation will also include recognition of customary rights and the need to allocate 20 % of land to smallholders as plasma, as well as improved conflict management mechanisms. In the redrafting, inspiration has been taken from the RSPO P&Cs, and it is expected that the new regulation will in effect be aligned with its requirements. However, the extent to which the revised regulation will support improved enforcement of the requirements remains unclear. A government official explained that the provincial plantations agency undertakes monitoring in all the 14 districts under its authority, and the revised regulation will only change the type of information gathered. In cases of non-compliance, the agency will still have to report to the *Bupati* (or the Governor if the concession is located between districts), with a recommended set of actions concerning the company in question.

4.2.4 Environmental Impact Assessment

In order to obtain the *Ijin usaha Perkubunan* from the District or Provincial government and the HGU from the national Land Agency, companies are legally required to complete an Environmental Impact Assessment (Amdal), which also includes a precautionary assessment of the potential impacts on water resources. The baseline for the Amdal is a feasibility study, which is expected to be undertaken before obtaining the *Ijin lokasi*. The feasibility study is a confidential document, which describes the planned concession, the villages located in the area, planned plasma allocations, infrastructural developments, likely HCVAs, and so on. These procedures are outlined in a number of legislative acts, including the National Regulation on Amdal (27:2007), the Ministry of the Environment Regulation on review of Amdal (24:2009), the Ministry of the Environment Regulation no.11/2008 concerning competence requirements when developing environmental impact assessments, and the Ministry of the Environment Regulation no.11/2006 concerning the types of business and/or action plans that require mandatory environmental impact assessments.

The provincial Environment Agency is responsible for reviewing Amdal applications by plantation companies in most of the districts under its authority. By 2011, only four district Environment Offices in the province had obtained the required licence to undertake reviews in their district. For districts without licensed offices (including the Kotawaringin Timur and Seruyan Districts), the provincial agency is responsible for the reviews and issuing permits based on input from consultants. This arrangement is expected to prevent cases in which district Environment Offices are caught up in conflicts of interest between the procedural

stipulations and the political desires of the district government. *One civil servant explained:* "there is a major problem with reviews at the district level, since the officer issuing the environmental permit is employed by the man – the Bupati – who is giving the land permit for plantations.…In many districts it is junior officers responsible, who do not have the decision-making capacity and are dependent on the will of the Bupati".

Government officials and NGOs stated that there are many examples in Central Kalimantan of companies obtaining the required Amdal documentation only after they had received an HGU, and that many concessions reach the harvest stage without an environmental permit, in particular the many concessions operating without HGUs owing to the challenges associated with land use mapping and planning. Several contributors described how Amdal procedures were undermined by the operation of what some labelled a "permit mafia". One senior EIA consultant explained:

> When a company asks the *Bupati* for the first level of permit, it submits a proposal and the *Bupati* dispatches a team to assess the area. The company pays the team for all services, its transport and accommodation . . . the team is not independent. The company negotiates with the team; how much land the company gets depends on the negotiation. Then the team sends a recommendation to the *Bupati* for his approval, including the payment for the permit. Typically, the area will decrease in acreage as the company goes through the steps in the permit process. There is a close relation between many companies and the *Bupati*. The number of permits approved increases during election time; the companies may also support a politician for election and be rewarded with permits afterwards.

In recognition of the fact that it is not possible to prevent companies from commencing operations without an Amdal, the National Government has legalized an alternative system of environmental screening under Ministry of the Environment regulation no.12:2007, concerning documents on environmental management and monitoring for businesses and/or activities that do not possess the required environmental management documentation. This regulation is only applicable to businesses in operation in 2005–2007 without a properly completed Amdal.

4.2.5 Free, prior and informed consent

The Plantation Law (Law no.18/2004) outlines provisions for negotiating compensation for the relinquishment of land rights in the process of obtaining land to launch a concession. The legal provisions of the province, in particular Provincial Regulation no. 5/2011 regarding Sustainable Plantation Business Management, mandates companies to carry out negotiations on compensation and payments directly with landowners. This provincial regulation also stipulates requirements for recognizing customary rights and institutions. In addition, provincial laws that specifically recognize customary rights to land were passed in 2009: a Governor's Regulation (PERGUB) supported by a Provincial assembly law (PERDA). A *Dayak* Customary Council is now registering land claims and preparing them for legal recognition (Colchester et al. 2011). It was widely acknowledged that transfers of land and resources must be based on the principle of free, prior and informed consent (FPIC) (e.g. rooted in the general requirements of the United Nations Declaration on the Rights of Indigenous Peoples, UNDRIP).

However, the principle of FPIC has not been incorporated into the Indonesian legal system. Recently, Central Kalimantan Province followed earlier steps made in Papua, Aceh and West Sumatra to instate local regulations adopting more detailed participatory procedures for land acquisition, but there is a need to further clarify whether this process meets the basic criteria

of FPIC, such as stipulated under RSPO principle 2 (on existing plantations), principle 6 (on agreed conflict and dispute resolution mechanisms) and principle 7 (regarding the giving or withholding of FPIC to new planting requirements). Moreover, government agencies are only involved in such land transfers if called in by the companies as third parties.

At the provincial level, there is a multi-agency conflict resolution group, which can receive complaints from citizens. According to the Director of the Provincial Environment Agency, it is indicative of the quality of these transfers that more than 300 complaints have been submitted in the past four years, but the multi-agency team has only been able to resolve two of these through mediation. The RSPO provides a non-judicial complaint mechanism (RSPO undated), and growers explained that they hold regular stakeholder consultations within their concessions to allow communities to express their grievances, if any. Local NGOs reported that complaints had been submitted directly to the plantation companies in question and to the certification auditors, but there has not been any reaction. The RSPO Liaison Office explained that, to date, no complaints had been received through the RSPO grievance mechanism from the field sites. In general, there have been no cases of certification being revoked from any company in Indonesia due to noncompliance.

Many of the representatives of communities and NGOs consulted criticized companies for relying on the use of force, including local militias, and ignoring the principle of FPIC. They also argued that government offices showed insufficient dedication to the registration of customary *adat* rights. A number of district and provincial government officials noted that it was common for the *Bupatis* to allocate community land for company plantations (see box 4.1). A sustainability manager for a buyer sourcing CPO from Central Kalimantan acknowledged that many plasma schemes do not work well in practice. However, he provided an alternative explanation for this. While NGOs tend to argue that it reflects the fact that people's land rights have not been recognized, the *Dayak* people, who were historically hunters and gatherers, still struggle to conform to the realities associated with settled lifestyles, and many leave their allocated plasma plots. When they return later, the land has been occupied by others or by the company.

Box 4.1 A personal account from a farmer in Sembuluh village

This is my ancestral land and it is my obligation to defend it. I moved to live here permanently in 2000, rather than in my house in the village, to prevent the company [Salonok Ladong Mas in the Sangpurna Group] from grabbing the land while I sleep. This land has belonged to our family for over 100 years; my ancestors planted durian trees on the land, which is the way to show ownership; you can see some durian over there by the road. I grow rubber, rear chickens and ducks, and let the cattle graze between the trees. Before the plantations came our family could plant paddy fields, vegetables and fruit trees. Now, this is impossible because the plantation company does not allow burning of land in the traditional way. The company has not provided plasma, only empty promises. If people do not release their land, then the company prevents people from getting work in the plantations. I have no government document to show that it is ancestral land, but it is recognized by ancestral law, and the borders have been negotiated with my neighbours. The company arrived with a permit from the national government, so they can use the land for 25 years. Many people are afraid of intimidation by the company and they give up their land and move away. The company officials say: "If you do not release your land we will take it anyway; but if you accept our offer to buy you out then you will at least get some compensation." I just came back from several months in prison, punished for picking palm oil fruits owned by the company; but they were on my own land. They target me as a leader of the opposition, since I have refused to hand over my land and encourage others to do the same.

(Interview, Sembuluh, 3 October 2011).

In all three villages, complaints were shared of how company staff had seized villagers' land against their will when negotiations had failed to release the land for the companies. In Pondok Damar, villagers explained that there were no consultations prior to infrastructure construction on the river. Villagers also explained that they had received no information about permits being issued to companies, and only discovered this after their agricultural land was occupied by concessions, or the rivers and streams started to suffer from pollution or infrastructural damage. The contributors from the three villages described what they perceived to be a number of strategies by companies to grab their land and water resources. For instance, while companies previously aimed to reach agreement on an acceptable level of compensation for the villagers in return for their land, they now tended to refer disagreements to the judicial system for the courts to settle disputes. This further disadvantages people since most of the affected villagers have neither the financial means to support a court case, nor the required legal documentation to prove their land rights. Trust in the judicial system to deliver a fair and independent judgement is also low. In the villages, some people had seized an opportunity to act as unauthorized middlemen to sell off land, leaving the locally acknowledged rightful owner powerless without acceptable legal documentation. It was suggested that in some of these cases, such persons were acting on behalf of and paid by the companies or the district or sub-district government.

Troubled by this unequal playing field, the affected villagers expressed frustration with the lack of support from local government. Local government officials, such as sub-district leaders, were seen as overtly partial for trying to convince villagers to consent to the plans presented by the companies, for example, when consulting on the Amdal. In Sembuluh village, people described how district government officials neglected their duties, and that even the *Bupati* had used threats to force people to end their resistance: "…when people protested against the new mill, the *Bupati* supported the company. In 2010, he came to our village for a religious event and said 'no one should oppose the mill or there will be trouble. If you work in government or plantations, then you will be fired"'. Interventions by district and sub-district government officials were also seen as a factor eroding the ability of the village headman and the village council to represent the interests of the village, including through indirect appointments of the headman by the *Bupati*. Furthermore, village council members were now being appointed by the headman, where previously they were elected by the villagers. The new headman was seen as serving the interests of the *Bupati* and the companies who had occupied the village lands. This situation was mirrored in Terawan village, where the villagers consulted explained that there had been a shift in the village leadership with the new headman supporting the *Bupati* and his political line.

Villagers and NGOs also criticized the lack of publicity given to EIA documents that allow for a mandatory three-month period for community claims and objections to be made. However, government staff in the district and provincial Environment Offices contradicted this view, stating that they provide copies of the documentation to villagers and NGOs. A consultant commented that when some NGOs have difficulty obtaining copies of Amdal documentation and other information, which should be freely available to the public under the Law on Right of Access to Information, this can also be related to communication problems; and that many NGOs do not have the capacity to apply their legal right to information or the know-how to use institutionalized channels to report district government errors to the governor or the provincial government.

4.2.6 Integrated river basin management

In 2004, a new Indonesian Water Law replaced the 30-year old Water Law no.11:1974. The 2004 law is a framework document, and its detail is elaborated in a series of regulations which were drafted in parallel with the bill. Among other things, it calls for the establishment of a National Water Council and River Basin Councils for all the country's river basins. Integrated watershed management is legally enshrined in this law, as well as in the Law on Spatial Planning and the Forestry Law. Decree 282 of the Ministry of Forestry further outlines the legal requirement to put in place transboundary basin management plans. In addition, national government regulation 8:2001 outlines goals for streams and rivers, which are monitored by the Environment Offices in the districts and provinces. It also requires five-year district plans for land rehabilitation and reforestation (Renlana Teknik Rehabilitasi Tatan and Lahan), which recognize the long-term strategic plans of the province, to be prepared and submitted for approval to the Social Forestry and River Basin Management Department under the Ministry of Forestry. As line agencies under the Ministry of Forestry, the respective river basin authorities, such as BP DAS, are responsible for supervising the preparation of these plans for each district.

However, government officials explained that the establishment of river basin and watershed management organizations, policies and plans had not commenced in the province. According to an official from Bappeda, this is particularly problematic because close to 70 % of the rivers in Central Kalimantan province drain from neighbouring provinces, mainly from rivers originating in West Kalimantan. Central Kalimantan is, as a downstream user, therefore exposed to pollution from activities upstream. The line agencies in the national ministries that facilitate integrated water management only have an advisory function, and all enforcement is the responsibility of the district and provincial governments. The Environment Office and the BP DAS Office responsible for monitoring water quality and flows acknowledged that, owing to limited funds, they had to focus on a few sample areas, and that data were extremely sparse for making informed conclusions about trends in the province – and even more so for an entire basin. The District Environment Office in Kotawaringin Timur has gathered a five-year time series of monitoring data, but only from 15 streams within the district and only pertaining to water quality. The officer in the BP DAS Office explained that "the total area [which we are] monitoring is 36 000 ha. There are plantations in two of these areas and we are worried about pollution from fertilizers and pesticides, but we do not monitor this". Furthermore, the government offices consulted did not appear to have inter-agency procedures for sharing monitoring information, preventing the compilation of data sets to produce an aggregate and more jointly owned picture.

On the water councils set up under the Water Law, senior staff from NGOs based in Jakarta stated that very few basin organizations in the country had managed to establish a systematic way of attracting income to finance their operating costs or provide incentives for the sustainable management of water. PDAM purchases drinking water, but the price is too low to serve as a real incentive to the river basin parties. The only real income opportunity is from hydropower. The state hydropower administration purchases energy based on set tariffs. Most basins feed agriculture and other water users but hydropower is often privileged as it represents the only real source of income. This becomes a problem for agriculture in the dry season, since hydropower needs a high reservoir level which keeps water from downstream users. NGOs perceive the National Water Council as hampered by the selective inclusion of non-governmental representatives, who are expected to support government positions. The formation of many river basin organizations has faced similar challenges, in that government officials disqualify other sectoral government representatives and/or NGO representatives on

the grounds of being "incompetent" or "unskilled", which in fact serves to protect their own interests. The Ministry of Public Works, which is the lead ministry on the water councils, is perceived as generally less transparent and more unpredictable in its operations than other ministries, which have recently been through a reform process.

Over and above the problems with river basin management, contributors from the government offices, research institutes and NGOs spoke of a need to consider the whole river basin in plantation management and planning, not only the administrative boundaries of the concession, district or province. Water table conservation and water resource management from a catchment perspective are voluntary. The only legal provisions, provided by Ministry of Agriculture regulation 14:2009, are on drainage management for concessions located in peatlands. This permits cultivation in peatland down to a depth of 3 metres and requires the use of "water gates" to maintain a minimum water table of 60–80 cm. It was explained that some organizations offer targeted support for growers to engage in collaborative landscape-level management by connecting HCVAs and drainage channels in order to preserve the water table at the catchment level. However, although good hydrological and spatial information is available in national registries, such actions are complicated by capacity gaps in companies, and there is a common discrepancy between the expressed priorities of Chief Executive Officers and the interests and capacities of staff on the ground. Policy development is in progress in the Ministry of the Environment, which is drafting a new government regulation on water system management that focuses on "hydrological peatland units". The preliminary proposal is that 30 % of each peatland unit should be protected in order to conserve the hydrological and ecological function of peatland.

4.2.7 Sustainability certification

The mill and its supply base comprise the unit of certification and audit for trade in RSPO-certified SPO. All relevant subsidiaries must also be certified. As is mentioned above, a number of the RSPO P&Cs focus specifically on water resources, and other criteria, such as principle 4 on appropriate best practices, which requires growers to preserve riparian zones/buffer zones, have indirect implications for water resources. Furthermore, RSPO HCVA management has a number of implications for water management, including protecting endangered ecosystems (HCV3), and ecosystem services such as flood prevention (HCV4). The RSPO also encourages companies to reuse and recycle waste water and to compost empty bunches of oil palm fruit, ultimately allowing for its substitution for inorganic fertilizer. The RSPO does not prohibit concessions in peatland areas, but it encourages careful planning according to soil type and provides guidance for existing plantations in peatland areas, for example, on how to maintain the water table. The RSPO has not yet been accredited under the EU-RED, as it lacks an accepted method for calculating GHG emissions from palm oil cultivation. Several contributors attributed this delay to the fact that the RSPO is a multi-stakeholder organization, and things move slower in such organizations than for those which are more centrally steered. In response to the requirements of the EU-RED, the RSPO has developed "RSPO+", which has specific criteria that comply with the EU Sustainability Criteria, for instance, prohibiting concessions in peatlands with more than 3m peat depth. In effect, this means that in the European market, most CPO from Kalimantan would only be available for use in food.

The Indonesian Palm Oil Commission explained that a new national regulation is being prepared to improve and guarantee the sustainability of Indonesian palm oil. A new national certification procedure, Indonesian Sustainable Palm Oil (ISPO), is also being launched (Regulation 18:2010). This will be compulsory for all producers and will gather together all

the requirements contained in other legislation that affect plantation companies. This will address the problem that one sector often does not know the requirements of other sectors, and place responsibility for monitoring on the productive sector. It is also expected that the implementation of the ISPO procedure will be more effective than current sectoral legislation. Certification will be handled by an independent certification body and there will be an arbitration committee with representatives from the public and private sectors and civil society. Furthermore, the ISPO procedure will be based on ISO standards for certification bodies and technical audits (see also Government of Indonesia 2012).

The fact that the ISPO procedure will be audited by independent certification bodies was seen by some private sector actors as government recognition of its weak enforcement of public regulation. Furthermore, there was significant frustration among many contributors about the general mismanagement of the value chain, through which Indonesia obtains lower prices than neighbouring Malaysia, partly because of the reputed obstacles to sustainable production. NGOs and government staff alike complained that many growers in Indonesian Borneo are subsidiaries of Malaysian companies, and transfer their palm oil within their own subsidiaries in order to sell it as Malaysian CPO, and also to avoid paying Indonesian export taxes. Staff in the Department of Agriculture and the Indonesian Oil Palm Commission explained that ISPO was also being pursued to counter what are seen as discriminatory GHG emission requirements imposed by the EU under the EU-RED. The Commission Director explained that it is intended to seek WTO approval for the ISPO standard to match other standards recognized by the EU. The Commission is also organizing research into GHG emissions to provide counter arguments to the EU's default values on palm oil.

However, a number of acknowledged challenges remain to be resolved. There were indications that some NGOs are critical of the ISPO initiative, believing that such certification should be developed by a multi-stakeholder body and not as a government initiative. Similarly, some companies currently certified under other standards, such as the RSPO, were concerned that they would have to invest in yet another certification process. In this regard it was suggested that it would be desirable if the ISPO could draw on existing certification systems to help minimize costs and avoid replicating past activity. Furthermore, the ISPO will require companies to establish management measures in relation to historical records on GHG emissions, but it seemed unclear how they will be able to obtain the necessary information.

A major issue highlighted by growers, buyers, government staff and NGOs was the limited premium associated with trading in SPO under the RSPO. The premium on RSPO-certified CPO fluctuates, and members perceive a problem with ensuring such a premium for growers. Some government officials believe that this reflects a wider problem – that the burdens are placed primarily on the producers rather than with manufacturers or the later steps in the supply chain (see Johnson et al. 2012). This leads to frustration among growers, since there is no financial incentive to cover the costs and the extra effort involved in living up to the RSPO P&Cs. There are high costs involved in certification, including auditing and the cost of reforming the chain of custody. One company noted that it costs around EUR 20,000 to audit a standard sized plantation, and each plantation must be audited once a year. However, one grower active in Central Kalimantan explained that, despite the lack of a financial premium, the RSPO guidance adds good value to management decision-making and is valuable for business marketing. Nonetheless, according to one buyer of CPO from Kalimantan, since at the moment the premium on certificated products is lower than the costs of certification, many companies are reconsidering their commitment to RSPO certification.

According to the RSPO liaison office, many growers do not see an urgent need to seek RSPO certification because they sell in the domestic market. When using mass balance or segregation principles, companies need to modify their chains of custody to ensure the required traceability. Conversion to producing sustainable palm oil thus takes time. Many buyers in the RSPO have pledged that they will work towards sourcing sustainable palm oil through a gradual conversion (a time-bound plan for SPO purchase). Until now, most multinationals have focused on their EU facilities and upgrading the chain of custody, and plan to focus later on other markets.

Many contributors suggested that given the problems of law enforcement, negotiated and voluntary agreements such as the RSPO's may be more effective than government regulation at promoting more sustainable production. However, as is mentioned above, the incoherence between RSPO requirements on HCVA management and government permit regulations (Ministry of Agriculture regulation 26:2007) means that that local government could retract land permits if companies are not being productive, such as in HCV areas. The RSPO was also criticized by some NGOs and consultants for its lack of clear indicators for assessing compliance with its P&Cs. Furthermore, as is noted above, while there have been no cases of revoking the certification of members, inhabitants in the three villages visited complained that several RSPO-certified growers do not comply with the P&Cs, including on HCV and riparian zone requirements, and the procedures for POME management. Problems of implementation may be related to a number of factors. One grower in Central Kalimantan explained that:

> It takes time for staff to recognize the function of the RSPO certification … It is difficult to implement the principles and criteria. There is a need to obtain buy-in inside the company to implementing the P&Cs. This requires capacity building among staff, through training and education, and senior management must also be committed.

One buyer explained that the company relies on other, EU-RED compliant, standards. However, although audit reports on growers' estates include some information on water resource management, there is no way to report this to the EU at present.

5. DISCUSSION

The South East Asian oil palm sector, in particular in Kalimantan, has seen heated debate over its sustainability and impact on local livelihoods and natural resources. Although it plays a pivotal role in the national economy and has demonstrated its ability to contribute to poverty alleviation and capital accumulation among its beneficiaries, the palm oil business has a well documented traumatic legacy. Its unceasing expansion has fuelled resource degradation, the marginalization of indigenous groups, and adverse impacts on the communities which have not benefited from the industry. These developments have taken place despite efforts to improve government regulation and periodic moratoriums from the central government. This schism has motivated much research, which has highlighted serious governance challenges as well as social and ecological impacts. Several growers have been blacklisted by the world's largest buyers of palm oil, Nestle Oil and Unilever, and in 2009 the World Bank ordered a complete moratorium on its investment in palm oil (McCarthy et al. 2012).

The central lessons that emerged from the synthesis of findings outlined above are summarized and discussed below in order to improve our understanding of the water resource impacts and risks, and the efficacy of the governance system.

5.1 Community grievances that require immediate attention

The synthesis of stakeholder views (section 4.1) highlights the range of complaints and grievances shared by villagers and those directly experiencing water resource impacts on their lives on or adjacent to the plantations. The main impacts are as follows, and are related to both water quality and water quantity:

1) Land clearing, erosion and run-off from plantations leading to turbid and murky water
2) Release of toxins into the water bodies through the spraying of pesticides on plantations
3) Decline in fish stocks and aquatic wild plants
4) POME and other palm oil waste either dumped or otherwise released into rivers and streams, including overflowing waste dams in the rainy season
5) Reduction or redirection of water flows linked to the construction of channels and dams for plantations
6) Floods linked to deforestation, which increases flows and the risk of flash floods in the rainy season
7) Drying of community land adjacent to plantations and a lowering of the water table (incl. wells), forcing villagers to give up traditional rice farming and work in oil palm production.

Beyond these immediate concerns with water resource degradation, local people can find themselves in a downward spiral of increased dependency on the plantation companies when water-dependent livelihoods such as rice and crop cultivation and fisheries are undermined by water scarcity and pollution, and when households depend on companies for their supply of drinking water. The provision of drinking water through government- or company-led compensation programmes appears ineffective and not to satisfy the basic needs of villagers. Nor do these forms of compensation appear to address the larger livelihoods impacts of water resource deterioration, such as the undermining of fishing or crop cultivation.

The above grievances highlight a low degree of community trust in the commitment of growers to wholeheartedly take account of the well-being of the local population. In fact, the evidence suggests that village communities are splitting into factions, with a new leadership having taken power that is more supportive of the District Government's political agenda. This highlights the risk that the palm oil industry will exacerbate local conflicts and tensions, undermining the social relationships and trust that are needed for collective action for sustainable water management. It also highlights the fact that some village constituencies might be more supportive of expanding the oil palm industry in their vicinity, and could find that the economic benefits outweigh the impacts on water resources that they are experiencing. In the field study sites, the villagers who are politically empowered are rewarded for their support of the district and/or sub-district governments and corporate agendas, while others find themselves suffering severely. This differentiation into "winners" and "losers" is powered by the internal factions linked to the pressures exerted by market forces, the oil palm industry and local government leaders.

Arguably, these findings raise larger questions about the trade-offs between the different benefits and costs arising from the palm oil industry. After periods of colonialism and of single-family oligarchy under Suharto's regime, Indonesia (supported by development cooperation and trade partners) is currently pursuing a neoliberal development pathway involving a mixture of decentralization and privatization of land and water management. Like elsewhere in the world, such a development model is being prioritized because it can deliver rapid economic growth – even at the expense of environmental health, and wider society and

water users may find that the detrimental impacts on their local surroundings are outweighed by the benefits delivered by wider economic exchange. However, the reconciliation of such impacts and benefits relies on the ability of the governance system to ensure a just negotiation between different water needs.

This requires that water resource management should be a socially sanctioned outcome of a legitimate governance process, not simply reified as an "unavoidable" consequence of economic development. As is further discussed below, the current governance system appears to be largely unable to support investigations into the uncertainties over water impacts in Central Kalimantan Province, or to mediate between the competing claims of stakeholders. The system is thus not capable of providing affected communities with fair opportunities to shape water resource management. These systemic weaknesses and outstanding complaints undermine the credibility of claims made by growers that may actually be investing heavily in the production of sustainable palm oil.[4]

5.2 The need for consolidated and trusted water resource data

The grievances of the three affected villages were confirmed by local NGOs, based on their experiences in many other locations in the province. These local organizations are supporting and representing complainants in their dealings with government and business representatives. Meanwhile, the consultations highlighted that some of the government agencies formally responsible for reacting to the villagers' complaints and claims either did not acknowledge that they had received these claims, or rejected their credibility due to the absence of official monitoring information.

During the consultations, a number of decision makers justified the lack of response to community complaints over water resources by pointing to the lack of credible information and consolidated data. There was clearly a limited and often diverging understanding of the water requirements for palm oil plantations and their impacts on rivers, lakes and groundwater aquifers. In particular, uncertainty existed regarding the relative role of different sources of pollution, and stakeholders disagreed over the exact causes of the pollution experienced by villagers in the field study locations. One of the key reasons for the lack of consolidated data appears, as in many other low-income contexts, to be a shortage of resources and capacities in the local administrative and government agencies mandated to monitor watersheds and basins.

The assessment has revealed a schism between the dependence of formal governance, in particular the public sector, on comprehensive quantitative monitoring data, on the one hand, and the inability of existing institutions to deliver such extensive and trusted information, on the other. This gap between expectations and reality undermines the ability to attribute responsibility for specific liabilities pertaining to the impacts on local water resources. In particular, it makes it difficult to identify the relative burden to be placed on the palm oil industry compared to other upstream users of water when observing the Polluter Pays Principle in environmental law. Pollution from heavy metals and other toxins related to smallholders' engagement in subsistence mining, and disposal of household and industry waste were recurrently mentioned as other possible causes of the skin rashes and fish deaths observed by the consulted villagers. Such impacts have been documented in Indonesia on previous occasions (Adijaya and Yamashita 2004, Djuangsih 1993).

[4] Many of these concerns were recently expressed in the Bali Declaration on Human Rights and Agribusiness in Southeast Asia, hosted by the Indonesian National Human Rights Commission (KOMNASHAM).

However, justifying the promotion of large-scale oil palm concessions in provinces such as Central Kalimantan on the grounds that no direct causal links have yet been scientifically proven reflects a rejection of the precautionary principle enshrined in international environmental treaties. There is evidence that management of the palm oil concessions in the field study sites exercises what is known as "post-damage control" for water resources, relying on compensatory but inadequate water supply reparations to the affected villages. A full endorsement of the precautionary principle would require a shift to "pre-damage control" through proactive prevention measures (UNESCO 2005).

Notwithstanding these uncertainties over cause and effect, the majority of stakeholders consulted appeared to converge on the view that the oil palm plantations were a significant contributor to the water resource problems experienced by villagers, among other things, through POME discharges, the general run-off from plantations (facilitated by drainage channels), and contamination from the application of fertilizer and pesticides. These risks have been noted elsewhere in other forms of biofuel feedstock cultivation (German et al. 2010, Koh and Ghazoul 2008). Furthermore, preliminary analysis of the data compiled by the Water Footprint Network has shown that of a group of major biofuel crops, palm oil has the smallest impact on water per energy content (Ennström 2012). The impacts highlighted in this report are thus particularly noteworthy and suggest the equal relevance of the present study to other biofuel feedstocks with a seemingly greater water footprint. It should also suggest that potential discrepancies between assumed and actual water management practices in plantations can result in serious deviations from generic water footprint figures.

5.3 Proposals for regulatory improvements

The appraisal of existing governance mechanisms (section 4.2) outlines a number of gaps in current regulations highlighted by contributors that need further attention. These include the absence of detailed guidelines for water flows and/or the use of drainage channels, or of the regulation of water drainage to maintain desirable water table levels at a catchment level in and around plantations. Similarly, some contributors asked for official guidelines on or procedures for landscape-level water management and plantation planning, which are particularly urgent where public sector river basin management has not yet been implemented (see section 4.2.6). There were few if any insights about whether existing policy measures, such as riparian zones, are really effective – even where implemented – for ensuring sustainable water management. Furthermore, there have been hardly any studies of the efficacy of the water management practices on plantations (Comte et al. 2012).

In this regard, it must be recognized that a number of promising legal changes are in the pipeline within the public sector. These include a new Government Regulation on hydrological peatland units, led by the Ministry of the Environment, and a revision of provincial regulation 3:2003 on sustainable plantations management by the provincial government. The findings highlighted a general need to improve the design of such formal governance structures.

While important legal provisions have been passed by the Provincial Governor to address the uncertainty over land rights, such as the recent provincial laws recognizing customary rights to land, little if any targeted action appears to have been taken with regard to water rights. One central judicial reason for the obstacles arising to the governance of water resources may be that the Indonesian legal system contains conspicuous ambiguities with regard to water rights. The constitution classifies water both as a human right and a natural resource to be controlled by the state, based on socialist principles from the early years of nation building. It

does not, however, set out clearly how to reconcile these two types of rights. The Water Resources Law of 2004 stipulates principles for "water use right" (*Hak Guna Air*), including establishing recognition of customary rights. Yet, in order to support valid claims the law requires affirmation of customary rights to be made by local government (Al'Afghani 2006). As is noted above, customary land rights are still only in the process of being mapped in Central Kalimantan. No specific references were made by the people interviewed for this study to calling for water rights, and it seems that there is considerable scope to clarify both the de jure and the de facto situation in terms of the allocation and control of water rights in the province.

5.4 Recognizing the hydrological function of peatlands

One particular hydrological issue that emerged was the risks arising from the release of toxic ferrous-oxide from degraded peatlands. Hydrological modelling using data from Central Kalimantan Province has previously shown that water draining from peatland concessions contains high levels of sulphuric acid and organic decomposed matter, adding low-pH compounds to the already acidic soils and water bodies (Wösten et al. 2008). Above and beyond the risks of toxification and acidification, it is well documented that the drying and removal of peatlands alters the local hydrological cycle, increasing the frequency of forest fires (Someshwar et al. 2009) and lowering water tables. Drainage channels in plantations also change the seasonality of stream and river flows as they accelerate water movement out of the peatland (Ludang et al. 2007).

While the intrinsic hydrological dynamics of peatlands and their role in carbon sequestration and biodiversity are well recognized, the ecological damage arising from the oxidation (aerobic decomposition) and release of peat toxins does not seem to be acknowledged in current debates or projects (e.g. compare with reviews in Beukering et al. 2002; Hooijer et al. 2006; CKPP Consortium 2008). Peatland conservation requirements under the EU-RED and the RSPO prohibit the cultivation of peatland with a depth of more than 3 metres. This is similar to the limit dictated by Ministry of Agriculture regulation 14:2009. While this may limit GHG emissions, it does not remove the risk of peat toxin releases from degraded peat soils. A similar gap in recognition appears to exist in methods of peatland valuation for ecosystem payments, such as REDD which is currently being launched in the province.

The function of peatlands in regulating water flows and sustaining desirable water quality in order to deliver water as an ecosystem service does not seem to have been considered. A wider appreciation of the water-related benefits arising from peatland and river basin management should be considered when pursuing further possible financing instruments such as REDD. Such efforts would also have to rigorously address the uncertainties associated with water rights in the province, including mechanisms to identify the real "service providers" in water-related ecosystem services (see Collins et al. 2011). It is possible that payments for ecosystem services linked to good water management could provide a much-needed additional incentive for local government to counterbalance incentives to dispose of land permits as a rapid but unsustainable source of revenue. This is important because local government does not receive a direct share of the tax revenues generated from resource exploitation in their territories, which is indicative of the sometimes tense relationship between local and central government in decentralized regimes such as Indonesia.

5.5 Perverse consequences of EU GHG emission politics

The limited appreciation of the direct water-related ecosystem services derived from peatland forests serves as a concrete reflection of the "water blindness" that characterizes the current

international debate on biofuel feedstock production. In tracing the narratives of water-related observations from the village level to Jakarta (section 4.1), it becomes apparent how local complaints about water resource impacts are "diluted" up through the network of actors to the national level. Concerns over the negative impacts on water resources lose their significance at higher levels of government vis-à-vis issues related to GHG emissions from the oil palm industry. This bias is understandable given the architecture of the EU-RED and its Sustainability Criteria which have an almost exclusively one-eyed focus on GHG emissions at the expense of other environmental and livelihoods-related concerns.

The presented findings suggest that extensive conversions of peatlands took place prior to the 2008 baseline set in the EU-RED (and are still taking place), and the Sustainability Criteria encompass only land use changes while disregarding water resource exploitation in the actual processes of cultivation and production (see section 2.1). Together, this demonstrates how the Sustainability Criteria are ill-suited to matching the socio-ecological reality and production history in a context such as Central Kalimantan. This imbalance is also evident in the dominance of the debate on ILUC in recent years (e.g. Laborde 2011). Comparatively little emphasis is placed on other "indirect" impacts, such as on water resources and the livelihoods of communities that depend on such resources.

The present case is thus indicative of how EU and international policy discourse on GHG emissions and climate change mitigation objectives drive the national allocation of resources in biofuel feedstock producing countries, which marginalizes other natural resource concerns and livelihoods issues. This finding supports a general criticism of current global politics: that it allows climate change mitigation and energy security priorities to put local livelihoods in peril and benefit already privileged market actors (e.g. Newell et al. 2009; Boyd and Goodman 2011). This also partly supports previous criticisms of the EU's renewable energy policies – that they seek to extend an "ideal type" governance model that does not adequately take account of the perspectives of trade partners and foreign actors, and ultimately produces undesirable impacts in producer countries (Di Lucia 2010). Indeed, the reliance on voluntary sustainability standards has proved problematic from a trade perspective, and could be considered a means for the European Commission and EU member states to "outsource" responsibilities for monitoring and enforcement. Exporting country governments, including Indonesia's, and industries have sued the European Commission, arguing that the current structure is protecting EU industries and blocking imports.

EU demand for biofuels is a politically constructed ("premium") market with particular tax subsidies and regulatory requirements. This merits special scrutiny of the effects of EU imports and the renewable energy policy framework. Given the current stand-off in the European Commission and the inability of its Directorates (primarily Energy, Climate Action and Agriculture) to cut across conflicts of interest, it is doubtful whether political advances can be made in Brussels in the foreseeable future. This inertia is further fuelled by the ongoing "euro-crisis", which has slowed decision-making in most of the political arenas of the EU. Future policy interventions must also take into account the fact that general market signals or price mechanisms can have equally or more important effects than those that originate from the EU-RED. This includes when palm oil is purchased for non-energy uses such as food or cosmetics. In fact, the majority of palm oil from Indonesia is sourced for use in food products, which are beyond any regulatory frameworks set by the governments of importing countries. Although the EU-RED requires the application of methane capture facilities to the treatment of POME, and that proper land permits (HGU) have been obtained, no such requirements are in place for the export of palm oil for food products. In this regard,

the lessons arising from this assessment of EU biofuel imports should equally be considered in relation to developments in the market for food products.

5.6 Failures of the regulatory regime

The findings combine to substantiate a general failure of existing public sector mechanisms to adequately respond to community grievances over water resources. This includes weak implementation of planned integrated basin and catchment management, general environmental provisions, land permits, spatial planning, and the procedures pertaining to environmental impact assessment (Amdal). It is argued that this situation is representative of "regulatory failure" and the low capacity for policy implementation in the Indonesian oil palm industry (McCarthy et al. 2012). In fact, one of the reasons for the current cost-competitiveness of the production of palm oil in the global market, and in turn its rapid expansion, is its low "costs of compliance" with environmental and social regulations and requirements. Observations of the lack of acceptable spatial planning and conflicting maps between government levels, as well as the trading of land permits by political executives, substantiate the existence of a political struggle between central and sub-national governments to secure benefits from forest and land resources (see also Casson and Obdinzki 2002; Edwards et al. 2011). As is highlighted above (section 4.2.2), the lack of an approved spatial plan and the uncertainties over land rights are seen by several contributors as key factors preventing the allocation of smallholder plantations (plasma).[5]

Notwithstanding the undoubted integrity, commitment and professionalism of many staff in local government authorities, it was generally accepted by private sector, government and civil society contributors to this study that the capacity of district and provincial government to enact formal governance structures in practice was severely limited. This was coupled with criticisms of nepotism and corruption in several agencies. Indonesia derives much of its economic growth from the expansion of agro-industries such as the oil palm sector. Politicians, from the President to Governors and *Bupatis*, are under much pressure from international lobby groups to maintain an investment climate that is deemed desirable by corporate executives. The financial revenues generated by these relationships often play a significant role in funding election campaigns and otherwise securing political support (Koh and Gazoul 2009; Edwards et al. 2011).

As is outlined above (section 4.2.1), the decentralization policy, with its extensive but insufficiently funded autonomy in the districts, has been one of the main drivers enabling the rapid conversion of forest land into plantations in provinces such as Central Kalimantan. Following decentralization, districts continue to depend on fiscal grants from the central government, which to a large degree frees district regimes from downwards accountability to its citizens (e.g. Casson 2000; Casson and Obidzinski 2002). Owing to the history of nation building in Indonesia, the state still has low levels of legitimacy in peripheral localities and formal public sector regulation is under-resourced. This means that "illegal" actions must be considered reflections of larger historical political struggles (Casson and Obidzinski 2002). It is also important to recall that local, district and provincial governance realities exhibit wide variations within Indonesia, and local government has often responded very differently to opportunities for collaboration with the private sector (e.g. McCarthy et al. 2012).

[5] As a corollary, in the World Bank measure of so-called "regulatory quality" Indonesia scores –0.30, ranking it third-highest of all the Asian countries (Phalan 2009). Despite the limited rigour of applying such general rankings to sub-national governance, this does suggest that the governance issues highlighted for Indonesia should be at least equally relevant for other Asian countries engaged in the oil palm industry, where the regulatory regime of the state is likely to be even weaker in the localities.

5.7 Strengthening stakeholder-negotiated sustainability standards

The general weaknesses of the public sector regulatory regime and the contestation and uncertainties associated with attributing responsibility for impacts on water resources mean that water resource governance decisions will – at best – be made based on negotiated outcomes between opposing views and interests. Hence, multi-stakeholder negotiated, voluntary and market-based trade standards, such as those offered by the RSPO, are a vital complement to public sector regulation. In communications with EU and Swedish actors for this assessment, it became clear that the RSPO is thought by some to provide one of the most advanced certification schemes with regard to water.

However, implementation of the RSPO P&Cs on plantations appears to be relatively weak. In fact, in the field sites visited, several of the companies or parts of their operations (mills or suppliers under holding arrangements) were RSPO certified. The companies that received direct complaints were PT Mustika Sembuluh of the Wilmar Group near Pondok Damar village, PT Agro Indomas of the Agrohope Group near Terawan village and PT. Salonok Ladang Mas of the Triputra Group near Sembuluh village. Both Mustika Sembuluh and Agro Indomas are RSPO certified. RSPO-certified concessions have initiated operations bound by partial certification requirements and have their respective time-bound plans.[6] These operations were the subject of serious criticism for non-compliance with both the RSPO guidelines and public sector regulations. This suggests that RSPO has difficulties enforcing its code of conduct. Previous studies have found that the grievance procedure requires improvement (Schouten and Glasbergen 2011). Weaknesses in implementing the standard and ensuring a robust recourse mechanism for affected communities could undermine the credibility of the RSPO.

A chief reason for weak implementation of the RSPO P&Cs may be the difficulty in ensuring the provision of economic incentives to counter the costs of compliance arising from certification and auditing (Johnson et al. 2012). It is commonly agreed that there are a number of benefits associated with membership of the RSPO, and these have an indirectly positive impact on the business viability of more sustainable plantation management, including a reduction in social conflicts and greater market access (e.g. Levin 2012). Furthermore, as one of the contributors to this study highlighted (section 4.1.2), sustainability certification and auditing may, in and of itself, serve as a valuable learning process and build much-needed capacity in companies,.

There was disagreement over the need to improve indicators to clarify the interpretation of the P&Cs during auditing (see RSPO 2006 on existing guidance on P&Cs). Some contributors suggested that the absence of indicators undermined the credibility and implementation of the P&Cs, while others believed that such indicators would prevent their application to diverse ecological and institutional conditions. This discussion appears to be reflective of the situation for many bioenergy sustainability standards (van Dam et al. 2008).

Taken together, these findings suggest that selective product certification cannot, at present, control the extensive changes in natural resource exploitation triggered by growing biomass consumption (Bringezu et al. 2012). Furthermore, concerns have been raised regarding the multiple sustainability standards now in operation or being launched, arguing that this leads to competition and confusion for both market actors and governments (van Dam et al. 2008).

[6] Certification of individual plantation units with time-bound implementation plans is permitted under RSPO certification if, among other things, there are no significant land conflicts or evidence of legal non-compliance (see RSPO 2012).

This, among other things, has prompted proposals to explore opportunities for bilateral and multilateral trade agreements under the EU-RED (e.g. Johnson et al. 2012). This could also provide an opportunity to link multi-stakeholder negotiated sustainability schemes with trade agreements, thereby providing mutual leverage (e.g. Prihandono 2011).

6. RECOMMENDATIONS

In conclusion, we offer a set of recommendations based on the findings discussed above. These recommendations represent the conclusions that we, the authors, have drawn from the work. Recalling our intention to use this study as a "learning platform" for further improvements in the existing governance regime, we warmly invite the reader to draw his or her own conclusions, and to engage in efforts to contribute to the improvements needed in the governance of water resources and the oil palm industry in Central Kalimantan Province. (Contact information for the collaborating organisations in this study can be found on p. 7.)

To actors in Central Kalimantan Province

1. *Immediately address the grievances of local communities* First and foremost, there is an urgent need to attend to the grievances of local communities in Central Kalimantan Province. The severe water resource issues raised by the affected villagers should receive immediate attention from government and private sector actors.
2. *Strengthen the capacity to enforce public legislation in the oil palm sector*. To achieve this, the government needs to provide greater funding to recruit and train district and provincial law enforcement officers and strengthen the accountability mechanisms (oversight) of government officials and corporate executives.
3. *Allocate a greater share of tax revenue from natural resource exploitation to provinces and districts*. It would incentivize sustainable development if the national government allocated provinces and districts a greater share of tax revenue from the production of crops such as rubber and fruit. District executives would then be less likely to opt to make a one-off profit by selling tracts of forest for clear-cutting in order to establish large scale oil palm production.
4. *Address the gaps in public regulations to enable landscape and river basin management* A number of gaps in current regulations require further attention. These include the limited legal guidance for the use of drainage channels, and regulation of water flows or water table management, including at catchment level. Some contributors also asked for official guidelines, or for required procedures, on landscape-level water management and plantation planning. This appears particularly urgent where public sector river basin management is not yet being implemented.
5. *Clarify the interpretation of constitutional "water rights"* There is considerable scope to clarify both the de jure and the de facto situation with regard to the allocation and control of water rights in the province, and how the right to water resources enshrined in the constitution and the Water Law should be interpreted.
6. *Establish and fund complementary conflict resolution mechanisms* Given the likelihood that local community grievances are not well addressed by existing governmental mechanisms, the establishment of alternative and sufficiently resourced conflict resolution mechanisms could be desirable as part of future developments in policy and projects. Targeted support for alternative complaints mechanisms and dispute resolution could form the core of further donor funded efforts in the province,

such as under the moratorium, the Letter of Intent between the Indonesian and Norwegian governments and the REDD pilot province programme.

7. *Direct strategic financing to water monitoring and building institutional capacity* Strengthened financial, human resources and institutional support are needed to build up more consolidated and better trusted water monitoring data that can support further improvements in water resource management. This should be a central task of national fiscal planning and of ongoing and future support from development agencies.
8. *Incorporate water-related ecosystem services into the implementation of REDD* Water-related ecosystem services appear to have been largely disregarded in the development of possible financing instruments, such as REDD which is now being implemented in Central Kalimantan Province. It is possible that payments for ecosystem services related to good water management could provide much-needed additional incentives to local government to counterbalance the incentives to sell land permits as a quick but unsustainable source of revenue.
9. *Apply participatory water assessment methodologies* Given the high degree of contestation among stakeholders, traditional scientific water monitoring is unlikely to gain the required level of consent and legitimacy from stakeholders across sectors. Participatory assessment and scenario methodologies may be more appropriate instead, in that they allow different actors to co-design the monitoring and assessment approach and collaborate in the interpretation of the results. Such participatory water assessment tools would also be well aligned with the efforts of voluntary and stakeholder-based market instruments such as the RSPO.
10. *Undertake independent studies of water management practice in plantations* Few if any independent studies have been conducted into the efficacy of water management practices on plantations. Such examinations are sorely needed to test the applicability of guidelines and recommendations.

To the EU and its member states

1. *Address the apparent conflict with the Policy Coherence for Development agenda in the EU-RED*. From the perspective of the European Union's ambition to ensure policy coherence for development in all its sectoral policies, the observations on severe water resource impacts ought to stimulate action in the European Parliament and the EU member states to ensure that EU policy developments, in particular the EU-RED, can address these risks in any further development of its renewable energy policy framework.
2. *Include criteria for integrated river basin water resource management in renewable energy policies*. The actions of the Indonesian national government and market actors (growers as well as buyers) are partly shaped by the trade regime and the Sustainability Criteria imposed by the EU. The current one-eyed emphasis on GHG emissions diverts attention from other political priorities, such as sustainable water resource management and local livelihoods. In this regard, a wider appreciation, for instance, in the EU-RED, of the water-related benefits derived from peatland and river basin management would be highly desirable.

3. *Strengthen traceability and transparency in the chain of custody*. Given the apparent variation in the commitment of localities and companies to implementing public legislation and private corporate social responsibility (CSR) commitments, the low degree of traceability required in the EU policy framework (through mass balance accounting) is highly questionable, and the desire to reduce these requirements even more so. Instead, it seems advisable to strengthen traceability and transparency in the chain of custody in order to reward local governments and companies that follow formal governance requirements and actively promote espoused sustainable water management strategies.
4. *Consider alternative fiscal regulations beyond the EU-RED*. Given the inability of the European Commission and the European Parliament to overcome conflicts of interest between different sectors and member states, it is doubtful whether political advances can be made in Brussels in the foreseeable future to improve the EU's renewable energy framework. Given the impacts that arise from general market conditions (pricing, tariffs, etc.) for the use of palm oil outside the EU biofuels market, it would seem worthwhile to consider alternative policy interventions into the financial regulations that drive investment in palm oil production, as well as other cash and energy crops.

To European market actors

1. *Embed sustainability standards, such as the RSPO's P&Cs, in the CSR policies and practices of European buyers*. RSPO certified SPO does not yet yield a direct financial premium, which reflects the lack of buy-in from buyers and retailers. Current supply-side inertia is partly a result of the limited demand-side response. This poses questions for European retailers and buyers about when they will proactively move to embed standards, such as the RSPO, in their CSR policies. (This applies to *all* trade in palm oil, including that used for energy, food and cosmetics.)
2. *Prioritize sustainability standards with a strong emphasis on water resources*. Sustainability standards, such as those included in the EU-RED, differ in the extent to which they address water resource management. The variations in the efficacy of these schemes may not always be well known by European companies or government agencies, and they should be advised to carefully scrutinize the rigour of such schemes when selecting and endorsing specific standards as part of national implementation programmes.
3. *Ensure that equal attention is paid to the chain of custody for palm oil for non-energy purposes*. Further interventions must also take account of the fact that general market signals and prices can have equal or even more important effects than the effects of tariffs and subsidies originating from the EU-RED. This includes when palm oil is obtained for non-energy purposes, such as food or cosmetics. The majority of palm oil from Indonesia is sourced for food products, for which governments in importing countries have not put regulatory frameworks in place. The lessons from this assessment of EU imports of biofuels should be considered equally in any future development of the general regulation of the market for food products and by European retailers and buyers.

To coordinators of voluntary market standards, such as the RSPO

1. *Strengthen accountability mechanisms and enforcement of grievance procedures, including more robust indicators for auditing*. From a broader value chain perspective, a number of interventions are conceivable and the existing RSPO requirements do not exhaust these opportunities. One notable issue raised was the lack of indicators for auditing the RSPO P&Cs. Examples exist in other contexts of the development of indicators that are adaptive to local contexts. This could be pursued by the RSPO in order to strengthen accountability and the credibility of membership.
2. *Assess the relevance of developing targeted criteria for water resource management in the RSPO P&Cs*. Water resource management requirements form part of the defined appropriate best practices and the HCVA management included in the RSPO P&Cs. However, none of the P&Cs specifically takes water management as its point of departure. Targeted indicators for water resources might be worth further attention within the RSPO.
3. *Work to align the forthcoming ISPO standards with the established RSPO standards*. Voluntary sustainability standards, such as the RSPO's, depend on the creation by governments of an enabling legal environment. It therefore seems advisable that adequate coordination and substantive alignment are ensured between existing standards, such as the RSPO's, and the new Indonesian government-led standard – the ISPO. This would enable the ISPO initiative to gain from, and leverage, the advances made by the RSPO, and improve the cost-effectiveness of such work.
4. *Strive to embed RSPO requirements in bilateral and multilateral trade agreements*. In order to obtain leverage from public sector regulation, the RSPO could benefit from exploring opportunities to embed its standards for SPO in bilateral and multilateral trade agreements under the EU-RED. (Bilateral and multilateral trade agreements are legal options that are expressly permitted and encouraged in the EU-RED.)

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ANNEX 1: COPY OF INTRODUCTION LETTER FOR STAKEHOLDER CONSULTATIONS

To whom it may concern

Letter of introduction for fieldwork in Central Kalimantan

Stockholm Environment Institute is an international and independent research institute head-quartered in Stockholm, Sweden, and undertaking research projects in the area of sustainable development. It is one of the globally leading think tanks in the area of environment and development, with six centres around the world and close to 150 scientists.

SEI is currently conducting an assessment of governance of sustainable water use in palm oil production, with a case study in Central Kalimantan. This work is funded by the Swedish International Development Cooperation Agency (Sida) and aims to deliver new insights to relevant government agencies, companies and NGOs involved with palm oil plantations. It is a pilot study, aiming to link up with and contribute to ongoing initiatives such as those coordinated by the Indonesian Government and the RSPO. The objective is to map out both positive and negative examples of water resource management associated with palm oil plantations and learn how risks of negative impacts on water resources are best managed.

The assessment is undertaken through consultations and interviews with professionals and water users to obtain an understanding of the views and interests of different stakeholders: government agencies, companies, NGOs, and communities and households. It is of utmost importance that the research team meets a broad range of stakeholders, who can inform about their knowledge so that the findings from the assessments adequately reflect the diversity in views and interests.

For the case study in Central Kalimantan, SEI has contracted Sawit Watch/WALHI Kalteng to act as its local counterpart and help set up meetings. This is because SEI acknowledges that Sawit Watch as a network based organization with good community contact can ensure that the assessment obtains a good insight into the local realities faced by communities. Under this agreement, Sawit Watch will also be responsible for liaising with government offices, companies and other NGOs to ensure that the research team receives their valuable inputs to the assessment. Beyond the case study, SEI will also be meeting stakeholders at national level.

All inputs will be included in a draft report, which will be circulated to the contributors for comments prior to publication.

I hope this work has your interest and that we may be able to meet you shortly. Please do not hesitate to contact me should you have further queries.

Yours sincerely,

ANNEX 2: THE PEOPLE AND ORGANIZATIONS CONSULTED IN INDONESIA

Organizational affiliation	Location and timing of consultation	People
Villages / citizens		
Villagers of Pondok Damar	Pondok Damar village, 3 October 2011	Former Head of village Village official Four farmers and one wife of a farmer
Villagers of Sembuluh	Sembuluh village, 3 October 2011	Former head of village Fisherman Four labourers in boat construction Two farmers
Villagers of Terawan	Terawan village, 4 October 2011	Two fishermen/farmers
Public sector		
District Plantations Agency	Sampit, Kotawaringin Timur District, 5 October 2011	Director Deputy Director Official
District Environment Agency	Sampit, Kotawaringin Timur District, 5 October 2011	Director Head of Monitoring and Evaluation Head of EIA office Head of Nature Conservation
Provincial Plantations Agency	Palangkaraya, 7 October 2011	Head of Investment Development Office
Provincial Environment Agency	Palangkaraya, 7 October 2011	Director
River Basin Authority PB DAS Kahayan (incl. with responsibility for Mentaya and Seruyan River Basins)	Palangkaraya, 6 October 2011	Head of Monitoring and Evaluation Office
Central Kalimantan Province Development Planning Agency	Palangkaraya, 8 October 2011	Official
Indonesian Oil Palm Commission, Department of Agriculture	Jakarta, 11 October 2011	Director Head of staff
Department of the Environment	Jakarta, 11 October 2011	Head of Office Official
Department of Agriculture	Jakarta, 11 October 2011	Director General of Estate Crops Director of Post Harvest and Business Development
Private sector		
Roundtable for Sustainable Palm Oil (RSPO) Liaison Office for Indonesia	Jakarta, 12 October 2011	Liaison officer
Buyer, world-leading company sourcing from Central Kalimantan	Tele-meetings, 22 September 2011 and 10 January 2012	Sustainability Manager Water researcher
Grower operating in Central Kalimantan	Tele-meeting, 10 January 2012	Head of Strategy and Planning, Environmental manager Director of Production
Private EIA consultancy	Palangkaraya, 9 October 2011	Senior consultant

Civil society		
Working Group for Community Forest Systems	Palangkaraya, 8 October 2011	Two project managers
Indigenous People's Alliance of the Archipelago (AMAN), Central Kalimantan	Palangkaraya, 8 October 2011	Programme manager
Office for Justice and Peace, Catholic Church Diocese of Palangka Raya	Palangkaraya, 8 October 2011	Director
Betang Borneo Foundation	Palangkaraya, 8 October 2011	Two project managers
Telapak	Bogor, 14 October 2011	Head of Programme, water resources
Research institutes		
Tropenbos Indonesia	Bogor, 24 October 2011	HCV and Forest Management Specialist Communications Officer
CKNet-INA (Collaborative Knowledge Network Indonesia)	Jakarta, 13 October 2011	Network coordinator and senior researcher
Engineering Faculty of the University of Palangka Raya	Palangkaraya, 8 October 2011	Staff member

ANNEX 3: SWEDISH AND EUROPEAN CONTRIBUTORS

People from the following organizations have been interviewed and/or otherwise provided guidance to focus the analysis in relation to the Swedish and European renewable energy/palm oil market and policy development. Their views have not been cited in the paper.

Department of Physical Geography, Stockholm University (www.su.se)

Environmental Impact Assessment Helpdesk of the Swedish International Development Cooperation Agency (http://www.slu.se/en/collaborative-centres-and-projects/swedish-eia-centre/)

European Commission, Directorate-General for Climate Action (http://ec.europa.eu/dgs/clima/mission/index_en.htm)

European Commission, Directorate-General for Energy (http://ec.europa.eu/energy/index_en.htm)

ICA AB (http://www.ica.se/eng-sektion)

Fortum AB (http://www.fortum.com/en/pages/default.aspx)

Preem AB (http://www.preem.se/templates/page____15.aspx)

Roundtable for Sustainable Biofuels (http://rsb.epfl.ch/)

Swedish Association for Nature Conservation (http://www.naturskyddsforeningen.se/in-english/)

Swedish Standards Institute (SIS) (http://www.sis.se/en/)

Swedish Energy Agency (http://energimyndigheten.se/en/)

Swedish Water House (http://www.swedishwaterhouse.se/en/)

SwedWatch, Sweden (http://www.swedwatch.org/en)

Unilever (http://www.unilever.org/)

Wageningen University, the Netherlands (www.wur.nl).

World Wide Fund for Nature, Sweden (http://www.wwf.se/header/english/1129071-about-wwf)

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The Stockholm Environment Institute

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