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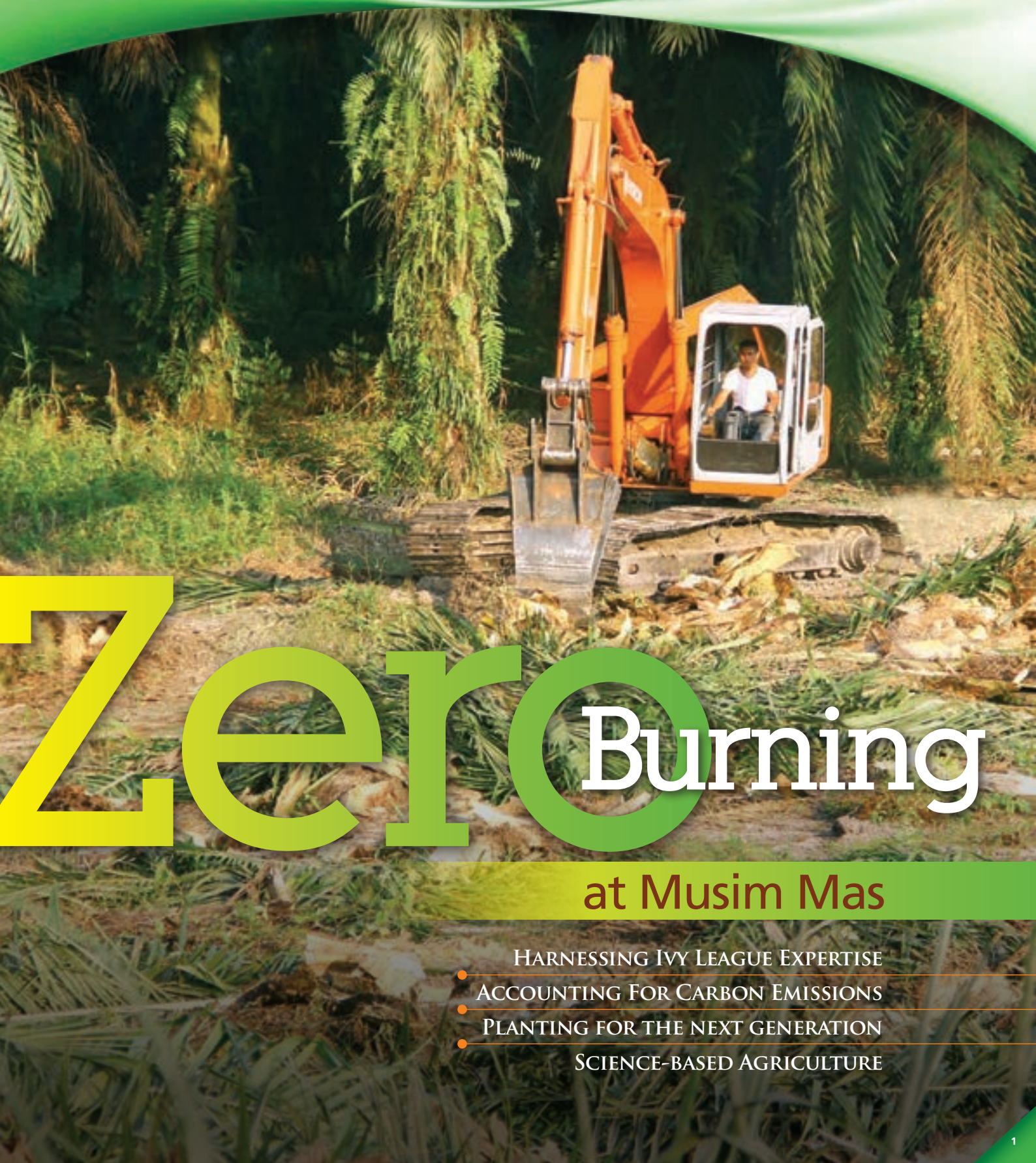

Zero Burning

at Musim Mas

- Harnessing Ivy League Expertise
- Accounting For Carbon Emissions
- Planting for the Next Generation
- Science-based Agriculture

Foreword

The recent air pollution in Southeast Asia has inconvenienced many in major cities. While it is easy to attribute the source of haze to forest and peatland fires, it is difficult to identify the cause of these fires. As a policy, Musim Mas is committed to zero burning for all its plantations ("*Zero burning at Musim Mas*").

No man is an island. This issue is also about how others have helped in our sustainability endeavour: the folks from Princeton University assisted us with the birds in our plantations ("*Seeking Ivy League intervention*"), the authorities provided guidance on the native trees to be planted in our riparian areas ("*Planting for the next generation*"), and even the flowers helped us in getting rid of the pests ("Flower Power").

On another note, the revised Roundtable on Sustainable Palm Oil Principles and Criteria document (RSPO P&C) now requires companies to start counting the carbon dioxide emissions ("*Accounting for carbon emissions*"), not just the profits, ushering an era of carbon accounting which will lead to public reporting in the years to come. As a progressive sustainable palm oil player, Musim Mas is well prepared to welcome this new development.

I hope you enjoy reading this issue.

Bachtiar Karim

Executive Chairman
Musim Mas Group

Z

Only mechanical method applies

At Musim Mas, sustainable agriculture starts with choosing an appropriate land type and adopting the right method of land clearing.

Haze has almost become an annual affair in the last decade: during the dry season of June-July, Singapore and Malaysia would be engulfed in a thick layer of haze. As the country of origin, the cities in Indonesia are not spared either. This year the problem has reached another dimension, with the Pollutant Standards Index (PSI) scaling new heights of 400 - 800 in different regions.

While it is easy to attribute the source of haze to forest and peatland fires, it is difficult to identify the cause of these fires. Large oil palm plantations are often seen as being

eco Burning

Primary forest with high conservation values remained intact after mechanical clearing.

responsible for the fires. However other contributors may be held responsible too. Small farmers who cannot afford mechanical means of land clearing may resort to slash-and-burn to plant oil palm or other subsistence crops, or small and medium-sized oil palm plantations may take a quick and easy way of clearing land by burning. To make things worse, it is legal for small farmers (less than 2 hectares of land) to clear the land by burning.

In contrast to the 1970s, forests today are easily accessible through logging roads. As population expands, more people depend on forests for livelihoods, including migrants, shifting cultivators, land clearing contractors etc. This will also mean that more people may resort to slash-and-burn method to carry out their activities.

Slash-and-burn method involves chopping down trees, piling up dead wood and leaves, and razing the heap. When conducted on highly flammable peatland, the fires can spread great distances underground, making these fires difficult to extinguish.

Mother Nature is not helping much either. To explain why the fire risk is higher now as compared

to the past, Professor Thomas Menkhoff from Singapore Management University said, "Experts have observed a significant change in vegetation from drought-resistant natural forests to drought-sensitive secondary forests, resulting in the increasing accumulation of dry material to become fuel for combustion."

The data published by the World Resources Institute (WRI) indicated that 52% of the fire alerts occurred within the timber and oil palm concessions, while the remaining 48% was seen on land controlled and managed by others, including local communities. However, WRI also cautioned that satellite data can only show the possible locations of the fires, but not indicate how they start or spread[2]. This is because boundaries may have changed as companies switched hands. Even in the companies' concession areas, it is common for local communities and smallholders to occupy parts of the area.

As the international non-governmental organisation (NGO), WWF has highlighted in its recent press release, "Concession holders have legal responsibilities over concessions but it does not necessarily follow that the companies are responsible for lighting the fires."[3]

At Musim Mas, sustainable agriculture starts with choosing an appropriate land type and adopting the right method of land clearing. The Group has long adopted zero burning policy in developing new plantation or replanting of aged plantation. Musim Mas relies on mechanical means to stack the debris or existing biomass in windrow. The biomass is then left to decompose, providing nutrients to nurture the soil. Even though mechanical means of land clearing may be more expensive but it is environmentally sustainable.

The Group maintains teams of well-trained fire fighters across its plantations. Its fire brigades are deployed to put out fire within the plantation and often called by the local authorities to help combat fires outside its boundaries. Ongoing education for local communities will ensure local people living in and around the plantations do not contribute to blazes.

Musim Mas believes that the haze problem can only be solved if there is a concerted effort by the public and private sectors to address this issue. This is why Musim Mas has actively participated in multi-stakeholder forums such as the Roundtable on Sustainable Palm Oil (RSPO).

1 Menkhoff, Thomas, 2013, "We didn't start the fire! – who did?", The Business Times, 27 June 2013, p21.
2 World Resources Institute website, Peering Through the Haze: What Data Can Tell Us About the Fires in Indonesia, the World Resource Institute, last assessed on 28 June 2013. < http://insights.wri.org/news/2013/06/peering-through-haze-what-data-can-tell-us-about-fires-indonesia#sthash.QJjGduFa.dpuf >
3 WWF website, WWF calls for zero-burn laws as hot spot analysis fingers pulp and palm oil industries, WWF Global, last assessed on 28 June 2013.

Fire drills are conducted frequently to train fire-fighters across the Group's plantations.

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Harnessing Ivy League Expertise

Giam, a Ph.D student, together with Dr Harris, conducted a bird monitoring workshop for Musim Mas.

Monitoring the birds in plantations

Dr Harris from Princeton University conducted a bird monitoring workshop for the team of High Conservation Value (HCV) Management and Sustainability Assistants in April 2013. The team members, chosen from different plantations, stretched their ears to listen to a curious mix of birds' chirp, growl and high-pitched pant depending on how each deciphered the sound. They made notes in a revised monitoring template based on the input from Dr Harris.

Part of the periodic peer reviews, Dr Harris and Xingli Giam from the Ivy League university in the United States, were in Sorek plantations for a three-day workshop. The peer review aims to improve the current method of monitoring and evaluating the birds in the HCV areas for better data management.

Dr Harris and Giam suggested the use of sound recorders to ensure accurate identification of bird species. They also recommended a larger number of habitat types to be included in the monitoring programme and co-operation with local bird experts to improve the accuracy of data monitoring.

Since 2011, Giam, a Ph.D. student, has been working closely with Musim Mas. The Group provides sample sites for part of his thesis research on fishes in riparian areas.

"There is a lack of literature on the conservation of aquatic biodiversity in the oil palm landscape, specifically on the value of conserving natural riparian areas in the tropics. Most of the prevailing literature centres on pastures and timber concessions in temperate countries, so studies on riparian areas in tropical oil palm plantations are urgently needed. I hope my research work can help close part of the knowledge gap," said Giam, who is in his fifth and final year of postgraduate study.

Dr Gan Lian Tiong, the Group Head of Sustainability said, "As an organisation of agronomists, planters, merchandisers, engineers and accountants, this partnership brings a much welcomed professional ecological expertise."

The collaboration of Musim Mas with the Princeton academia is one of the examples of valuable partnerships with stakeholders, where both parties obtain mutually beneficial results.

“You can’t see them all but you can hear them, if you keep really quiet,”

whispered Dr Bert Harris as he recorded the medley of chirp with his huge microphone and sound recorder.

Accounting for Carbon Emissions

What the new RSPO P&C means for Musim Mas

The Roundtable on Sustainable Palm Oil (RSPO) launched its revised Principles and Criteria (P&C) document in April 2013, which included new guidelines for managing and mitigating greenhouse gas (GHG) emissions. One of the new revisions states that growers should implement a monitoring system based on the PalmGHG calculator endorsed by RSPO.

This represents the start of internal carbon accounting when producing sustainable palm oil. Musim Mas has gained experience from the GHG reporting requirements of the International Sustainability and Carbon Certification (ISCC), thus it is well prepared for the eventual public reporting. The Group was the first in the industry to operate an ISCC-certified palm biodiesel plant integrated with certified mills.

The information on the GHG footprint of the Group's processing operations is supplemented by an external Life Cycle Assessment (LCA) on palm biodiesel – an analytical tool to assess the environmental impact relating to the whole production chain of palm oil. A 2011 study on palm biodiesel by the Malaysian Palm Oil Board gave a rough estimate of the GHG contribution by different stages of the palm oil processing chain (nursery to the palm biodiesel plant), providing a valuable reference to review the Group's operations for "hot spots" and identify areas to reduce emissions.

For example, the Group now avoids new plantings on high carbon stock land such as primary forests, high conservation value forests and peat lands.

The study also highlighted that during the processing of fresh fruit bunches to palm oil, the methane gas emitted from palm oil mill effluent is the single largest source of GHG emissions (from plantation to mill gate) – some 55% of the mill's total emission. Strapping this gas can reduce emission to 15% of the total emission.

Therefore Musim Mas has focused on installing methane capture facilities for all its mills to reduce the overall emission of its palm biodiesel. With the new facilities, the palm biodiesel produced by Musim Mas has a carbon dioxide emission rate which is 60-70% less than fossil fuels. This is more than European Union's Renewable Energy Directive's (EU RED) current requirement of 35%.

In recent years, the governments in the OECD countries have been setting targets for emissions reduction, which become progressively stringent. For example, the EU RED will increase the minimum GHG savings from the current 35% to 50% in 2017 and then to 60% in 2018 for new facilities.

This accounting step will track the Group's environmental performance, and allow Musim Mas to do its part as a progressive sustainable palm oil player.

This facility captures the methane gas generated by the mill effluent in the pond. The pond is tightly sealed with a High Density Polyethylene (HDPE) material to capture the methane gas.

PLANTING FOR THE NEXT GENERATION

Musim Mas works with the Indonesian Ministry of Forestry

A Chinese proverb that goes "one generation plants the trees, another gets the shade" (前人种树，后人遮荫) best describes the current riparian restoration work at Musim Mas, both literally and figuratively. These trees are planted now so that the natural environment can enjoy the ecological benefits in the future.

Musim Mas' President Director, Mr Bachtiar Karim, planted the first tree in the riparian area in one of the Group's plantations located in the Riau Province of Sumatra on 21 November 2008. This initiated the start of the riparian restoration and a long-term collaboration with the Indonesian Ministry of Forestry.

"Riparian" from the Latin term riparius, literally means "water's edge," describes a strip of natural vegetation that separates a water body such as river from land. A riparian zone in a plantation serves an important ecological functions by binding the soil to prevent erosion or acting as a wildlife corridor for species. In addition, the vegetation also provides shade that lowers the temperature, and allow the aquatic biodiversity to thrive in the hot tropical climate.

As part of the RSPO and Indonesian legal guidelines, companies are required to maintain the quality and availability of surface as well as ground water by protecting the watercourses in riparian areas. The buffer area needs to be set at least 50-100 metres away from the river bank, depending on the size of the watercourse.

While RSPO guidelines state the principle behind maintaining natural water quality, however they do not specify on the practical implementation of "forest restoration." How does one "restore" a forest? What kind of trees should be planted? Since the Group did not have the internal expertise, Musim Mas believes that tasks such as forest restoration are best left to the experts.

In March 2009, Musim Mas signed a Memorandum of Understanding (MoU) with the ministry to seek the authorities' help in advising the type of trees needed in the area. The Group has since planted Mahogany, Shorea, Blackboard and Tembusu trees, all of which are native to tropical rainforests.

Since Mr Karim planted the first tree four years ago, the riparian restoration project has become an important feature of the plantation, protecting the quality of the water course.

Dense vegetation along the river stream in one of Musim Mas' plantations.

Science

THREE

things you need to know about the Musim Mas Analytical and Quality Control (QC) Laboratory

Contemporary oil palm agricultural practices are about applying research knowledge back into the fields. This includes having a fully equipped laboratory that supports the field practices.

Based in Medan, the laboratory receives testing samples from plantations all over Indonesia and is ISO/IEC 17025 accredited for quality management.

1 How does the laboratory help with the field work?

The laboratory provides scientific analysis to support the operational goals of the plantations and mills in Musim Mas Group.

It provides timely, accurate and reliable analysis on fertiliser quality, plant tissue, soil nutrients or contaminants, oil palm products and the quality of the wastewater.

The analysis in turn acts as a useful tool for the operations to accurately diagnose the root of some operational issues.

For example, fertilisers that are purchased from suppliers are often tested to determine the nutrient content or for signs of contaminants. As fertilisers are the major component of the plantations' operating costs, a check on the quality will reduce the incidence of fraud whereby the plantation receives materials of lesser quality.

-based Agriculture

2 What is ISO/IEC 17025 accreditation?

On 23 November 2012, Musim Mas Analytical and QC Laboratory achieved the ISO/IEC 17025 standards for accreditation.

ISO/IEC 17025 are the international standards issued by International Organisation for Standardisation (ISO). It contains general requirements for the competence of organisations performing testing and calibration, including sampling.

Laboratories all over the world use the standard to develop management system for quality, administrative and technical operations, which in turn help to ensure accurate and reliable testing results.

3 What is the other achievement?

Since October 2010, the laboratory has been participating in the International Plant Analytical Exchange - Wageningen crosscheck programme.

Part of the renowned Wageningen University (life sciences) in the Netherlands, the programme started in 1956 and currently has about 209 participants from 60 countries, including Musim Mas. The participating laboratories receive dried plant samples every three months to be analysed according to their own procedures. The results of the analysis are then collected and processed by the Wageningen University.

Musim Mas Analytical and QC Laboratory has consistently been ranked the top among similar facilities in Indonesia and Malaysia in terms of accuracy of the analysis results.

MUSIM MAS

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Musim Mas is a fully integrated palm oil corporation with operations spanning the entire palm oil value chain from upstream oil palm plantations to midstream and downstream operations such as kernel crushing, refining and manufacturing of specialty fats, biodiesel, oleochemicals including fatty acids, fatty alcohols and glycerine, soap, palm wax and fine chemicals. Its supply chain is managed through strategically located bulking installations and transportation assets to provide efficient logistics solutions. Musim Mas, a pioneer member of the Roundtable on Sustainable Palm Oil (RSPO), is committed to doing business in a socially responsible and environmentally friendly manner.

This newsletter is published by the Musim Mas Group. Comments and suggestions are welcome. Please contact the Sustainability team at sustainability@musimmas.com or visit our website at: **www.musimmas.com**

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