

THE ALLIANCE FOR RESPONSIBLE FOREST MANAGEMENT

Supporting and training best management practices in
tropical forest management

BUSINESS PLAN

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Acronyms

Table A-0: List of acronyms used in this document.

Acronym	Meaning
APKINDO	Indonesian Wood Panel Association
ARFM	Alliance for Responsible Forest Management
BMP	Best management practices
CB	Certification Body
COVID-19	Corona virus
CFL	Climate Forestry Limited
CIFOR	Center for International Forestry Research
CSA	Canadian Standards Association for Forest Certification
FAO	Food and Agriculture Organisation of the United Nations
FFT	Fundacao Floresta Tropical
FLR	Forest Landscape Restoration
FSC	Forest Stewardship Council
GIS	Geographic Information System
GHG	Greenhouse Gas
HCSA	High Carbon Stock Approach
HCVN	High Conservation Value Network
IMAZON	Instituto do Homem e Meio Ambiente da Amazônia
IUCN	International Union for the Conservation of Nature
NGO	Non-Governmental Organisation
ITTO	International Tropical Timber Organisation
PEFC	Programme for the Endorsement of Forest Certification
RIL	Reduced-Impact Logging
STA	Sarawak Timber Association
TFF	Tropical Forest Foundation
TOR	Terms of Reference
TNC	The Nature Conservancy
TWG	Technical Working Group
UNCBD	United Nations Convention on Biological Diversity
UNCCD	United Nations Convention to Combat Desertification
UNCED	United Nations Conference on Environment and Development



UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
WCS	Wildlife Conservation Society
WWF	World Wide Fund for Nature

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Executive summary

- The Alliance for Responsible Forest Management (ARFM) is a new international not-for-profit non-governmental organisation to accelerate the implementation of responsible forest management across the tropical world. Through coordinated global network of training centres, ARFM will promote and train practitioners on best management practices in responsible forestry and contribute to reducing greenhouse gas emissions from entering the atmosphere from the forest sector.
- The ARFM concentrates on commercial tropical forestry applications in natural forest, planted forest, conservation forest and rehabilitation of degraded forest.
- Global forests are critical to the earth's environmental health - The Earth's forests host a large portion of natural ecosystems, containing a vast diversity of habitats with unique compositions of increasingly threatened flora and fauna. In addition, their carbon absorption and storage functions contribute to global climate stabilisation.
- Deforestation will continue if action is not taken - Despite all efforts in forest conservation global losses in forest cover have occurred at the rate of about 5.2 million hectares (ha) per annum over the 2000-2010 period. The rate of forest loss over the last three decades since 1990 has accumulated to an incredible 178 million ha or 5.9 million ha per annum. Though there is a gradual trend to reduced deforestation during the last decade these figures are nevertheless of great concern for the fight against forest loss and global warming.
- The number of countries in support of forestry protection is growing - International conventions, agreements and resulting national forest policies of most nations recognise and support the need for forest conservation and responsible management for environmental conservation, community livelihood and sustainability.
- Certification organisations and processes can ensure forests are protected without eliminating the demand for timber products - Since the establishment of forest certification organisations such as the Forest Stewardship Council (1994) and the Programme for the Endorsement of Forest Certification (PEFC) (1999), a total of 533 million hectares of commercial and non-commercial forests have been certified to ensure their long-term survival and viability. This represents only 13% of the estimated 4 billion hectares of the world's forests.
- In the tropics, a total of 30 million ha has been certified, representing 15% of the 200 million ha of forests globally designated for commercial production. This leaves a balance of 170 million ha or 85% of commercial tropical forests that are managed without employing certification standards and frequently applying harvesting rates beyond sustainable levels. The condition of forests managed under conventional practices leaves much to be desired, often characterised by lack of understanding or respect for the natural environment, poor planning skills and high forest and environmental impacts from construction of roads, camps, from heavy forest machinery, uncontrolled felling, skidding and storage of timber.

- Ensuring tropical forests are used for multiple long-term environmental, social and economic benefits requires an increase of forest areas under responsible management and independent certification. While certification Principles and Criteria advocate environmentally sound management practices including Reduced Impact Logging (RIL), they do not reference clear protocols on how this should be implemented, nor measurable indicators to assess compliance.
- The reasons for vast tropical forest areas being managed under conventional logging practices include lack of awareness and understanding by stakeholders for the need of ARFM, limited efforts to communicate the environmental, social and economic benefits of ARFM, lack of technical knowledge of systems and procedures, as well as inappropriate forest technology. Poor monitoring and enforcement by regulatory authorities add to the problem.
- The ARFM is aimed to accelerate the implementation of responsible and sustainable forestry across the tropical world and create a coordinated global network of training centres to promote and train practitioners on best management practices. The ARFM shall direct over 30 years of peer-reviewed research and applied knowledge to create regionally appropriate best practice manuals, complemented by training centres to train practitioners, Certification Bodies (CBs), auditors, as well as government agencies and private sector forest organisations. Training will consist of both classroom-based (virtual and/or in-person) and on-site education programmes in regional training centres planned for Africa, Latin America, and Asia-Pacific.
- ARFM will adopt a Member and Supporter business model to complement income from training modules. During the first year, a minimum amount of USD 450,000 is needed to support registration of the Organisation and the creation of the best-practice manuals, including international stakeholder consultation. ARFM aims to have a net positive cash-flow by year five, with continued support and an increase in the number of Members and Supporters globally over time, with all dividends reinvested into the organisation annually.
- In conclusion, all reasonable efforts should be undertaken to raise awareness and seek the active support of all stakeholders, and to develop the necessary capacity for the implementation of ARFM through a comprehensive human resource development programme. This programme shall deliver a significant contribution to remove the current barriers of practicing responsible forest management.

– End of Executive Summary –

Problem and solution

The demand for timber and forest area is increasing over time: Responsible practices are needed to ensure economic, environmental and social sustainability.

The mechanisation of timber harvest practices in the 1950s resulted in significant increases in logging activities. Globally and across all forest types, 403 million hectares (ha) of forests are intended for commercial activities. Between the period of 2000-2010, global production forests decreased at the rate of $\sim 5.2 \text{ mil ha}^{-1} \text{ yr}^{-1}$, while global demand for forest and timber products increased, highlighting the need to improve forest management practices (FAO 2014, ITTO 2011).

According to the Global Forest Resources Assessment 2020 (FRA 2020) of the United Nations Food and Agriculture Organization (FAO), the rate of forest loss in the period 2010-2015 amounted to 12 million ha, whereas in the following period 2015-2020 it declined to an estimated 10 million ha. Since the year 1990, a total of 178 million ha or $5.9 \text{ ha}^{-1} \text{ yr}^{-1}$ has been lost (FAO, 2020). Though there is a general trend to reduced deforestation during the last decade these figures are nevertheless of great concern, considering the important role of forests in climate stabilisation and combatting global warming.

Global market pressures, dietary preferences, and loss and waste along agricultural value chains drive demand for agricultural and forest products, which, in turn, drive deforestation and forest degradation (IPCC, 2019). The deforestation drivers are similar in Africa and Asia (agriculture), while degradation drivers are more similar in Latin America and Asia (timber extraction). Timber extraction and logging causes most global forest degradation (52%), followed by fuelwood collection and charcoal production (31%), uncontrolled fire (9%) and livestock grazing (7%) (Figure 1). Specifically, in Latin America and Asian continents, timber extraction and logging account for greater than 70%, whereas in Africa, emphasis lies on local small-scale activities, i.e., fuelwood collection, charcoal production and livestock grazing in forests are the most relevant factors (Hosonoma *et al.*, 2012, FAO and UNEP 2020). In addition, the impacts of deteriorating forest resources on the hydrological cycle and water retention capacity cause serious threats to tropical forest ecosystems.

In our opinion, it is imperative to decouple environmental degradation and unsustainable resource use from economic growth and associated production and consumption patterns. Commercial actions involving selective logging remain in the focus of global attention to improve operational practices.

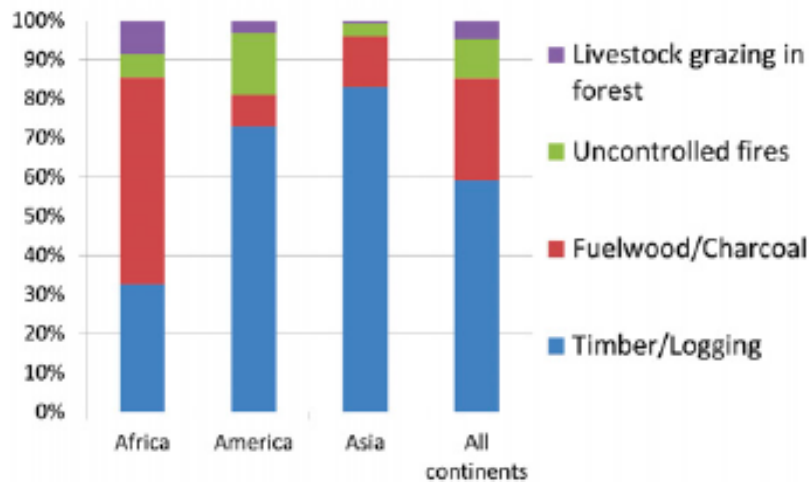


Figure 1: Continental-level estimations of the relative disturbed forest area fraction of degradation drivers based on data from 46 tropical and sub-tropical countries. Adapted from Hosonoma *et al.* (2012).

Conventional timber harvest practices

Timber is a tradable commodity, whether sourced from sustainable or unsustainable sources, and only in extenuating circumstances, will concessions choose long-term environmental benefits over short-term financial revenues (Bach and Gram, 1996; Southgate, 1998). For example, commercial timber concessions in Asia-Pacific harvest higher volumes than other regions in the World, i.e., 50-120 cubic metres per hectare ($\text{m}^3 \text{ha}^{-1}$). Due to the highly selective nature of ‘mining’ trees, production areas in Asia-Pacific need to be larger in size to cover the large number of environmental, social, and economic circumstances (Dykstra and Heinrich, 1996; Pinard and Putz, 1996; Fearnside, 1997; Rice *et al.*, 1997).

Typically driven by a top-down approach from Federal or State-level institutions, concessions receive annual production targets from the government, and failure to meet these targets may result in the lowering of future harvest quotas, or the suspension of the harvest license itself (Bekerman, 1992). The harvest allocations, however, mostly are not based on actual figures of commercial growth and hence, do not support forest sustainability. Simple production targets, coupled with short-term license restrictions, can have devastating effects on the residual standing forest (Putz *et al.*, 2000; Pearce *et al.*, 2003). On the ground, concession holders undertake field reconnaissance to identify the location of merchantable timber, which may or may not use an identified system of recording: a well-known practice is to mis-record protected or valuable species as a less valuable non-protected variety, outside of a protected area, including altered measurements allowing harvesting with reduced royalties. In many instances, timber production supervisors also rely on verbal communication from senior field rangers for descriptions of areas and tree locations, which define the road and infrastructure network. Often harvesting areas are only rudimentarily mapped, and do not identify topographic contours (Wilkie *et al.*, 1992; Klassen, 2001; Sist *et al.*, 2003a).

Contractors form the fundamental component of timber harvesting practices in the tropics, as it is common for licensed concessionaires to sub-contract work to smaller, specialised bodies, i.e., road construction, felling, hauling (Cannon *et al.*, 1994). Sub-contractors are engaged to distribute the high equipment and capital costs evenly across the operations. However, the trade-off results in the surrender of the ability to properly control and supervise operations, including the flow of accurate information.

Soil disturbance from conventional logging is high, specifically relating to slope, skidding distance, soil type, texture, and moisture, as well as the type of equipment and its usage (Dyrness, 1965; Burger *et al.*, 1989; Pinard *et al.*, 2000a). Harvest activities can extensively damage the residual stand, and when compounded with heavy rain, will result in heavy erosion, the blockage of localised streams, and the disruption of hydrologic cycles (Dyrness, 1965; Jusoff, 1992; Boltz *et al.*, 2003). In doing so, forest infrastructure, i.e., road and timber storage areas, are created with high-impact construction methods that do not take into consideration the required environmental criteria, resulting in a labyrinth of roads, connecting the point of harvest to the storage areas (Kammesheidt *et al.*, 2001; Wells, 2001). The creation of forest infrastructure may cover as much as 30-80% of a compartment area, and the tree mortality by uncontrolled skidding, i.e., the pulling of logs from the place of harvest to the storage locations, have been estimated to reach up to 80%, demonstrating the carelessness and unplanned, unsupervised nature of conventional harvest activities (Chai, 1975; Sist *et al.*, 2003a). Financially, road networks are a major investment for the concession holder and are developed specifically for timber extraction operations (TFF, 2006). Primary, secondary, feeder roads, and skid trails, make up the forest road network, and in some cases, are established only after felling is complete (CIFOR, 2002; Boltz *et al.*, 2003).

The crawler tractor or bulldozer is commonly used in the tropics. It is a high-powered, track-based machine typically fitted with a single blade on the front, and a heavy winch mounted on the back. Although automated remote-controlled winches are becoming more common, winch ropes are typically extended manually. Due to the gauge and weight of the cables, two to three people are needed to extend the cable to the maximum length of 30 metres. In many cases however, cables are even shorter, requiring the tractor to make its way to the precise felling location (Cannon *et al.*, 1994), thus causing unnecessary damage to soils and vegetation. In many instances, logs are pulled onto skid trails and feeder roads and left until log production has exceeded operational efficiency of the road, before being skidded to the main log storage area (Wells, 2001). Research has shown that during the early 1970s, 13% of a harvest area is converted into landings, which increased to 40% during the 1980s (Kammesheidt *et al.*, 2001).

Timber fellers frequently do not possess formal training qualifications (Forshed *et al.*, 2006). For example, in Asia-Pacific, 8-15 trees per hectare are felled, representing approximately 50-120 m³ ha⁻¹ (Pinard and Putz, 1996), resulting in 40-70 % damage to trees in the residual forest (Nicholson, 1958; Fox, 1968). Fellers often communicate to the tractor driver directly to instruct where the harvested trees are located, however poor communication can result in high volumes being left in the forest (CIFOR, 2002; Boltz *et al.*, 2003). Moreover, uncontrolled logging has a compound effect on forest wildlife with loss of habitats, composition of original cover, as well as changes in plant community and forest structure (Woods, 1989; Johns *et al.*, 1996).

Gaps in forest certification standards

While the United Nations Conference on Environment and Development (UNCED) was successful in the adoption of three environmental conventions in 1992, i.e., United Nations Framework Convention on Climate Change (UNFCCC), United Nations Convention on Biological Diversity (UNCBD), and the United Nations Convention to Combat Desertification (UNCCD) (IISD, 1995), it was not successful to achieve a legally binding agreement on forests, aspired by leading environmental non-governmental organisations (NGOs) at the time (Cashore, *et al.*, 2003). Led by World Wide Fund for Nature (WWF), global campaigns in the 1980s advocated more responsible management of global forest resources, as deforestation was estimated to average 13 million hectares per year over the decade (FAO, 2007). This resulted in NGOs working together to apply a market-based approach to reduce deforestation, albeit from the application of positive or negative pressure from consumers or corporations, i.e., advocacy of best practice or through financial incentives via commodity premiums, or through boycotts or threats against companies and operations (Van Kooten *et al.*, 2005). The theory behind this method is to create a system of trust amongst the parties in the supply of timber to consumers, i.e., from upstream harvest activities to downstream processing, making commodities from the timber industry more reputable, trustworthy, and transparent, which takes into consideration stakeholder and indigenous rights of those living in and around production forest areas (McDermott *et al.*, 2015; Miteva *et al.*, 2015). These actions are developed by organisations and governments against industry best-practice and are framed as a 'standard' of practice, which are periodically monitored by independent third parties. Collectively, these actions are referred to as 'forest certification'.

The inability to reach agreement on the legally binding treaty on forests at the UNCED led to the global certification movement, beginning with establishment of the Forest Stewardship Council (FSC) in Toronto, Canada, in 1993 (Cashore *et al.*, 2003). Soon after, national and sub-national standards were being established in Canada, i.e., Canadian Standards Association for Forest Certification (CSA), and the United States of America, i.e., the American Forest and Paper Association Sustainable Forestry Initiative (ASFI). However, due to the highly decentralised land-use system, landowners in Europe did not feel the standards established were particularly applicable to their circumstance, thus they created their own system, termed the Pan-European Forest Certification (PEFC), now termed, the Programme for the Endorsement of Forest Certification (Cashore *et al.*, 2003; Van Kooten *et al.*, 2005). The PEFC has become an umbrella group for endorsing national standard systems (McDermott *et al.*, 2015). Together, FSC and PEFC represent the major forest certification schemes globally with the certified area totalling 213 and 320 million hectares, respectively, representing only 13% of the 4 billion hectares of the world's forests (Eden, 2011; BIP, 2015; FSC, 2020a; PEFC, 2020a).

A problem is embedded in the Principles and Criteria of FSC and PEFC Standards themselves, which advocate the implementation of responsible management and RIL, yet do not refer to specific protocols on how forest management planning and RIL should be implemented, including inadequate indicators to assess compliance. This often leads to sporadic or limited understanding and implementation of forest operations by licensees. Moreover, the Auditors from Certification Bodies (CBs) frequently do not possess specific skills in the implementation of management planning, RIL, and other forest operations. Much of their understanding comes from 'on the job learning', which reduces their ability to assess whether or not planning and ground operations are implemented according to the requirements.

It is a common practice that country members of PEFC mandate the implementation of RIL with the recommendation to use third-party RIL operational manuals, many of which are locally created and are weak in terms of technical requirements, i.e., slope restrictions, diameter limit, and maximum allowable harvesting volumes. Moreover, at the sub-national level, states and provinces have different harvest thresholds which creates inconsistencies and misunderstandings. With weaker standards, it is easier to circumvent necessary techniques that reduce impacts on the forest. There have also been instances when Forestry Departments release RIL guidance in both a local and English language, with the local version having weaker requirements.

Forest management planning and RIL implementation under forest certification standards are severely fragmented. This consists of a lack or an inadequate planning approach, as well as limited or no formal training and understanding by practitioners on the rationale for reduced-impact techniques in infrastructure development, harvesting and other forest operations. Too often, the result is poor ground implementation. To compound matters, forest certification auditors frequently have limited technical training in sound management planning methods and RIL, making it challenging to correctly identify the issues and non-compliances during an audit. Moreover, with auditors having to assess a whole range of aspects across the company, they have only limited resources and time to conduct a thorough assessment of planning aspects, RIL operations, silviculture and planting, monitoring, etc. In consequence, the development of a comprehensive training programme forms an important aspect to ensure forest audit teams have adequate knowledge and skills to identify relevant issues quickly and correctly.

Considering these shortcomings, a new holistic and encompassing approach is required to support the responsible management of forest resources across the tropical world, through a substantial and effective effort towards achieving forest sustainability.

A solution: Capacity building and practical training based on core elements of responsible forest management.

The multiple gaps and shortcomings in progressing towards, and eventually achieving, forest sustainability need to be overcome by raising awareness on responsible forest management, and by undertaking holistic capacity building measures using well-structured, state-of-the-art forest management systems, best management practices, and technologies.

ARFM is to be understood as a comprehensive forest management approach designed to strike a balance between the diverse and often conflicting stakeholder interests in forest conservation and forest resource utilisation. The approach comprises a wide range of systems and methods, including forest management planning, field implementation, as well as operational supervision, monitoring, control, and evaluation. The results of evaluation are used to adapt and revise the management planning process over-time. Adequate knowledge and practical skills of the following ARFM Themes and Core Elements (CE) are critical to achieve responsible forestry.

Theme A: Principles of responsible forestry, international conventions, Agreements, and policies

- (CE 1) Understanding the rationale and objectives of ARFM in the global context: framework of international conventions and agreements, national forest policies and related action programmes.

Theme B: Stakeholders in forestry and environment

- (CE 2) Raising stakeholder awareness and understanding, achieving their active support for practicing ARFM: stakeholder mapping, supporting, and cooperating with local communities, consultation, participatory planning, conflict management and resolution.

Theme C: Forest management planning

- (CE 3) Forest management planning: planning levels, hierarchies, authorities organisation
- (CE 4) Forest infrastructure planning and maintenance: roads, camps, workshops, log yards, etc.
- (CE 5) Forest Resource Assessment (FRA), analysis and mapping: terrain, hydrological patterns, soils, landscapes and ecosystems, habitats, species (flora and fauna), biodiversity, timber, and non-timber resources.
- (CE 6) Forest zoning, objective identification and management of forest functions for conservation and protection, production, community use, recreation, research, and education.
- (CE 7) Growth modelling and yield projections, determination target stocks and calculation of Annual Allowable Cut (AAC) in production forests, sustainability at Forest Management Unit and landscape level
- (CE 8) Conceptualising, strategizing and drafting Forest Management Plans (FMP).

Theme D: Forest operations

- (CE 9) Pre-harvesting inventories in production forests: mapping standards, recording parameters of trees to be protected and trees to be harvested, tree locations, buffer zones and other exclusion areas, felling preparations, skid trail alignment.
- (CE 10) Best management practices in forest organisation, forest infrastructure development and maintenance, i.e., roads, skid trails, camps, log yards, waste management, RIL harvesting methods and practices, i.e., skid trail preparation, tree felling and extraction, machinery and equipment, log landings and log storage, log transportation, supervision, post harvesting activities and mitigation measures, forest rehabilitation and silviculture, including regeneration treatment, planting, potential crop trees, liberation thinning, etc.
- (CE 11) Reduced Impact Logging – Field practical training.

Theme E: Forest Monitoring, Auditing and Evaluation

- (CE 12) Monitoring, Auditing and Evaluation of road infrastructure, forest structure, species composition and biodiversity, i.e., flora and fauna, soil conditions and hydrology, forest regeneration, ingrowth and mortality, growth, yield, compliance and quality of plan implementation, social and environmental impacts of forest operations, assessment, and reporting.

Theme F: Forestry technologies, systems, and tools

- (CE 13) This theme overarches CE 1 - 12. Knowledge and application of state-of-the-art current practices as well as future trends all are essential and contribute to ensure an environmentally sound and economically viable, efficient forest operation, in particular: remote sensing applications and image analysis, including satellite imagery, aerial photos, drones and technology, Geographic Information Systems (GIS), Global Positioning Systems (GPS), systems, procedures for infrastructure development, planting, treatment and harvesting, forest management information and monitoring systems, reporting systems, tracking systems for forest products and machinery, options and selection of suitable forest machinery and equipment.

A comprehensive human capacity building programme, consisting of ARFM training modules will be developed, depending on current knowledge levels and the variable needs of individual stakeholder groups. As a result of effective and successful training, these measures will contribute to protect forest resources and their regeneration, help to avoid, or minimise damage, while ensuring the forest continues to provide ecosystem services (van der Hout, 1999; Enters *et al.*, 2001; Putz and Nasi, 2009; Putz *et al.*, 2012). Understanding, knowledge, and support of the ARFM core elements by relevant parties will enable the achievement of responsible forest management practices to all stakeholders. While the Themes and Core Elements are defined, the final frameworks require expert consultation for development and refinement, which aims to be part of the initial work of ARFM.

A practical operational solution: Reduced Impact Logging (RIL)

An example of important ARFM operational activities is forest harvesting, due to its high impact potential on residual forest structure and conditions. In 2002, FAO commissioned a literature review to produce an annotated bibliography on the literature of Reduced Impact Logging (RIL), which critically reviewed the body of knowledge, to define the prescription and its processes. Research on the practise is typically derived from controlled research experiments in primary forests, to contrast the impact of conventional vs. RIL activities (FAO, 2004). In doing so, RIL is defined as, and contains, the following characteristics (Table 1):

“Intensively planned and carefully controlled implementation of harvest operations to minimise the impact on forest stands and soils, usually in individual tree selection cutting” (FAO, 2004, pp. 2).

Table 1: Characteristics of reduced-impact logging. Adapted from FAO (2004). Text in bold indicates key words of each activity for ease of reference.

#	Characteristic
1	Pre-harvest inventory and mapping of eligible crop trees.
2	Pre-harvest planning of forest infrastructure to provide access to the harvest area, and to the individual trees for harvest, while minimising soil disturbance, and protecting waterways with appropriate crossings.
3	Pre-harvest climber cutting where climbers inter-connect with tree crowns.
4	The use of appropriate felling and bucking techniques , including controlled and directional felling.
5	Construction of forest infrastructure that adheres to engineering and environmental design guidelines .
6	The long-distance winching of logs to planned forest infrastructure while ensuring machinery remains on designated paths and platforms.
7	Post-harvest assessments involving monitoring, reporting and verification to evaluate the implementation of the harvest guideline.

Timber inventories are normally implemented in each harvesting compartment, where 100% of all eligible merchantable trees of commercial diameter, i.e., trees ≥ 50 or 60 cm DBH are tagged, identified and recorded to species level. Each compartment must contain a minimum stocking. In some places such as Sabah, Malaysia, a minimum of 16 trees ≥ 60 cm DBH per hectare, with a collective volume exceeding $25 \text{ m}^3 \text{ ha}^{-1}$ is required for harvesting approval (Ong, 2006; SFD, 2009). The inventory defines the basis of the Comprehensive Harvest Plan, which further outlines the history of the area, the soil type, road access, and other physical characteristics of the compartment. The harvest plan identifies the areas to be harvested, their estimated yield, the operational schedule, the equipment to be used, i.e., number of tractors, and the

tractor and skidder type. Tree stock maps are created at the scale of 1:5,000, where the topography, road infrastructure, riparian and prohibited areas, are accurately mapped using advanced Geographic Information System (GIS) and mapping software. Prior to harvesting, areas undergo silvicultural treatment by cutting climbers from trees to be harvested. As vines grow where light penetrates the canopy, the resulting inter-connection of the trees can cause undue damage if they are not cut prior to harvest activities (Putz, 1985; Putz and Mooney, 1991; Pinard *et al.*, 2000).

Constructing forest infrastructure under RIL involves considerations such as topography, conservation areas, and other natural features that can affect environmental attributes both during, and after, harvest activities are completed. The incline of roads and skid trails are typically $<25^{\circ}$ in slope and in some cases $<30^{\circ}$, and the permitted total infrastructure is approximately $<5 - 6\%$ of the area, with a maximum skid trail length of 100 - 120 m ha⁻¹. Long-distance winching of logs is used to avoid the creation of excessive skid trails and 'fish' logs up to 100 m in distance, from where the physical machines are positioned. The machinery is required to stay on roads, skid trails and platforms.

Timber harvest activities involve directional felling techniques to fell trees to into areas where tree fall causes the least amount of damage to the residual stand and the tree to be felled, thereby maximising merchantable timber (Enters *et al.*, 2001). Techniques aim to avoid damage to immature (potential crop) trees and conservation areas, easing the skidding of logs to storage areas, and ensuring feller safety. Following harvest activities, water bumps and cross drains are installed on roads and skid trails to reduce environmental degradation such as soil erosion, and the siltation of watercourses (Ilstedt *et al.*, 2004; Ampoorter *et al.*, 2010). To ensure the natural water flow, which can assist natural forest regeneration, temporary stream crossing structures, such as bridges and culverts, are removed. Third-party monitoring of operational and environmental compliance is implemented at the planning and operational stages, i.e., the development of the harvest plan, and its implementation, to ensure prescriptions match operational outputs.

In comparison to conventional harvesting activities, RIL has been found to reduce damage to soils by up to 50%, and ground disturbance per tree harvested may be reduced by up to 41% (Pinard *et al.*, 2000; Priyadi and Gunarso, 2006; Putz and Nasi, 2009). Moreover, the area of forest infrastructure has been estimated to be reduced by as much as 40%, as a direct result of pre-harvest planning of forest infrastructure and skidding operations (Klassen, 2001). Along with the reduction of canopy loss, RIL can increase wood recovery from directional felling, resulting from more timber per tree harvested (Winkler, 1997).



How Tropical Forest Foundation supports the Alliance for Responsible Forest Management

Tropical Forest Foundation (TFF) was formed in 1990 as a result of a Smithsonian Institution workshop that brought together leaders of industry, science, and conservation to address the growing concern for the protection of tropical forests. TFF was established to foster dialogue and alliances between industry groups, improve tropical forest management, and enhance the economic value of tropical forests. Upon its inception, TFF established itself as an international organisation dedicated to promoting tropical forest conservation and management through education and training. By 1993, TFF teamed with Instituto do Homem e Meio Ambiente da Amazônia (IMAIZON) and Caterpillar, Inc. to research the benefits and costs of RIL near Paragominas, Brazil. The following year TFF established a field program to promote RIL methods throughout major tropical forest of the Amazon. The Brazilian subsidiary of TFF, Fundacao Floresta Tropical (FFT), implemented the programme through demonstration, training, and research and documentation.

Developing training programs in sustainable forest management through the implementation of RIL soon became the primary focus of TFF. Since 1996, more than 1,400 individuals from logging companies, universities, and government agencies have received TFF RIL training in Brazil alone. In addition to improving logging practices, TFF is engaged in research to increase the commercial value of tropical forests that have been logged. The success of the program was largely due to the collaborative effort of a diverse, yet balanced, group of industry and non-industry organisations represented on the TFF Board of Directors. Former Board members include individuals from organisations such as the Center for International Forestry Research (CIFOR), the International Union for the Conservation of Nature (IUCN) The Nature Conservancy (TNC), the United Nations Development Program (UNDP), Indonesian Wood Panel Association (APKINDO), the Sarawak Timber Association (STA), the International Tropical Timber Organisation (ITTO), and Caterpillar and its affiliates, TRAKINDO – the authorised dealer of Caterpillar products in Indonesia, and Tractors Malaysia.

In 2000, TFF expanded its activities by starting a Asia-Pacific program based in Indonesia. In 2002, another regional program in RIL training was initiated in Guyana. The programme was in partnership with the Guyana Forestry Commission and the Guyana Forest Products Association. The Guyana project revolves around the establishment of a training site on an operating concession but also includes extension training to individual companies both in Guyana and in neighbouring Surinam. A further expansion occurred in early 2004 with the initiation of a Regional training program based in Gabon, West Africa whereby TFF secured a grant from the U.S. Agency for International Development (USAID), U.S. Forest Service (USDA), to initiate a pilot project for RIL training in West and Central Africa. The project was in partnership with the Wildlife Conservation Society (WCS) and FORM Ecology Consultants. The TFF project in Africa extends beyond RIL training to encompass all aspects of concession management. The involvement of WCS ensured concerns for wildlife conservation in the Congo Basin were incorporated into the project concept.

The TFF attracted significant international support in their work to promote RIL to the global community. In 2004, they engaged in a training project co-funded by the ITTO and the Government of Indonesia. The project was aimed to increase the awareness of key forestry sector stakeholders-managers, strengthen capacity of forestry institutions to promote and facilitate the implementation of RIL, support the establishment of a corps of forest technicians, supervisors and forest workers trained in practical techniques of implementing RIL and enhance opportunities for forest certification. The project successfully delivered the outputs, including five detailed technical RIL manuals and supported the certification of the second concession in Indonesia to achieve FSC certification, i.e., PT. Erna Djuliawati, consisting, a natural forest concession consisting of 184,206 ha in Central Kalimantan. To-date, TFF has supported 25 companies in Indonesia to achieve FSC certification, with a total area of 1.8 mil ha certified (TFF 2020). Due to high cost of administration, the Headquarters of TFF International in Washington D.C. closed in 2016. Soon after the offices in both Brazil and Gabon were also closed. Tropical Forest Foundation Indonesia, registered by the late Art Klassen, is the only office maintaining operations, which is now managed by Dr Hasbie Hasbillah (TFF 2020). We conclude that TFF has delivered an important contribution to training of forest managers and workers on the aspect of conducting RIL operations in an environmentally sound manner. On the other hand, passion in the continuation of RIL training in the tropics at global scale has gradually faded over the years.

Considering the continued loss of tropical forests and progressing degradation happening in many remaining commercial forests during the last decade, the important lesson-learnt is that practicing RIL alone cannot save the forests. There is an urgent need for essential stakeholders in tropical forest conservation and management to understand and actively support the need for ARFM. A much wider, more comprehensive approach is needed to achieve and sustain success in responsible forestry over a much larger area. This can be achieved by incorporating the ARFM themes into a holistic human capacity building programme for tropical forest management.



How Climate Forestry supports the Alliance for Responsible Forest Management

Climate Forestry Limited (CFL) has been supporting TFF for the past 15 years on all aspects of RIL, certification, monitoring and carbon. In 2019, TFF appointed Dr Michael Galante, the Director of CFL, as the Chief Technical Advisor (CTA) to create the ARFM. Climate Forestry focuses on four sub-sectors of the forestry industry.

Forest management strategy and optimisation

Climate Forestry specialises in the development of strategic forest management plans to assure long-term responsible forest stewardship. To do so requires a deep understanding of spatial and temporal forest dynamic of the forest, including the historical and current influences and pressures, to define operational constraints and, most importantly, the opportunities for improved forest management.

Forest certification and timber legality assurance

Since its introduction in the early 1990s, the number of certified forest operations has steadily increased. Certification requires operational commitment to ensure the economic, environmental, and social components are in-line with global and local certification principles and criteria. This requires organisations to incorporate basic timber legality frameworks, and incrementally, introduce activities to meet certification principles and criteria. Climate Forestry supports local and international organisations meet the requirements of domestic and international forest and legality standards.

Financial strategy and capital raising

Predictable, reliable and sustainable finance is required for long-term responsible forest stewardship. Combined with improved forest management and forest certification programmes, Climate Forestry supports the development of innovative financial strategies, restructuring and capital raising to support organisations maintain their operations over long-term operational cycles. Climate Forestry aligns the objectives of our clients to key companies in our network of professional organisations to create unparalleled financial support activities and programmes of work.

International conventions and environmental agreements

Climate Forestry supports policies and project-based activities to assure compliance to International Conventions and Environmental Agreements. Climate Forestry supports the United Nations Framework Convention on Climate Change (UNFCCC) whereby 'improve forest management' is an effective and cost-efficient activity to mitigate anthropogenic climate change. Climate Forestry supports the Convention on Biological Diversity (UNCBD) to conserve biodiversity, ensure sustainable use, and encourage fair and equitable sharing of the benefits arising from the use of genetic resources. Climate Forestry supports the United Nations Forum on Forests (UNFF), to promote responsible management, conservation and sustainable development of all types of forests. Climate Forestry supports the Bonn Challenge to bring 150 million hectares of the world's deforested and degraded land into restoration by 2020, and 350 million hectares by 2030, and the New York Declaration on Forests (NYDF) to halve deforestation by 2020 and to end it by 2030.



Alliance for Responsible Forest Management

Mission

To accelerate responsible forest management across the commercial tropical world and contribute to reducing greenhouse gas emissions from entering the atmosphere from the forest sector.

Vision

To create a coordinated global support network promoting awareness, training, and implementation of best management practices for responsible forest management.

Rationale

Deforestation rates and forest degradation in the tropical region are alarming and raise great concern over forest sustainability and their contribution to combat global climate change. Evidence clearly suggests that much more effort is needed to reduce forest degradation from timber harvesting in most regions of the world (Hosonoma *et al.* 2012; FAO, 2020). The need for responsible forest management as a contribution to achieve long-term forest survival and sustainability is more urgent than ever before. Unfortunately, knowledge about best forest management practices in the tropics are still falling short of international requirements, despite progress made in specific areas over the last three decades. Only a minor fraction of tropical forests has been certified, leaving much to be accomplished. Severe gaps have been identified in sound forest management planning, forest operations and in forest certification standards, i.e., FSC and PEFC, whereby responsible forest management is required yet limited guidance on planning aspects and practical implementation are provided.

The establishment of the Alliance for Responsible Forest Management (ARFM) shall address this urgent need by applying over 30 years of peer-reviewed research and applied knowledge to produce regionally appropriate best practice manuals on the themes and core elements of ARFM. The ARFM concentrates on commercial tropical forestry applications in natural forest, planted forest, conservation forest and rehabilitation of degraded forest. While some guides on various aspects have been created in the past emphasizing on RIL operations, most are over 20 years old, out-of-date and require significant revision to reflect current approaches to responsible forest management (FAO 1999; Elias 1999, 2001; TFF 2006a, 2006b, 2006c, 2005, 1999). In addition, there is a lack of similar guidelines that address stakeholder awareness and integration, forest management planning systems and methods, forest operations other than RIL, as well as forest monitoring and evaluation. The organisation shall develop a comprehensive set of training modules and guides covering all ARFM core elements developed for forest managers and practitioners, Certification Bodies (CBs) and forest auditors through classroom-based (virtual and/or in-person) and on-site practical training in regional-specific training centres, i.e., Africa (Gabon), Latin America (Brazil), Asia-Pacific (Indonesia).

Market size and segments

There are approximately 200 million ha tropical forests globally designated for production activities (Poker and MacDicken, 2016). With most commercial production forests in the tropics harvested at least once, training on sustainable timber harvesting in logged-over degraded forests is needed. Moreover, FSC and PEFC represent 213 and 320 million hectares of certified forests, respectively, with 7 % in the tropics, i.e., 13 and 17 million, respectively, or 30 million ha collectively (FSC, 2017; Global Canopy, 2017). Broadly, this indicates 170 million ha of commercial tropical forest would still require guidance and support to ensure they are on the road to responsible forest management and sustainability. To support the immense size of this task, ARFM shall register the organisation as an international not-for-profit non-governmental organisation. Thereafter, the inception work of the organisation will comprise of two activities, i.e., defining best practices, and training and outreach.

a) Defining best management practices

Over the past 30 years, much work has been done to develop and refine environmental guidelines for controlling and reducing forest damage. While a large number of publications have been written, they only address a single (though important) aspect of the forest management cycle. Many of these documents are dated and contain prescriptions that do not match current approaches and technologies any longer. With the aid of the Technical Advisory Council ([Figure 2](#)) and the international stakeholder review process, ARFM aims to integrate previous work into a series of regionally specific best-practice manuals. Wherever possible, the documents shall incorporate quantifiable research metrics for statistical analyses and gap identification in implementation, enabling a constant improvement of practices over-time. All manuals will be translated into in major languages used in each region and in the field, respectively, i.e., Bahasa Indonesia, Bahasa Melayu, English, French, Mandarin, Portuguese and Spanish. Depending on identified needs the manuals aim to be updated at intervals of 5 years to incorporate changes in policies, regulatory framework, technologies, and practices. Regular reviews shall be conducted to ensure the manuals remain state-of-the-art, are supportive to users and effectively quantify indicators to analyse best management practices.

b) Training and outreach

In select Provinces and States across the tropical world, training in forest management practices including RIL does exist, yet the standards to which the training is conducted are often inconsistent or unknown (Putz *et al.*, 2000; Klassen 2001). The ARFM shall offer objective, structured and encompassing technical training to the following: a) forest licensees and sub-contractors; b) Certification Bodies and auditors; and c) staff of forest-related government agencies and non-governmental organisations (NGOs). Training will consist of both theory and practical components, with theoretical aspects administered through either virtual or in-person participation, and practical in the field. The work will be administered through two approaches:

1. On-site at a specific concession:

When a licensee requests ARFM to travel to their concession to provide licensee-specific training; and,

2. Regional Headquarters and Regional Training Centre:

ARFM will coordinate parties from the region, approximately 20-30 participants at a time, to join training at the Regional Headquarters and Field Training Centre.

The rationale for [Approach 1](#) is that some companies prefer to train their staff in their own forest area, and the rationale for [Approach 2](#), is regarding companies and staff that want to travel to the Regional Field Training Centre to learn from others in a more formal and international setting. Many of the manuals of the ARFM Themes and Core Elements will need to be developed by ARFM experts and also international experts by applying data from existing guidelines and manuals, as appropriate, and by integrating these with relevant additional information of the respective ARFM Theme. Training modules for RIL shall originate from TFF, but these also need to undergo comprehensive review and updating to include recent advances in procedures and technologies. Current RIL modules consists of seven, eight and five days, respectively i.e., 20 days in total. Along with the manual review the duration of theoretical and field training modules will be evaluated based on previous experience and recommendations from course leaders. The modular structure of the ARFM themes and core elements will give clients a choice of either systematic training on all ARFM Themes in a logical, stepwise procedure, or via a selection of individual modules covering clients' specific training needs ([Table 2](#)).

Table 2: Overview and duration of training modules.

Theme	Description	Duration (days)
A	Responsible forestry, conventions, agreements, and policies	3
B	Stakeholders in forestry and environment	3
C	Forest management planning	8
D	Forest operations	15
E	Forest monitoring, auditing and evaluation	3
F	Forestry technologies, systems, and tools	3
Total		35

Concerning the **mode of training**, virtual training will be used to support physical classroom attendance, i.e., to reduce costs and due to the COVID-19 pandemic, and in-person attendance will be administered on a case-to-case basis of the needs of the client. All virtual training will be facilitated through the Secretariat. After participants successfully satisfy the theoretical requirements of the training, they will progress to the field. Field training shall consist of a defined programme of work, coordinated with the **Regional Training Centre**. Based on the history of TFF, the training centres could be based in the same former locations, i.e., Gabon representing Africa, Brazil representing Latin America, and Indonesia representing Asia-Pacific. The order of opening each centre will depend on funding capacity, interest from Forestry and Timber Associations and other practical and financial considerations. Training will be conducted in languages specific to the needs of the participants, i.e., French and Mandarin in Africa, where French and Chinese speaking contractors are implementing harvest operations.

Justification for a new organisation

Besides domestic forestry schools and colleges, there are a limited number of organisations specialising in the theory and training of RIL, but none of them addresses the whole forest management cycle. In certification auditor training courses facilitated by CBs, there are limited efforts to meet the theoretical and technical requirements of operational best practice. In the past, standard systems have been established by NGOs or corporations in conjunction with international NGOs. While this approach has received general public support, it does not embrace all involved parties in a balanced manner, nor does it integrate the different views and perceptions of a diverse stakeholder community. In addition, standards developed by a single stakeholder group with specific interest, i.e., in conservation or forest utilisation, compromise the standard acceptance by other stakeholders, resulting in a dominating group render them inflexible for changes and do not necessarily contribute to the originally desired outcome of universal applicability. **The proposed ARFM best-practice manuals and regional training centre approach do not have any influence from specific groups** and its underlying standards will be subjected to international consultation and peer-review, utilising decades of forest research and practical experience in field implementation. **The creation of an integrated ARFM approach with modular training components addressing the entire forest management cycle can render a long-term contribution to resolve the gaps in stakeholder awareness, best management practices, operational implementation, and capacity building.**

Our advantage

The advantage of establishing ARFM originates from the vast amount of historic work done by TFF and its team of professional experts to standardise best management practices. For over 30 years, TFF has been leading the forest industry in training licensees and organisations on RIL. The difference between the previous TFF model and the innovative ARFM model is that significant lessons have been learned regarding the gaps and shortcomings, necessary scope and comprehensiveness of training, as well as sustainable funding and reduction of management costs. Furthermore, the ARFM can integrate any existing and proven best management practices of other relevant forestry organisations into its professional manuals and course modules. Due to the urgency of required action on combatting anthropogenic climate change, there is a renewed push by the international community to support responsible forest management, in particular by larger organisations such as FSC, PEFC, the High Conservation Value Network (HCVN), as well as inter-governmental cooperation and development agencies. Moreover, for the past 15 years, TFF Indonesia has been supported by Climate Forestry Limited (CFL) on multiple aspects of RIL and carbon issues. **In 2019, CFL was asked to become the Chief Technical Advisor (CTA) of TFF to support operations and the creation of ARFM.** Climate Forestry is a specialist professional forestry company with programmes of work to optimise operational forest management, support forest certification and timber legality assurance, develop and implement sustainable financial strategies, and support organisations to meet the requirements of International Conventions and Environmental Agreements. Climate Forestry collaborates closely with a network of research organisations, certification organisations, and professional experts with specialist knowledge and track record in the field of forests, environment and climate stabilisation. Through this network CFL has the capacity to actively support the successful development and operation of the ARFM Organisation.

Organisation

Overview

The ARFM shall be established as a charitable Organisation limited by guarantee, such that it is independent and can enter into agreements and hold property, as applicable. It also provides a certain level of protection for the Members, Supporters and Trustees of the charity. The Headquarters is considering registering in Bali, Indonesia, which offers many benefits to establishing business operations, as well as a thriving international NGO community. The island has excellent international transport links and is generally less expensive than other regional hubs such as Singapore, or Kuala Lumpur. However, ARFM would consider locating to another jurisdiction should a Member offer to host the Secretariat on an in-kind basis.

The structure of the Organisation will consist of a Members and Supporters model, with the aim of using a General Assembly for reporting and decision making at the highest level (Figure 2). The core of the work will be facilitated through a dedicated Secretariat and various Councils will be formed to support the Organisation. This includes the creation of a Finance and Accounting Council, a Dispute Resolution Council, a Research and Monitoring Council, a Technical Advisory Council, a Members Liaison Council, a Governance and Nominations Committee, a Finance and Accounting Council, and others as needed and as necessary (Figure 3) (HVC 2020, FSC 2020b, PEFC 2020b). Statutes and other regulatory requirements shall be drawn-up once the formal formation of ARFM begins.

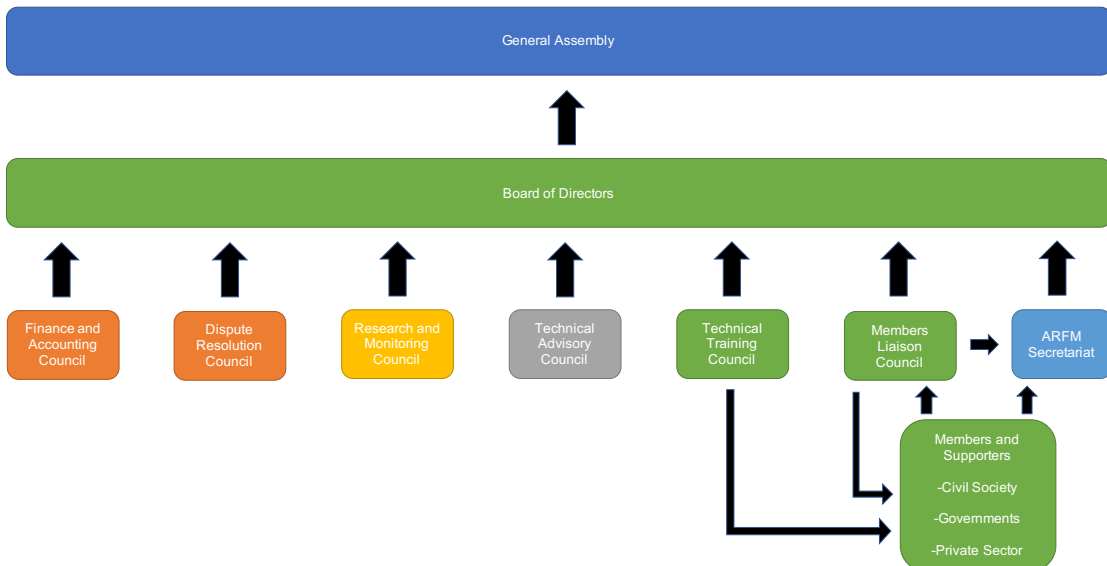


Figure 2: Draft Organisation chart of the Alliance for Responsible Forest Management.

One of the innovative Councils to be established is the Research and Monitoring Council, tasked with investigating data received from Members on the implementation of RIL. During the creation of the best practice manual, ARFM aims to integrate Criteria and Indicators with quantifiable traits to support research and monitoring of compliance. To our understanding, this has yet to be done and although there are quantifiable mechanics that can be used, i.e., number of broken trees per log removed, machine hours per tree removed, etc., quantifiable indicators are not in the in-seam of Criteria and Indicators, per se (FAO 1999; Elias 1999, 2001; TFF 2006a, 2006b, 2006c, 2005, 1999). This will be facilitated by the Technical Advisory Council and the drafting team. Moreover, it is envisioned for all ARFM Members to establish a network of Permanent Sample Plots (PSPs) employing a standardised set of recording parameters, and to forward the collected data to the ARFM Secretariat for analysis of compliance and performance. The results will enable an improved understanding of the emerging gaps and the need for more support of practitioners. The establishment of PSPs and data collection of will form part of the training module.

The outputs of compliance and PSP monitoring can support existing global monitoring programmes such as the Tropical Managed Forests Observatory (TmFO), a pan-tropical network aiming at understanding the long-term effects of logging on tropical forest ecosystems. The establishment and measurement of ARFM Members can support the investigation of the response of tropical forests to logging, in terms of biomass dynamic, timber volume recovery and changes in species composition over time. This provides a unique opportunity to gain an enhanced understanding and compare forest responses at both regional and continental scales. These results will provide a strong basis for policy and standard development and forest practitioners are enabled to build up new guidance towards responsible and sustainable forest management (TmFO 2020). Additional global research and reporting initiatives will also be explored to better understand how ARFM can support the international community and streamline reporting mechanisms to improve the understanding and practice of ARFM. This may include, but is not limited to, exploring how ARFM can support Science-based Targets, a way of boosting companies' competitive advantage in the transition to the low-carbon economy, or the Global Reporting Initiative, to support voluntary sustainability reporting (SBTI 2020, GRI 2020).

Members and Supporters shall be broken down into Non-profit and for-profit organisation categories and defined by the Gross National Income (GNI) of the country where they are resident. To define the annual fees to Members, we attribute four income classifications, i.e., low, low-middle, upper-middle, and high, using World Bank country classifications. Classification is based on where the head office is registered. For the current 2021 fiscal year, low-income economies are defined as those with a GNI per capita of USD 1,035 or less in 2019; lower middle-income economies are those with a GNI per capita between USD 1,036 and USD 4,045; upper middle-income economies are those with a GNI per capita between \$4,046 and \$12,535; high-income economies are those with a GNI per capita of \$12,536 or more (WB 2020) (Table 3).

Table 3: Member and Supporter fees for the Alliance for Responsible Forest Management. N.A. is defined as not applicable. Adapted from HCVN (2020), FSC (2020b), PEFC (2020b), WB (2020).

Category	Annual turnover (USD million)	Annual fee based on country of residence income category (USD)			
		Low	Low-middle	Upper-middle	High
Non-profit Member					
Very large	>100	1,200	2,400	3,600	4,800
Large	25-100	600	1,200	1,800	2,400
Medium	5-25	300	600	900	1,200
Small	1-5	150	300	450	600
Micro	< 1	75	150	225	300
For-profit Member					
Very large	>100	3,200	6,400	9,600	12,800
Large	25-100	1,600	3,200	4,800	6,400
Medium	5-25	800	1,600	2,400	3,200
Small	1-5	400	800	1,200	1,600
Micro	< 1	200	400	600	800
Supporters					
Government	N.A.				
NGO	N.A.				
Private company	N.A.	150	200	250	300
Individual	N.A.				

Management team

To-date, the launching of this initiative has been initiated by two organisations, namely, CFL and TFF. To-date, CFL has undertaken the technical review of the TFF RIL manual and conducted a critical analysis against International FSC and PEFC Standards of compliance. To kick-off the ARFM work the interim TFF RIL Manual was revised to be more consistent and aligned with the Principles and Criteria. To gain initial traction on the best way to form ARFM, CFL and TFF formed an informal RIL Technical Working Group (TWG), and complemented by the ARFM Executive Board to support the development and establishment of the Organisation.

The Reduced-Impact Logging Technical Working Group (RIL TWG)

Initially designed to continue its focus on RIL the TWG was tasked to support the development of ARFM and advocate the benefits of its implementation to international- and local- organisations. Support was demonstrated by participating in a row of TWG meetings, framing the organisation at the international level, and support the drafting of proposals to finance the revision and global consultation of the best practice manual. Following intensive discussions about the scope of the organisation the ARFM Executive Board has unanimously agreed to widen the scope of the ARFM Organisation, and include the whole forest management cycle into its human capacity building programme, with RIL becoming one out of several core training elements of responsible forestry.

The TWG is Chaired by CFL and TFF, and Members are organised by organisation type, i.e., international, private, and non-governmental. Invited members were based on their demonstrated professional capacities in their respected fields of expertise, i.e.,

technical RIL capacity, forest standards, assurance and forest certification bodies, forest finance capital raising, advocacy and engagement with international organisations and institutions, etc. Members offer opinions, support and lessons-learned from previous professional positions to support the development of ARFM. Decisions are made by consensus and in the case of inability to reach consensus, the TWG Chair takes the final decision. The TWG is responsible for the following: a) Defining the institutional framework of the Organisation; b) Defining the structure of the Assurance programme for the Organisation; c) Defining how the Organisation shall receive monies, i.e., royalties - a per cent of certification fees from FSC/PEFC certificate holders, or applying 'membership' and 'supporters' structure, with annual fees, or other options as appropriate; d) Support the drafting of funding applications to identified organisations. Five meetings of the TWG were held, allowing the TWG to build understanding and consensus on the institutional framework of ARFM ([Appendix I](#)). Both FSC International and PEFC International supported this initiative, as well as two certification bodies, i.e., Soil Association and NepCon. All Members are in consensus with the formation of ARFM.

Technical Working Group (with voting rights)

1. Dr Michael Galante, Director, Climate Forestry Limited (Malaysia) (TWG Co-Chair).
2. Mr Hasbie Hasbillah, Executive Director, Tropical Forest Foundation Indonesia (Indonesia) (TWG Co-Chair).
3. Dr Bernd Hahn-Schilling, Director, International Forest Management Consultants Sdn Bhd (Malaysia).
4. Mr Adam Grant, Director-Market Development, NepCon (United Kingdom).
5. Ms Emily Blackwell, Technical Manager, Soil Association (United Kingdom).
6. Mr Paul Hol, Chairman, Form International (The Netherlands).
7. Mr Tieme Wanders, Senior Forestry Expert, Form International (The Netherlands).
8. Mr Rob Ukkerman, Independent, (The Netherlands).

Technical Working Group Observers (without voting rights)

1. Mr Hartono Prabawo, Country Manager, Forest Stewardship Council (FSC) (Indonesia), representing FSC International.
2. Mr Richard Laitly, Regional Director, Programme for the Endorsement of Forest Certification (PEFC) (Australia), representing PEFC International.

The ARFM Executive Board (EB)

1. Dr Michael Galante, Director, Climate Forestry Limited (Malaysia) (Secretary-General of the ARFM).
2. Mr Hasbie Hasbillah, Executive Director, Tropical Forest Foundation Indonesia (Indonesia) (Co-Chair of the EB).
3. Dr Simon Shackley, Independent (Scotland) (Co-Chair of the EB)
4. Dr Bernd Hahn-Schilling, Director, International Forest Management Consultants Sdn Bhd (Member) (Malaysia).
5. Mr Jim Leitch, Independent (Member) (New Zealand).
6. Mr John Carpenter, Independent (Member) (USA).

Marketing and sales

The Membership of ARFM is aimed to be based on a Members and Supporters model with incomes originating from annual fees, donations, and training services. Members are defined as those paying to participate in the General Assembly and vote on various issues, i.e., forest licensees, NGOs, practitioners, etc. Supporters are defined as those that wish to support ARFM without voting rights, i.e., downstream wood manufacturing, distribution companies, consumers, individuals, etc.

The bulk of the money is expected to come from training of Members, organisations, NGOs, CBs, licensees, and forestry related government agencies. It is expected that companies certified to FSC or PEFC should, in theory, be competent to implement RIL at a minimum. As a first step, ARFM shall request auditors from CBs to undertake training in relevant ARFM training modules. Thereafter, when conducting a field audit and identify any issues, the auditor may recommend the licensee for training by ARFM. Thereafter, during the surveillance audit, should the auditor find a similar issue, specific training may be required and can be arranged with ARFM directly.

Participants completing one or more specific training module(s) will receive a certificate of completion valid for **three (3) years**. The rationale behind the timeframe is because operational staff tend to be transient and do not stay in one company for long periods of time. For assurance of compliance, ARFM believes the certificates of planning and operational staff should be maintained in companies certified against FSC and PEFC. Moreover, it is in the best interest of auditors and CBs to refresh their certificate which will enable them to keep abreast with new developments in best management practices. Lastly for Members that are certified against FSC/PEFC, the three-year gap is aimed to fall between main audit years, i.e., under FSC, main audits are every five (5) years and surveillance audits annually. This way, training and capacity building are continuously implemented over time.

Milestones and metrics

Milestones for development

Table 4: Milestones for the development timeline of the ARFM

Year	Month	Activity	Indicators of success
2022	Jan-Aug	Identify granting Members	≥ three (3) Members
	Jan-Dec	Continual acquisition of Members and Supporters	Acquire new Members and Supporters
	Jan-Dec	Receive grants	Secure ≥ USD 450,000
	Jan-Dec	Establish Headquarters, BoD, and various Councils	Establish Headquarters, BoD, and various Councils
	Jan-Dec	TWG to draft regional-specific RIL best-practice manuals	Complete regional-specific manuals
	Jan-Dec	Develop, review and revise training modules	Finalise training modules
	Dec	Launch Headquarters and training centre	Begin operations
2023	Jan-Mar	International stakeholder consultation on best-practice manual(s)	Finalise international stakeholder consultation
	Jan-Dec	Receive grants	Secure ≥ USD 150,000
	Jan-Dec	Continual acquisition of Members and Supporters	Acquire new Members and Supporters
	Mar-May	Incorporate comments into revised manual(s)	Finalise manual(s)
	Jun	Launch best-practice manual(s)	Launch best-practice manual(s)
	Jun-Dec	Inception Council meetings	Inception Council meetings
Jul	Inception training	Inception training	
Aug-Dec	Conduct training	Conduct training	
Dec	Inaugural ARFM General Assembly	Inaugural ARFM General Assembly	
2024 to 2026	Jan-Dec	Continual acquisition of Members and Supporters	Acquire new Members and Supporters
	Jan-Dec	Receive grants	Secure ≥ USD 150,000
	Jan-Dec	Conduct training	Conduct training
	Jan-Dec	Council meetings	Council meetings
	Jun	Annual research and monitoring symposium	Annual research and monitoring symposium
	Dec	ARFM General Assembly	ARFM General Assembly

Financial plan and forecast

Three avenues for income are envisioned to help finance ARFM, i.e., Members, Supporters and Training activities (Table 5). Kindly refer to Appendix 3 and the supplementary information for the full financial details.

Members: Members with voting rights at the General Assembly. Annual participation fees vary pending on the type of membership, i.e., private timber harvest companies, private forestry companies, NGOs, financial institutions, government, etc. (Table 3).

Supporters: Members without voting rights at the General Assembly. Annual participation fees vary pending on the type of membership, i.e., private small, private big, NGO, individual and government (Table 3).

Training: The bulk of incomes are expected to be generated via training modules implemented in either Regional Training Centres or in individual forest concessions upon request organisations. Should the CBs find major issues with the implementation of forest operations, they can also recommend training by ARFM before the follow-up audit.

Initial costs are related to the registration, technical review of the best practice manual, conducting the international stakeholder review, opening the Regional Training Centre and communication activities. The ARFM aims to secure at least five Members, each willing to grant ≥ USD 150,000 in seed funding (MS excel file). Once interest is established by the international community, this Business Plan shall be revised to reflect the technical and practical inputs by the interested parties. It must be highlighted that the projections are based on assumptions and likely in-practice, costs will be higher. All surplus monies shall be reinvested into ARFM, as appropriate.

Table 5: Financial projection for the establishment of the Alliance for Responsible Forest Management over the initial five-year period.

Item	2022	2023	2024	2025	2026
Benefit					
Member grants	450,000	150,000	150,000	0	0
Members	48,325	45,200	28,025	11,000	5,325
Supporters	1,450	3,400	4,200	2,300	2,450
Training	0	260,000	660,000	1,170,000	1,430,000
Sub-total	499,775	458,600	842,225	1,183,300	1,437,775
Costs					
Headquarters and office	100,300	436,500	434,500	434,500	434,500
Development of Best-Practice Manual and training modules	251,000	10,000	0	0	0
Training	0	182,640	426,600	751,880	894,520
Sub-total	351,300	629,140	861,100	1,186,380	1,329,020
Net revenue before tax	148,475	(170,540)	(18,875)	(3,080)	108,775

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Appendix I

Meeting Minutes of the Reduced-Impact Logging Technical Working Group

Meeting Minutes of the Reduced-Impact Logging Technical Working Group are available upon request.

Appendix II

Letters of support for the establishment of the Alliance for Responsible Forest Management



Spear House
51 Victoria Street
BRISTOL
BS1 6AD

www.soilassociation.org/forestry

Re: Letter of support for Tropical Forest Foundation Indonesia establishment of a dedicated RIL organisation

To Whom it may concern,

Soil Association has been part of the RIL Technical Working Group facilitated by Tropical Forest Foundation Indonesia since its inception in early 2020 and have attended all meetings. We support Tropical Forest Foundation Indonesia in their goal to find funding for the establishment of a new RIL focussed Organisation.

It is our understanding that the new Organisation aims to submit funding applications to relevant institutions and funding bodies such that it can begin the first steps towards full development. The inception stage shall consist of three parts: 1) Literature review; 2) Stakeholder consultation; and, 3) Registration of the new Organisation.

The correct implementation of Reduced Impact Logging is critical to ensure that responsible forest management is achieved in the tropics. The global mission of this new organisation to advocate best-practice, conduct training, and promote sustainable and responsible reduced-impact logging (RIL) practices across the tropical world is of great importance.

Yours sincerely

Emily Blackwell
Forestry Technical Manager



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NEPCon Ltd
49-51 East Road
London
N16AH
www.preferredbynature.org

Letter of support for Tropical Forest Foundation Indonesia establishment of a dedicated RIL organisation

To Whom it may concern,

Preferred By Nature (Nepcon Ltd) has been part of the RIL Technical Working Group facilitated by Tropical Forest Foundation Indonesia since its inception in early 2020 and have attended all meetings. We support Tropical Forest Foundation Indonesia in their goal to find funding for the establishment of a new RIL focussed Organisation.

It is our understanding that the new Organisation aims to submit funding applications to relevant institutions and funding bodies such that it can begin the first steps towards full development. The inception stage shall consist of three parts: 1) Literature review; 2) Stakeholder consultation; and, 3) Registration of the new Organisation.

The correct implementation of Reduced Impact Logging is critical to ensure that responsible forest management is achieved in the tropics. The global mission of this new organisation to advocate best-practice, conduct training, and promote sustainable and responsible reduced-impact logging (RIL) practices across the tropical world is of great importance.

Your Sincerely

A handwritten signature in black ink, appearing to read "Adam Grant".

Adam Grant





Appendix III

Cash flow for the establishment of the Alliance for Responsible Forest Management.

Please refer to the supplementary information, Microsoft Excel Spreadsheet:

017-002b_ARFM_Financial model_public_210427.xlsx



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