HCV Network

Scaling the Forest Integrity Assessment tool:

Insights and actions after 20 years of application

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Executive Summary

For more than two decades, the Forest Integrity Assessment (FIA) tool has provided small-scale foresters, plantation managers, communities and others with a low-cost, accessible method to monitor forest biodiversity across temperate and tropical forest ecosystems in over 20 countries. Developed by HCV Network (HCVN) and WWF, the tool enables non-experts to assess forest conditions using a checklist-based methodology, and offers a practical, adaptable and effective alternative to complex biodiversity surveys. FIA's core strength lies in its simplicity, usability, and relevance across a range of forest contexts.

In 2025 HCVN conducted a comprehensive review of FIA to evaluate current usage, gather feedback, and identify opportunities for improvement and wider adoption. This review found strong user confidence in FIA's practicality, emphasising its ease of training, accessibility of its use and implementation with indigenous people and forest communities, as well as the clarity and interpretability of its results to inform management actions.

Among the challenges identified were inconsistent use of checklist components, limited access to FIA forms and guidance materials, and a reliance on paper-based data collection. Users requested technical improvements such as digitisation (including a mobile app with offline functionality), better sampling guidance, and tailored checklists for specific ecosystems. To expand its relevance and impact, users also strongly supported incorporating ecosystem services and social and cultural values into FIA.

To address these needs, we have outlined a roadmap and action plan for FIA improvements focused on four priority areas:

1. Digitising the tool to enhance usability, data accuracy, and analysis
2. Adapting the tool for new ecosystems and geographies
3. Creating a centralised FIA Resource Hub to house manuals, checklists, training materials and scientific evidence; and
4. Integrating ecosystem service and cultural values to align with broader forest management and community needs.

The roadmap also identifies enabling conditions for broader adoption, including national monitoring programs and strategic alignment with sustainability standards, voluntary carbon and biodiversity credit schemes.

Immediate next steps include hosting the FIA Resource Hub on the HCVN website, updating guidance materials, developing a tech-based platform, and advocating for greater integration and recognition of the FIA tool in policy and certification systems. These actions aim to unlock FIA's full potential as a globally relevant, inclusive, and scientifically sound tool for measuring the ecological condition of natural forests and tracking outcomes of forest management.

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1. Introduction

Since its development over 20 years ago, Forest Integrity Assessment [1](FIA) tool has been adapted and deployed as a biodiversity monitoring tool in temperate and tropical forests across more than 20 countries across 6 continents. It has supported small-scale foresters in meeting HCV requirements to achieve certification under the FSC forest management standard, oil palm plantation managers to manage HCV conservation set-asides, and forest communities to follow national forestry regulations. Many of these adaptations and deployments have been facilitated by HCVN Secretariat in collaboration with WWF field programmes.

However, the widespread use and uptake of FIA remains limited. The tool has demonstrated potential as a cost-effective, evidence-based approach to forest management and monitoring, and has the potential to enable forest managers and communities to improve forest management at scale. To realise this, it was necessary to identify technical issues through stakeholder feedback, such as data collection challenges and the need for adaptation to new regions and ecosystems. In addition, greater recognition of market drivers and future potential demand for participatory and accessible forest monitoring resources is needed.

To this end, HCVN and WWF conducted a series of discussions with FIA users – through online questionnaires and online workshops – to assess the tool's effectiveness, gather insights, and identify areas for improvement and development. This report distils the key findings and outlines a roadmap for future development.

2. Origin and aims of the FIA tool

Before developing an action plan to evolve the FIA tool, it is important to understand what it was originally designed to achieve.

Assessing and monitoring forest biodiversity is an integral component of responsible forest management, especially in natural forests. An understanding of the trends and dynamics of biodiversity in managed forests is important to:

- Inform sustainable forestry management operations by identifying areas that require protection or responsible management.
- Identify natural ecosystems areas that should not be cleared and prepared for new agricultural land use due to their high biodiversity values that support natural process and ecosystem services.

[1] The global FIA manual can be found here, and a FIA Briefing Note here

- From baseline values, inform managers of the changes in forest biodiversity over time.
- Reflect the effectiveness of responsible forest management.
- Help identify and prioritise areas for restoration activities.
- Inform and communicate the effectiveness of sustainable management to external stakeholders.
- Meet sustainability standards and legislation for protecting and restoring nature.

The FIA tool enables biodiversity monitoring in forests where non-experts – such as smallholders, communities and small- and medium-sized enterprises – often lack the capacity to conduct detailed species surveys or inventories.

The tool builds on the principle that most organisms depend on specific habitats and forest conditions, and that forests with a more complex structure and diversity of microhabitats tend to have a higher level of biodiversity.

The FIA tool uses a simple checklist of yes/ no questions about features seen along a transect. Questions are grouped into areas with a high correlation to biodiversity: Structure and Composition, Impacts and Threats, and Microhabitats. Each 'yes' answer adds to the FIA score. Lists of species seen can also be recorded, but they do not affect the score, as species identification can be biased by the observer's level of expertise. This methodology offers a scientifically robust proxy of forest biodiversity – providing an accessible, low-cost and practical alternative to complex species surveys and helping to ensure consistency in monitoring, regardless of the user's level of expertise.

Figure 1. Simplified schematic illustrating the correlation between forest with a high degree of complex structure reflecting a high Forest Integrity Assessment score and less complex forests or degraded forest ecosystems with a low score. Natural, minimally disturbed forests serve as reference points with a maximum score against which other forest stands, or conservation set-aside can be compared.

The tool can be adapted to different geographies and ecosystems and is suitable for both large forests and small remnant patches in agricultural or forestry landscapes. FIA can facilitate self-assessment of forest management practices, participatory monitoring, and company-led evaluations, requiring only basic training for consistent results. While less precise than detailed measurements, rapid estimates across many plots provide a reliable overview of forest conditions. The approach enables nearly anyone with an interest in forests to contribute to improved forest management and conservation of biodiversity.

FIA Checklists
Structure and Composition
Key areas assessed using the FIA methodology – • tree size and abundance, as large-diameter trees are strong indicators of biodiversity and naturalness, with multiple scoring thresholds; • evidence of regeneration such as sapling presence or presence of large fallen trees; • trees important for biodiversity that provide habitat for epiphytes, nesting animals, provide fruit, nectar, or a complex structural and niches; • dead wood, which plays a critical role in supporting many organisms and ecological process; • Other locally relevant features, such as mosses, lichens, hollow trees or anthills, tailored to reflect specific ecosystem characteristics.
Impacts and Threats
Human activities like logging, hunting, and agriculture impact forest health and biodiversity. The FIA tool adapts to local contexts to identify negative impacts such as valuable tree loss, invasive species, illegal wildlife exploitation, logging, land clearing and proximity to roads. Absence of common threats provides a positive FIA score as a reflection of naturalness of forests with higher expected biodiversity.
Focal Habitats
Forest habitats such as water bodies, slopes and open glades support diverse species and vital ecosystem functions, varying by forest ecosystem and geography. These habitats, scattered throughout forests, need special management and community awareness for effective protection. Focal habitats are chosen based on local ecological features and help set conservation priorities.
Focal Species
Focal species – often threatened animals or plants that help raise conservation awareness – are important. The FIA suggests choosing a few easily recognised species from different groups, focusing on those familiar to local communities. Observing these species, or signs of them, mainly helps engage people in protecting biodiversity. These observations are not used for scoring or as a replacement for detailed species surveys in the FIA checklist.

FIA checklists developed for specific geographies and forest types can be accessed from the HCV Network website.

3. FIA deployments and stakeholder feedback

The following insights were compiled from FIA users through responses to requests for information, targeted interviews and workshops (See Annex 1 for details on the review methodology).

Checklist components

Adaptations of FIA have not necessarily included all four checklist components – namely structure and composition, impacts and threats, focal habitats and focal species – during monitoring. The most frequently used checklist components were *structure and composition* and *focal species*. Even though inclusion of *focal species* generates incomplete and biased data, recognising and recording species continues to engage users and may encourage repeat monitoring. Checklists for *threats* were the third most included component, and focal habitats were the least used. More studies are needed to assess the necessity of each module and evaluate their ease of use, as this may influence the consistency of results. Improved understanding could support the development of standardised checklists that retain the most critical components for assessing forest integrity and enable more consistent monitoring outcomes.

Development context

FIA has primarily been used in both small- and large-scale production forestry but has also frequently been applied to conservation areas, protection forests and plantation set-asides, and has been successfully used by communities to monitor community forests. Recent adaptations of the methodology include calibrations with carbon stock, which show initial promise.

Deployment of FIA in Community Forests, Cameroon

The local Cameroonian NGO SAPED, supported by the Rainforest Alliance, applied the FIA checklist across multiple community forests in southern Cameroon, to enable greater community participation and ownership in making forest management decisions based on FIA data they collected. Community members recorded data on key biodiversity indicators, including vegetation structure, the presence of focal species, and anthropogenic threats.

FIA scores effectively distinguished between more and less degraded forests, while FIA data was shown to be sufficiently robust to generate an estimate of above-ground forest carbon stock. The process was rapid, cost-effective, allowed communities to determine actions and provided valuable baseline data for future monitoring by the community. Given the local capacity and paper-based version, communities will still need support to repeat the FIA surveys for monitoring.

Countries and ecosystems

FIA has been adapted in at least 20 countries, predominantly spearheaded by NGOs who have championed the FIA tool.

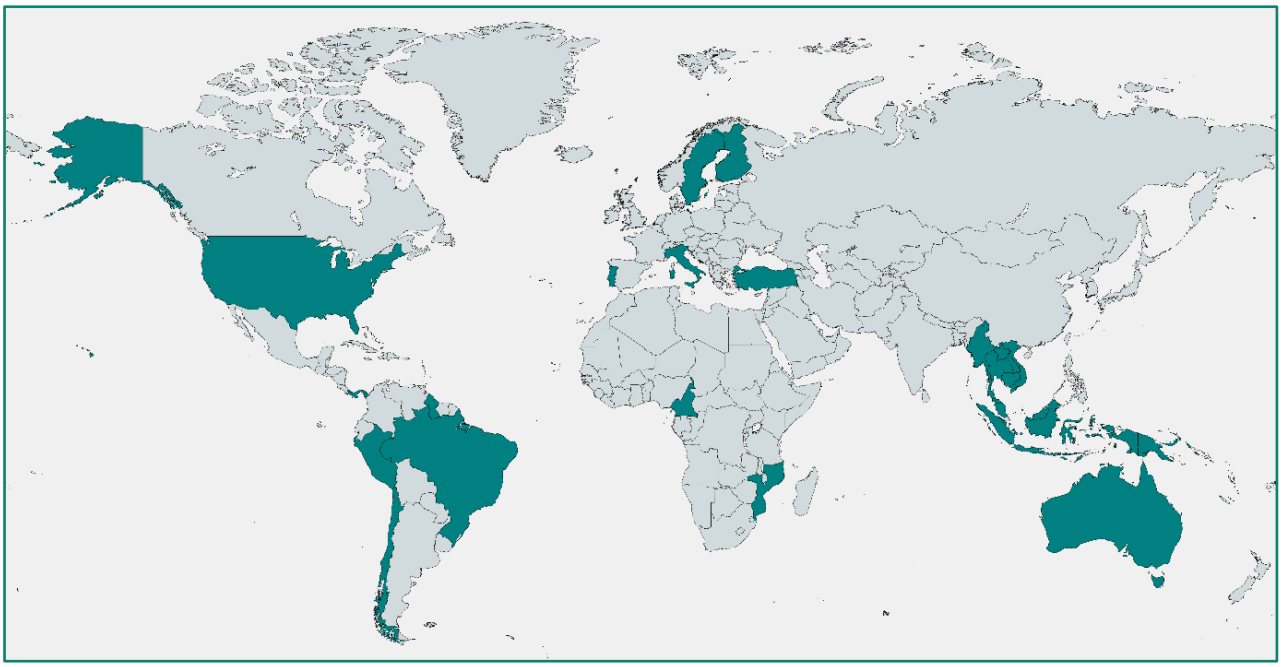


Figure 2. Countries where FIA has been adapted, tested or used: Sweden, Finland, Portugal, Italy, Türkiye, Cameroon, Mozambique, Thailand, Laos, Cambodia, Vietnam, Malaysia, Indonesia, Myanmar, Papua New Guinea. Australia. Peru, Chile, Brazil, Guyana, United States of America. Ecosystems where FIA has been applied include Atlantic Forests and Cerrado (Savanna) of Brazil, temperate forest ecosystems in Scandinavia, European broad-leaved forests, lowland wet tropical Rainforest ecosystems in Southeast Asia and Africa, dry and monsoonal forests and woodlands in Indochina, Africa, and Australia, montane tropical forest in Papua New Guinea and even in agroforestry and orchard ecosystems in Europe. There is huge potential for developing additional checklists in more countries and calibrating FIA to additional ecosystems that have not yet been covered. This was reflected in the survey, where over 75% of users had to develop their own resources.

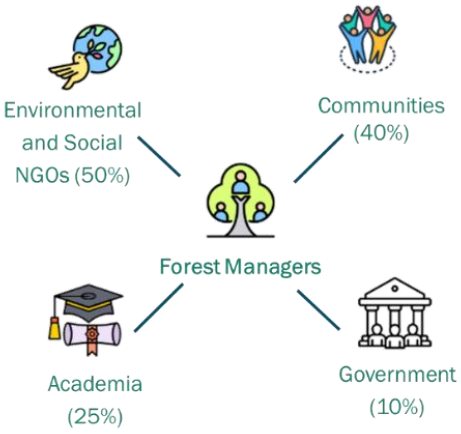
Methodology

The FIA manual recommends 100m transects – used as sampling units – within stratified forest blocks. The manual does not prescribe sampling intensity or a specific sample design within the forest but instead provides examples of good practice. As a result, generating useful monitoring results requires some prior understanding of sampling principles.

There was inconsistency among users in how sampling was applied – particularly in relation to sampling design (e.g. whether and how to stratify different forest stands such as secondary and primary forests), sampling intensity (with many applying a 'best fit' approach), and sampling frequency (whether monitoring was repeated or periodic). Users have called for clearer guidance on sampling intensity, design, and frequency to improve the reliability of FIA results in the field. However, any enhancements to sampling protocols should strike a balance between methodological rigour – for example, through recommended sampling design and intensity based on forest size – and the flexibility that makes FIA accessible and widely usable.

Target audience

While forest managers are the principal users of FIA, other frequently included stakeholders using FIA are environmental and social NGOs, communities, academia and government officials.



FIA is universally easy to teach and learn and is seen as an accessible tool usable by a wide range of stakeholders, especially communities. It also has the potential to engage non-foresters in improving monitoring practices in forestry management.

FIA is also well-suited for raising awareness and educating users – particularly communities – about threats and impacts on forest health. Results can be generated quickly, and improvements in FIA scores over time can foster a sense of pride in forest resources and motivate sustainable management. Any improvements to the tool must retain this core 'DNA' of accessibility, simplicity, and community engagement.

Impressions of FIA and areas for improvement

FIA users broadly agreed that FIA is a practical and accessible tool, highlighting that it is easy to train personnel in its methodology, straightforward to use in the field, and quick to implement. Many also noted that preparing for field use is simple for a wide range of users, and that the approach is highly cost-effective. FIA was consistently described as effective and capable of producing reliable results, with outputs that are easy to interpret and report. Overall, the feedback reflects strong user confidence in the tool's usability, efficiency, and accessibility.

Users highlighted several key areas where the FIA tool needs improvement. These are listed in a perceived order of preference (although this was not specifically polled during calls, the online surveys or round table)

- Digitising and improving access to the FIA tool - preferably through an offline-capable mobile app - to replace the current paper-based data collection process that is challenging in remote forest environments, and including effective technology for recording levels of forest biodiversity and data analysis, storage and reporting.
- Increased availability of FIA forms for different forest ecosystems on the HCVN website.
- Clearer, simplified guidance on overall FIA methodology including:
  - Improved guidance on interpreting results to inform forest management;
  - Specific instructions for sampling and forest stratification;

  - Enhanced guidance on identifying threats; and
  - Verification of self-assessments.
- Improved guidance for documenting ecosystem services, particularly social and cultural aspects of HCVs.

4. FIA development needs

Key areas for FIA improvements were identified from feedback obtained from questionnaires, targeted interviews and workshops with FIA users and interested HCV stakeholders. Areas for improvement are grouped into i) technical improvements of the tool, and ii) enabling conditions, levers and drivers to promote uptake of FIA.

4.1. Technical improvements

Technical improvements were generalised into the following key areas of need:

- Digitising the tool to enhance usability, data accuracy, and analysis
- Adapting the tool for new ecosystems and geographies
- Creating a centralised resource for FIA to house manuals, checklists, training materials and scientific evidence; and
- Integrating ecosystem service and cultural values to align with broader forest management and community needs.

Digitisation of the FIA tool

Until now, almost all applications of FIA are manually recorded in the field using pen and paper and transferred to permanent media, such as spreadsheets, later in the office. This presents implementation challenges for FIA monitoring in data collection and transfer especially in wet weather conditions, and analysis and presentation of FIA results to assist in management decision-making.

Migration to digital platforms – from simple digital forms or spreadsheets to interactive mobile applications and dashboards – will enhance the FIA implementation experience, improve speed of recording and reduce calculation errors in FIA results. Advances in smartphone technology allow applications to streamline permanent data recording on central or remote servers, improve reporting with built-in interpretation of changing patterns in FIA scores in each forest block, alert forest managers for improved management options and make the tool more accessible and user-friendly for local communities. A digital platform would also make data aggregation across sites or programmes or within landscapes for measuring performance and reporting more efficient.

Application of digital maps through smartphone GPS location services can be used for planning monitoring and to provide accurate FIA mapping of sample locations when monitoring in the field. Additional functions of photographic documentation taken during FIA transects can further validate monitoring results. Sound recordings can also be taken during FIA transects and have the potential to validate biodiversity and threat and impact patterns at a later stage if data reference points have been collected.

Checklist adaptation

Ongoing efforts to adapt the FIA tool for different forest types – such as montane and wetland forests within the same landscape – and for countries that do not yet have FIA resources or checklists represent the second development priority. Expanding the tool's applicability to non-forest ecosystems, such as grasslands, was also requested by users, but will require further research and field testing.

Development of a FIA Resource Hub

For users of FIA, the advantages of the tool are clear – a cost-effective, scientifically robust, and easy to teach, learn and implement tool for monitoring the condition and biodiversity of forests. However, disseminating information about FIA is a challenge that is compounded by the relative scarcity of resources on the HCVN website and other online sources. There is an urgent need to centralise resources in easily accessible locations such as the HCVN and WWF websites with links to:

- New and existing scientific studies and literature that demonstrate robust correlation between forest complexity (structure, composition, micro-habitats) and forest biodiversity.
- An updated FIA Manual drawing from over two decades of implementation experience in over 20 countries. Aspects for improvement include FIA sampling (design and stratification, intensity, frequency), FIA checklist adaptation procedure for new regions and ecosystems, and analysis of FIA results that inform appropriate management responses.
- An online repository of checklists developed and implemented in different geographies and ecosystems.
- Visual guidance and training tutorials to build local capacity and ensure effective use of the tool. Priorities are for videos and training presentations to demonstrate step-by-step processes for preparation – including robust sampling protocols, FIA implementation in the field, and interpretation of results to formulate actions to improve forest biodiversity.
- Case studies to illustrate the application of FIA in practice and encourage exchange between programmes.

Integration of social and ecosystem values

Some users voiced interest for incorporating ecosystem services, social or cultural values (HCVs 4–6) into a FIA-like tool that could be used in parallel with a conventional FIA, to achieve a more holistic forest and HCV monitoring approach. This may be most suitable for communities that wish to preserve their forests for the benefits that they provide, and document internal or external impacts in a simple and understandable format for advocacy and campaign efforts.

Some FIA adaptations have been developed for natural forest timber concessions and conservation set-asides in Papua, Indonesia, where relationships between community resources and forest biodiversity have been recorded. In these cases, FIA was used alongside social HCV indicators, enabling companies to assess the impact of their operations on community values. However, further fieldwork is needed to better understand the links between species and ecosystem biodiversity – as approximated through FIA – and the levels of provisioning, regulating, and cultural ecosystem services experienced by communities.

4.2. Enabling conditions, levers and drivers for wider FIA implementation

Improving enabling conditions, levers and drivers that promote and demand wider FIA use were generalised into:

1. Strategic alignment
2. Adoption and mainstreaming

Strategic alignment

For FIA to be adopted more widely, increased awareness and understanding of the benefits of using the tool are needed among potential users. Published research studies from Malaysia and Sweden that evaluate FIA (or earlier versions of FIA that are still being deployed) can now be accessed from the HCVN FIA webpage. Additional studies or analyses focused on the scientific rigour of FIA are needed to demonstrate its relevance and accuracy across diverse ecological and geographic contexts. With this information, FIA can be aligned with other tools and initiatives.

Users of the High Carbon Stock Approach (HCSA) - such as those involved in RSPO certification and climate initiatives - could also potentially benefit from the use of adapted FIA methodology, particularly those focused on forest structure and composition, to support routine monitoring of forest carbon sequestration or restoration. Indeed RSPO has developed and is piloting a simplified FIA procedure for Independent Smallholder producers to identify natural forests that must not be cleared. Aligning FIA with HCSA and climate initiatives presents opportunities for regular monitoring and for demonstrating improvements or maintenance of forest condition, potentially reducing reliance on detailed and costly

forest inventories. While a handful of studies have been conducted, further documentation is needed on the rigour of FIA approaches in estimating carbon stored in forests.

The FIA tool can complement the Science Based Targets Network (SBTN) framework by providing a field-based, participatory method for biodiversity assessment at a level of resolution suitable for land-use impact assessment. In Step 5 – Track of the SBTN framework, FIA is particularly relevant for continuous monitoring to ensure progress towards location-specific targets on ecological integrity that a company sets. FIA's checklist approach aligns with SBTN's aim to provide indicators and metrics that are interpretable and actionable for companies. FIA could potentially serve as an ecosystem condition metric within the State indicator element of SBTN's framework, subject to a locally-adapted FIA procedure being available for given high-biodiversity locations.

FIA could also support biodiversity credit schemes by offering field-based data that complements habitat and species models, particularly if paired with observer verification systems and comparative research between localised FIA procedures and other recognised biodiversity methodologies. Biodiversity Impact Credits (BICs), for example, quantify projected changes in species survival probabilities and rely on empirical biodiversity measurements. By documenting structural and compositional integrity through repeated FIA assessments, communities and land managers could generate verifiable biodiversity data to feed into credit calculations. Using the FIA structure and approach in biodiversity credit frameworks could enhance transparency and community participation – filling a current gap in many biodiversity markets that tend to emphasise habitat extent and modelled ecological condition over direct field-based observations.

Furthermore, the HCV Network should more clearly articulate and communicate how the FIA tool fits within the High Conservation Value methodological framework. Currently the FIA tool is not included or explained or recommended as a methodology relevant to the identification, management and monitoring or HCVs, in any of the HCV Common Guidance or manual documents.

Adoption and mainstreaming

As evidence of FIA's uses and benefits continues to grow, the tool shows strong potential for widespread adoption across sustainability standards, financial institutions and national forest assessment schemes or programmes. While specific tools such as FIA are generally not stipulated within the formal principles and criteria of sustainability standards, they can be referenced in guidance materials and showcased through case studies to demonstrate effective implementation. FIA is already recommended in guidance materials regarding RSPO's Independent Smallholder Standard and FSC's Forest Management and Ecosystem Services Procedure, and is listed on the TNFD Tools Catalogue. HCV Network members who have used FIA, along with other organisations supporting its uptake, can advocate for FIA use at voluntary sustainability standard general assemblies, annual meetings and roundtables, as a

recommended method to foster more enthusiasm for cost-effective monitoring and for demonstrating positive conservation outcomes in forest management.

The relevance of measuring ecosystem condition for the private sector

Both regulatory and voluntary frameworks and standards aimed at nature positive outcomes have been evolving significantly in recent years, to improve action, transparency, and accountability of private business and finance sectors to manage biodiversity. Examples include CSRD and related ESRS, TNFD, SBTN, GRI, World Benchmark Alliance Standards, and Accountability Framework Initiative. The Global Biodiversity Framework provides the over-arching structure, from which there is increasing alignment amongst these standard and frameworks on the most globally applicable and relevant indicators and metrics.

The Nature Positive Initiative has conducted a comprehensive review of the State of Nature indicators and metrics applicable for corporate biodiversity accounting. Ecosystem conditions, and change in ecosystem conditions, have emerged as a universally applicable nature metric and indicator. Thus, ecosystem conditions are included as a disclosure metric into recently published guidance of TNFD and GRI Biodiversity standard, where biodiversity is a material topic.

This makes FIA highly relevant as a field-based methodology for measuring and reporting on the status and change of ecosystem condition—particularly in cases where an organisation operates in or near sensitive ecosystems, such as High Conservation Value areas or Key Biodiversity Areas. These locations require granular, verifiable, site-level data to assess current condition and demonstrate avoided impacts. The Align project, funded by the European Commission, which has co-developed recommendations for a standard on corporate biodiversity measurement and valuation, explicitly acknowledges this need and recognises FIA as a field-based methodology in its briefing note, *Measuring Ecosystem Condition – A Primer for Business*.[2]

As adoption and alignment of nature-related frameworks and standards accelerates across the private business and finance sectors, FIA is well placed to support commodity certification schemes that are shifting toward outcome-based compliance. It also holds broader applicability for companies seeking to assess and manage biodiversity risk in high-impact areas.

FIA also presents opportunities within the financial sector for practical corporate due diligence before investing in development or programmes, especially if more closely involved for example by setting up transition finance for forest product related business to undertake specific sustainability measures. As financial institutions begin integrating nature-related risk frameworks - such as TNFD, EU Sustainable Finance Disclosure Regulation (SFDR), the HCV Approach and emerging biodiversity credit markets - there is growing demand for credible, field-based data to measure change in ecosystem condition. While safeguarding forests and their integrity is still not widespread in mainstream finance, FIA can provide consistent, evidence-based insights into the ecological impacts of investments, particularly in forest-linked supply chains or land-use projects. This makes it a potentially valuable tool for both pre-

[2] https://capitalscoalition.org/wp-content/uploads/2023/10/Align_eco_condition_primer.pdf

investment screening and post-investment monitoring, especially when applied by local actors or communities.

In the context of FSC, FIA already demonstrates strong alignment with the system's standards and procedures. It has been applied across Small and Low Intensity Managed Forests (SLIMFs), natural forests, plantations, conservation set-asides, and in the future could be deployed by organisations establishing restoration priorities. FIA offers credible, and repeatable data on forest condition, and is particularly well-suited for community participation, capacity-building, and adaptive management. Comparatively, it can be lower in cost than deployment of traditional biodiversity monitoring methods, while still allowing for the detection of certain changes in state and pressures over relevant spatio-temporal scales. Within FSC's Verified Impact procedures, FIA is a recommended methodology in the FSC Guidance for demonstrating Ecosystem Services, and can support demonstration of net-positive impacts on several of the Ecosystem Services categories. As a modular tool, FIA complements FSC's normative standards while allowing national-level adaptations through mechanisms such as National Forest Stewardship Standards (NFSS) and the Regional Smallholder Standards.

5. FIA action plan

The table below describes the short- (2025), medium- (2026-2027), and long-term (2028-2030) actions required to further evolve FIA as outlined in the previous section. Implementation of these actions will depend on HCVN securing the necessary funding from interested stakeholders and supporters.

**Short Term is 2025. Medium Term is 2026-2027. Long Term is 2028-2030.*	**Short***	**Medium***	**Long***
• Develop tech-based platform for FIA collection, analysis and reporting			
• Develop central server for global FIA generated data storage and voluntary reporting			
• Develop different subscription models for premium features, services, and data storage that take into account equitable benefit sharing and data ownership			
• Adapt FIA and calibrate for additional ecosystems and geographies			
• Host FIA resources on HCVN website	*Being developed under current review*		
• Complete repository of existing resources			
• Develop map with search function for available resources incl. links to 3rd party resources			

Short Term is 2025. Medium Term is 2026-2027. Long Term is 2028-2030.	Short*	Medium*	Long*
• Link scientific studies reviewing the use of FIA that provide assessment of effectiveness and rigour of FIA			
• Call for research on FIA effectiveness and rigour in regions where FIA is more frequently used by research institutions			
• Update the global FIA Manual to address identified areas that lack of clarity e.g. stratification, sampling intensity and frequency etc			
• Develop and disseminate improved training and support materials			
• Suitability study for incorporation of social HCVs into FIA			
• Design of social HCV FIA tool (*if suitable*)			*If applicable*
• Develop case studies demonstrating scientific rigour of FIA in different geographies and forest ecosystems.			
• Develop briefs of potential uses of and benefits to voluntary sustainability standards, corporate due diligence, and national forest monitoring schemes.			
• Revise HCVN's Common Guidance for Management and Monitoring.			
• Advocate for FIA adoption with voluntary sustainability standards as potential accessible tool for demonstrating HCV and high carbon stock (HCS) protection and certification compliance.			
• Advocate for FIA adoption with climate action, biodiversity credit, and restoration and remediation schemes to demonstrate progress and contribution to global goals.			

6. Conclusion

The FIA tool is considered by users to be a practical, inclusive, and scientifically credible method for monitoring forest biodiversity and ecosystem condition. With over two decades of application, strong user confidence, and alignment with emerging policy and market demands, FIA is well-positioned for broader adoption. By implementing the actions proposed in this report – focused on digitisation, checklist expansion, knowledge sharing, and integration of social values – HCVN and its partners can help unlock FIA's full potential as a cornerstone of participatory, scalable forest monitoring worldwide.

Annex 1 Methodology for the review

The FIA review and roadmap for priority improvements was developed from available literature and through soliciting insights and inputs from individuals and organisations who have used FIA, and/or can promote and benefit from an improved and more accessible version or format of FIA.

The main objectives of engagement were to determine:

- The contexts and manner in which FIA has been used;
- The successes and challenges in its use;
- Recommendations on how FIA should be improved; and
- Emerging policy levers and applications of FIA for biodiversity accounting.

To acquire as broad and comprehensive feedback as possible from current and potential users of FIA, we used a range of approaches to engage practitioners, academics, and managers from conservation NGOs, research institutions, forestry and supply chain companies and voluntary sustainability schemes. This included an online questionnaire, one-to-one interviews, and two online expert workshops.

We compiled a list of FIA adaptations, uses and contact people, based on online research and past projects and reports known by the HCVN Secretariat and WWF-Netherlands.

We developed a 15-minute online questionnaire, targeted to current and past FIA users. The purpose was to make it quick and easy for individuals to provide a) detailed information on the use of FIA; and b) feedback on strengths and improvements.

The questionnaire was circulated directly by email to individuals on the contact list, through the HCV Network monthly newsletter and through a LinkedIn post.

The literature on FIA highlights it as a rapid, low-cost and scientifically robust method for assessing forest condition. However, peer-reviewed studies are limited. Suggitt et al. (2021)[3] reported strong correlations between FIA scores and independent ecological indicators – validating its use as a proxy for biodiversity in Southeast Asian tropical forests. However, Wang et al. (2025)[4] noted that the FIA procedure must be adapted to specific contexts, having observed no correlation between FIA scores and forest condition in plantations when using a FIA checklist developed for natural forests in a different geographic region. Nevertheless, the tool is highly adaptable and accessible, making it particularly valuable for community-based monitoring, conservation planning, and certification processes.

[3] Suggitt, AJ, Yeong, KL, Lindhe, A et al. (5 more authors). *Testing the effectiveness of the forest integrity assessment: A field-based tool for* estimating the condition of tropical forest. Ecological Solutions and Evidence, 2 (2). e12067. ISSN 2688-8319

[4] Wang CJ, Deng DZ, Yan WX, Gao ZW, Huang SF, Wan JZ (2025). Application of Forest Integrity Assessment to Determine Community Diversity in Plantation Forests Managed Under Carbon Sequestration Projects in the Western Qinba Mountains, China. Land, 14(4), 798; https://doi.org/10.3390/land14040798

Over a three-month period (early March to end May 2025), a total of 15 responses were received. This may appear low; however, they represent applications in ten countries – around half of all known countries where FIA has been adapted. The results of the questionnaire were compiled and analysed to generate initial insights into strengths, weaknesses, opportunities and recommendations for FIA improvement.

Early-stage one-to-one interviews were conducted to explore the evolution of FIA in greater depth, with a focus on specific use cases in Swedish forestry, which has the longest history of using an early version of the tool, Nature Value Assessment (NVA), for forestry planning including to identify set-aside areas due to habitat integrity. Interviewees included:

- **Mr Anders Linde** – Independent expert who developed the original Nature Value Assessment (NVA) and played a key role in its evolution into FIA and its global application; he also highlighted areas for further improvement.
- **Svenska Cellulosa Aktiebolaget (SCA)** - A major forest industry company in Sweden, primarily focused on timber, pulp and paper production. SCA is Europe's largest private landowner and manages over 2.7 million hectares.
- **Södra** – Sweden's largest forest-owner association with more than 50,000 family forest owner members producing raw forest materials.

Online expert roundtable workshops were organised in May 2025 to gather input on emerging applications and potential technical improvements to FIA. Individuals from civil society, service providers, voluntary sustainability schemes (VSS) and the private sector were directly contacted and invited to participate in one of two scheduled 1.5-hour workshops. Pre-reads were shared with participants, providing essential background on the review's objectives, current FIA applications, and early insights gathered from both the online questionnaire and one-to-one interviews.

During the workshops, two guest speakers shared recent and novel FIA applications that many participants may not have been familiar with. Gervais Nsibeuweula of SAPED discussed the use of FIA with local communities in southern Cameroon to support biodiversity and carbon stock assessments within community forestry plans. Glen Reynolds of SEARRP presented evidence on the robustness of FIA based on research conducted in the dipterocarp forests of Malaysia, as well as a dedicated FIA app and dashboard developed for that context. The workshop slide deck can be provided on request.

These sessions were used to gather feedback and recommendations from participants on technical improvements to FIA, potential future applications, and policy levers that could support its wider adoption. Over 60 individuals registered interest in the meetings, with 42 participants attending from the following organisations:

NGOs	Private sector	Technical organisations	VSS
• WWF • FPP • WCS • GPSNR • SEARRP • Flora & Fauna international • Istituto per le piante da legno e l'ambiente	• Södra • IKEA • Sinar Mas • Lestari Capital • Olam	• Ekologika • Preferred by Nature • Proforest • Dassa Corp • Gaia Eko Daya Buana • Hollow Wood	• RSPO • FSC • Better Cotton

To ensure that prioritised improvements to FIA are grounded in practical realities, calls were held with several digital environmental consultants and developers – Poket, Freaklabs and Baker – to better understand the limitations of emerging technologies and identify technical specifications suited to an enhanced version of FIA that embraces digital tools while retaining accessibility and usability.