

Malawi Macadamia Industry Roadmap

To lead the industry, reconstituting the TNGA under a revised constitution, inclusive of all industry stakeholders. Enhance capacity to engage and support members to innovate, enhance quality, productivity, and overall competitiveness of the Malawian macadamia industry.

September 2021

For Consideration at the TNGA Meeting 1st October 2021

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Executive Summary

TNGA is in a transition phase with a renewed mandate and adopting a more inclusive membership structure. This roadmap will help define the purpose of the TNGA over the next 5 years, identify the milestones required to achieve it and set out key objectives and activities. Consultations over the last 18 months have defined a clear agenda and identified focus areas for the TNGA. This roadmap will order activities and provide an operational framework thereby acting as a bridge between the top-level agenda and implementation plan.

This road map lays out a pathway to increase the provision of industry wide services to all stakeholders and a financial model independent of external support. The industry is changing profoundly with the centre of gravity moving gradually further north each year, more diverse business models and farming systems. The industry is becoming less vertically integrated, several factories now process nut from other farms and some NIS is exported for processing in South Africa. As the community grows to include more farms of different scales in new areas it becomes increasingly important and valuable for an industry body to represent these different perspectives and address their needs.

Throughout the process to develop this road map there has been a clear desire for the organization to remain independent and not become dependent on external resources to sustain activities. Nor does it desire to become a burden and create an economic drag for the industry, with significantly lower fees than other origins. As a result the plan has produced a small, lean structure with modest ambitions but focused on areas which can have a significant impact. Through keeping the organizations agenda focused on priorities that can have a tangible positive impact on the productivity, quality and sustainability at farm level benefiting members. This will be complemented by increasing the capacity of the organization to represent the needs of the industry both within Malawi and externally. As the industry grows and becomes a more significant component of the Malawian economy this will become increasingly important to ensure a good operating environment is maintained.

The starting point of the road plan is a long standing organisation with a strong desire to become more active and to serve the needs of the industry. In its recent history the main activity of collecting industry statistics will be drastically expanded. The activities proposed will be aided by the establishment of a small secretariat to conduct day to day business and release voluntary positions from administrative functions. The scaling up of activities in several areas many of which are front loaded to get in place. These services will be important in defining the new role of the organisation, and demonstrate its value to the industry.

The election in 2020 of a new chairman also saw for the first time committee positions for regional as well as for factories and smaller growers. This is a clear message of intent to broaden participation and address the changes of large and small growers alike. The new committee pursuing the ethos of this road map has used the platform the TNGA provide to engage several external partners to support key early elements that need to be in place.

The author would like to acknowledge the work of the TNGA committee, whose frequent discussions, feedback and ideas have been essential to develop this road map. This work has been supported by the EU/GIZ KULIMA MIERA program.

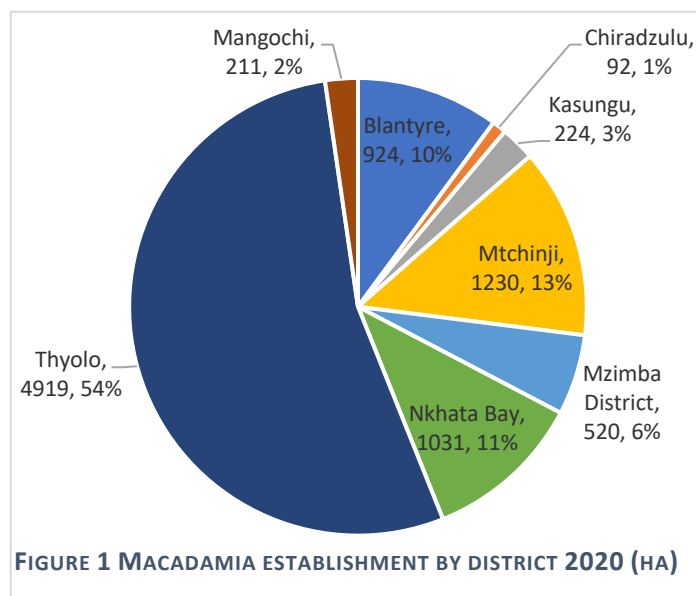
Aim for next 5 years:

To lead the industry, reconstituting the TNGA under a revised constitution, inclusive of all industry stakeholders. Enhance capacity to engage and support members to innovate, enhance quality, productivity, and overall competitiveness of the Malawian macadamia industry.

Context of the Roadmap:

Malawi is currently the seventh largest producer of macadamia in the world exporting 1,500 MT of kernel valued at \$23 million in 2021. The industry is projected to grow by 46% by the end of 2026 to 15,000 ha, and for export earnings to exceed \$40 million current pricing trends are sustained. An additional 1000 ha of capacity is being added annually this rate will be sustained over the next 5 years 'baking in' long term growth. Malawi has a good reputation on the global market as a high-quality raw macadamia kernel supplier. Global production is growing, and Malawi must maintain and enhance its established reputation and productivity to remain competitive in the medium term.

The TNGA established 40 years ago to represent Malawian tree crop growers has become less active and principally focused on collecting industry statistics. Consultations conducted in 2020 identified a strong desire for the body to become more active to address the needs of members and coordinate industry wide issues. Macadamia is the only tree nut crop produced by members, which justifies revising the mandate to focus solely on macadamia. Elections in 2020 initiated the process to revise the constitution, introduce more inclusive representation of member diversity and identify a sustainable financing mechanism. This institutional transition expanded the number of positions to include regional representatives, smaller growers, as well as factories. Greater geographical representation of board members alongside Covid related restrictions on gatherings and travel, has led to adopting remote working practices to conduct business.



The distribution of the industry is changing with an increasing proportion of plantings taking place outside of the southern region. Over the next 5 years the central and northern region are likely to account for over 60% of the industry by area (Figure 1). The economic impact of the crop will be spread more evenly across the country.

Hitherto the TNGA has not adopted fee structures to raise the resources required to conduct activities beyond statutory obligations to report industry statistics. Malawian growers have not contributed to an industry body previously, unlike Australia

and South Africa growers where statutory levies on NIS are in place. Funds are used to invest in marketing and innovative areas of R&D, efforts are being made globally to equitably distribute the costs of marketing

initiates which benefit all origins through the establishment of the World Macadamia Association (WMA). Malawi does not have the scale to replicate these structures but can benefit through linkages with other industry bodies on technical issues and participation in marketing initiatives.

The growth of the Malawian industry is principally driven by the erosion of margins on traditional cash crops, such as coffee, tobacco and latterly tea, and the drive to identify a suitable long-term substitute. Extensive areas of the country are highly suitable for macadamia cultivation (57% by area) which has until now has mainly been exploited in the southern highlands. The central and Northern Regions represent 83% of the suitable area and have great potential for further growth, building upon an existing successful export industry. New entrants are establishing farms outside traditional production zones and adopting new systems of production at higher density, commonly using a different varietal mix and utilizing irrigation. This poses new technical challenges which need to be addressed and requires the transfer of capacity to maintain productivity, quality into the future.

Organized theft of nut in shell (NIS) from estates for export and local sale in some areas is reported to reach up to 30% of production. Illegal nut in shell markets drive demand supplied by dense populations in key production areas, and high rates of poverty combine with the hunger season incentivize theft. Crop losses and rising security costs create a significant economic drag and have a noticeable impact undermining competitiveness of the industry. Unlike other origins in the region there is no legislation or regulation which covers this trade, leading to the establishment of enterprises, who trade and export produce without registration, export certification and the requisite compliance with food safety standards. Unregulated export of low-quality NIS has materially undermined quality in other origins thus poses a reputational threat to the industry.

There are an estimated 5,000 smallholder macadamia farmers organised into 4 regionally based farmer organisations. Small volumes have successfully entered processing facilities for over a decade at acceptable quality demonstrating the viability of smallholder production. The crop has been prioritised by the donor community and has recognised potential as an export diversification crop which can benefit

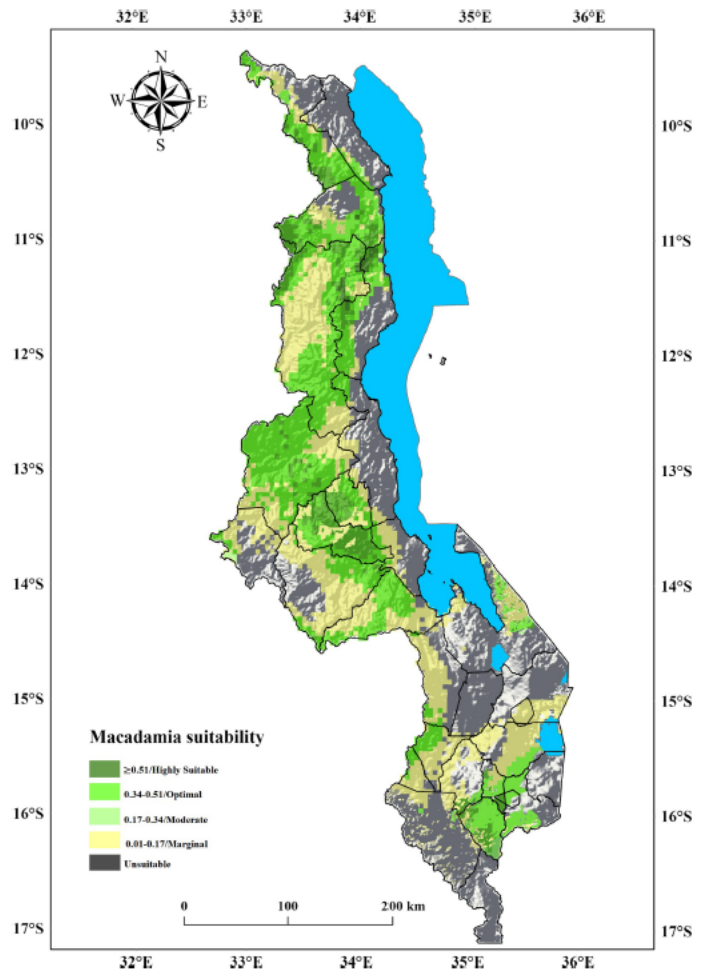


FIGURE 2 CURRENT SUITABILITY OF MACADAMIA IN MALAWI (E.ZUZA 2021)

smallholders. Building volumes further will require greater collaboration to define standards and transfer technical capacities. Integration of smallholders and small farms poses challenges around ability to verify statistical data, diverse farming systems. Recent initiatives on nutrition and varietal performance provide a starting point to explore more meaningful collaborations and establish a smallholder position within the TNGA.

Future Vision

Industry consultations over the last 18 months have provided the basis to define the role of the organisation and prioritise the services it offers. This process has provided momentum to start revising the constitution and put in place a new fee structure to provide resources. These developments will enable the organisation to implement activities to achieve its overall goal through:

- Provide the leadership and innovative environment required to enhance the competitiveness, growth and sustainability of the Malawian macadamia industry.
- Maintain and enhance the reputation of Malawi as an origin of premium Macadamia products by participating in the World Macadamia Association on marketing activities.
- Be inclusive to all in the industry irrespective of scale, location of operations though increasing the committee posts to represent all interests and perspectives.
- Support good agricultural and climate smart agricultural practices, enhance the Malawian environment. Through providing a platform for the industry to interact internally and externally to share knowledge, pool expertise and access technical materials.
- Through monitoring and collecting statistical data with members, develop data resources that inform agronomic and commercial decision making. This will provide a production and market information system focused on identifying current issues and addressing future challenges.
- Contribute to the economic development of Malawi by generating export revenue, value adding to primary produce, generating sustainable skilled employment opportunities. Providing an access point for smallholders to access premium markets.
- Collaborate with public institutions to put in place rules that establish origin and provide certificate of authenticity to all macadamia products irrespective of market. Lobby on behalf of the industry to strengthen legislative support and address threats posed to the industry.

The next 5 years: Industry Projections

The industry is in a growth phase; establishments have averaged over 1000 ha in the past 5 years and 2020 saw the largest ever annual planting of seedlings at 1,473 ha. Planting projections by members support a continuation of this trend with overall ha reaching 15,000 ha a rise of 46% by 2026. NIS production is projected to increase by 45% surpassing 10,000 MT with the production capacity to achieve this is already locked in. It can be said that with high confidence that the industry will see sustain growth in NIS volumes and Kernel exports for the next decade. Investment in capacity will be important to sustain standards, maintain quality and productivity. This growth will also see macadamia become a more significant component of the export economy, create new skilled jobs.

Sellable kernel recovery (SKR) the key indicator of quality has averaged 26.5% over the industry in the last 5 years but varies considerably between producers (18-32%) and is lower than other origins. This suggests that productivity can be enhanced both by transferring knowledge between Malawian farms and

integrating innovative practices utilised externally. Stinkbug is responsible for a significant proportion of unsound kernel, with fewer control options available, new approaches to control this priority pest will need to be widely adopted to enhance sellable kernel recovery industry wide.



FIGURE 3 MALAWI MACADAMIA INDUSTRY NIS (1.5% MC) WITH SELLABLE KERNEL % 2009-2020 ACTUAL DATA PROJECTED TO 2026

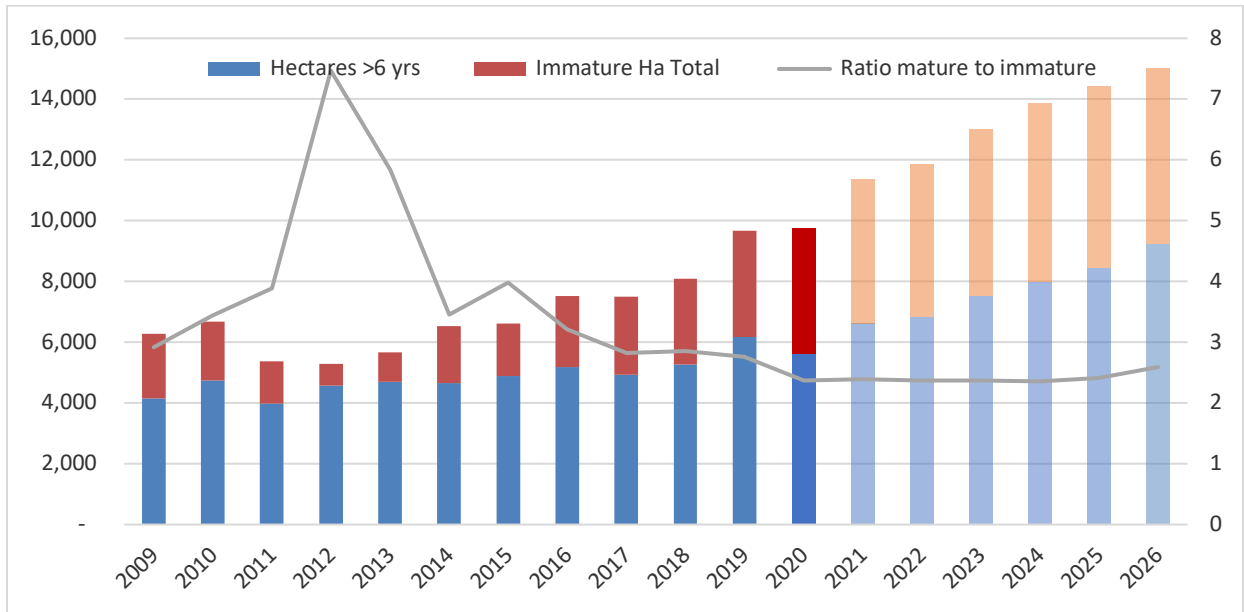


FIGURE 4 MALAWI MACADAMIA INDUSTRY HA IMMATURE & MATURE WITH RATIO OF IMMATURE TO MATURE TREES 2009-2020 ACTUAL DATA PROJECTED TO 2026

What can be achieved in the next 5 years?

Consultations to identify industry priorities coalesced around two main areas of activity. The first focuses on capacity both institutionally and on behalf of members alongside improving the quality and range of services available to all macadamia stakeholders. The second area is more outward looking forming linkages with other origins to benefit from research, interacting with the Malawian Government in areas of regulation, customs focused forming. The following section outlines in detail the key activities to deliver this agenda.

Institutional Capacity & Member Services

Strengthen Institutional Mandate & Financial Resources of the TNGA

The revision and updating of the constitution will be ready for approval by members at a meeting in September 2021. This will provide a mandate to the board to implement revised membership and fee structure. This is an essential step to put the organisation on a sound and sustainable financial footing to conduct activities and join international bodies. The revised membership classes would be inclusive of producers, processors, farmer organisations and enable associates those with an interest in the industry to interact and participate.

The work of the TNGA position holders is voluntary many of whom are responsible for significant farming operations and have managerial responsibilities. With growing complexity and time requirement the hiring of a fulltime staff member to cover administrative needs, handle communications and administration. This would overcome time constraints faced by post holders which has constrained activity in the past. This secretariat would be compact and office space would be provided by a member.

Communications & Membership engagement: Digitisation of Key Processes & Launch of Website

Establishment of a website to act as a point of information and contact to the industry in Malawi. To clearly articulate and communicate the status and goals of the industry. This would also house a repository of technical documents to enable members and interested parties to access information. Membership classes would have different levels of permission to access technical resources, industry statistics and contacts.

Establishment of a modest management information system

- Registering members, hold the directory of members, calculate and manage fees based on statistics and membership type
- Digitise submission of statistics, hold industry statistics and produce reports on productivity and quality
- Dashboards to manage membership, communications and monitor the status of the industry
- Produce verifiable certificates of origin
- Inventory map of the industry with locations of establishments, use of GIS to overlay climatic, and geographic data.

Public Sector Engagement

There are a number of priority areas, that can benefit from interaction with public institutions; particularly law enforcement, trade and customs issues. To address rules of origin, export certification

will require engagement over an extended period of time. The TNGA could develop a point of contact within key ministries invite to appropriate functions. Likewise the TNGA through a secretariat would be better able to interact with institutions and develop linkages. Without a secretariat structure this type of interact will be more challenging.

Technical Support & Capacity Development

Production systems in Malawi rely heavily upon research and development conducted in Australia and South Africa. The majority of technical innovations are identified and adapted 'in house' there has been no formal system to make technical information more widely available. The TNGA organised field days to showcase equipment and good practice alongside technical seminars however these have been driven largely by individual initiatives by a few industry actors.

Priority themes have been identified through consultation with members including stinkbug control, nutrition, irrigation, climate and varietal performance to provide better structure to technical events. The proposal is to arrange field days 2-3 times a year potentially in collaboration with service providers and technical seminars from experts in particular fields. These will have the most impact if practical, raising awareness of new techniques in a transferable format that strengthens good practice at farm level.

A twinning program with SAMAC would contribute to gaining greater access to a major R&D program and enable adaption of findings into the Malawian context. Using the website as a conduit to build up a repository of relevant research, would provide greater access for technicians. In addition, ensuring standard compliance through ensuring producers are aware of allowed agrichemicals and pesticides what these are and how to apply them. This can be facilitated by strong partnerships with agro-dealers and chemical suppliers, to disseminated information on available chemistry, nutritional products and pest control products. To ensure that good agricultural practice is implemented, including the consideration of social issues, and the health and safety of employees and the surrounding communities.

The development of knowledge products available digitally which are updatable, widely available and can help to standardise some information. A Malawi macadamia manual that could be developed on-line and updated as and when new information becomes available. A mobile based field guide to assist macadamia producers to identify pests, nutritional disorders and diseases and outline control measures. These initiatives could be developed in collaboration between experienced industry players and agro-suppliers so that information relevant to Malawi actionable.

The growth of the sector will create 1000's of new jobs may of which require knowledge and technical skills. The establishment of vocational or competency-based courses to provide a foundation in macadamia and develop the next generation of pest scouters will address potential skill gap.

Integration of Medium Sized farms

The current membership of the TNGA is 17; which represent all the estates and smaller farms with strong ties to estates or factories. There are an estimated 25-30 farms under 50ha largely established by wealthy Malawians, which could benefit from interaction with the established industry. This group have been neglected, too large for smallholder initiatives and too small or remote to be part of the main industry. There is significant potential to raise standards on these farms through greater technical exchanges and

bring their landholdings into the statistics. Farm holdings of this size also generate economies of scale in smallholder areas, provide rural employment and take advantage of some of the most suitable production areas. Farms over 10ha would have the right to be a member verified by a site visit potentially by regional representatives or satellite image. An initiative to record these holdings, identify specific needs and encourage membership would be an opportunity to expand membership to be more inclusive of all farms. There is a high probability that this group will expand further with many idle or farms looking for alternatives to tobacco.

Linking these growers to commercial nurseries so not to strain the limited capacity in the smallholder sector and programs to develop on farm capacity will be important of the potential of this segment of the industry is to thrive. The associate membership program facilitates linkages to service providers, experts to enable these growers to get sound advice.

Smallholder Integration

Smallholders represent a small portion of the commercial activity of the industry but have established value chains orientated to three processors under different commercial models. Nut quality is sufficient to justify commercial processing and there is capacity established to aggregate, dry and grade NIS. The sector is estimated to consist of 4 broadly regional farmer organisations of 5,000 farmers establishing 600,000 trees over the last 20 years.

Cooperation on themes such as technical issues enable diffusion of good practice, standardisation of practices and increasing awareness of the working of the industry and help align agendas. There are challenges to integrate these sources of production into the industry body in a fair and equitable manner. Inability to verify ha/ n of trees established combined with low productivity and KR% could skewer industry wide statistics.

Smallholders were previously represented at the TNGA via ADMARC and subsequently by project initiatives. There is potential to offer a smallholder position to represent smallholders and to look at how the very different context presented by smallholders can be accurately captured in industry statistics. An initial policy to enable membership based on dNIS delivered to factory at 10ha equivalent of 11.22 MT per annum on the 5yr industry average(1,122kg dNIS/ha).

Interactions with External Institutions

Greater interaction with international industry bodies

The World Macadamia Association is new organisation established to coordinate marketing activities globally fees of \$10/MT dNIS would cost the TNGA \$77,400. The TNGA intends to join in 2021 with a phased approach initially as a class B member representing 40-50% of the industry 'part of country'. This step would enable the Malawian Industry to shape early priorities while benefiting from market development work being conducted. Explore means of increasing linkages and interactions with SAMAC and AMS on technical issues and R&D to promote innovation. Some Malawian NIS is processed in RSA, establishing a mechanism that captures this commercial model accurately in national level statistics as well as levy's incurred at both origins to prevent double accounting.

Security & Source of Origin Certificates

There is a need to strengthen traceability and tracking of the supply chain at present no legislation is in place to regulate purchase, trading and export of macadamia kernel or NIS. A system for members to produce official certificates that verify the origin of nut to officials would facilitate identification of illegal consignments. The certificate could accompany consignments providing detail of origin but would need to be recognised by law enforcement agencies which requires collaboration with public institutions.

Certificates would establish the framework to better control organised, large scale illegal exports, however, action is also required at more local levels. Theft from farms is a significant issue and particularly acute in some areas. Security issues manifest at different scales from organised theft of large quantities for export to small scale to process and sell locally. Coordination with local law enforcement, district level structures alongside community engagement can help curtail theft and make street vending more difficult as a combined strategy. Given the number of institutions involved, several ministries, law enforcement as well as local structures the establishment of a security task force to coordinate the work on security would help identify successful models.

Export Facilitation & Logistics

Currently the marketing and export of macadamia in Malawi is primarily limited to large producers and cracking facilities. The membership of the World Macadamia Organisation will provide additional market linkages and opportunities for the Malawi macadamia industry. Greater collaboration is required with the Ministry of Trade and Industry, as well as the Malawi Investment Trade Centre to improve movement of goods. Trade agreements with the European Union, USA as well as within Africa through SADC and COMESA, need to be extended to create more marketing opportunities particularly with Asia.

In terms of logistics exports have been by road to the Port of Beira in Mozambique, over reliance on a single route and lack of options presents a risk. New rail routes have been opened to Beira and Nacala the feasibility of these alternative routes needs to be further explored to determine if deliver efficiency to the export chain. This will require collaboration with the Ministry of Transport and with Central East African Railways.

Financial Model

A more active TNGA will need to run activities and raise its capacity to interact with organisations and institutions. Running these activities will inherently require resources both human and financial. This section will layout a viable financial model detailing how funds can be raised and allocated. The types of membership available the fees each attracts, followed by an outline budget and key resource needs.

The overall approach is to finance a core budget to provide the main services from membership subscriptions and a dNIS levy of \$3/MT. This will cover administrative functions, industry events, collection of statistics. These core activities are permanent required every year and hence require a sustainable financial model to ensure continuance. The platform provided by the organisation will be able to develop partnerships and collaborations to implement 'special projects' which are discreet. This will leverage the resources of the TNGA to access funding to cover one off activities such as developing a website, establishing an industry database or conducting research.

Membership Classes

To enable engagement and participation by the whole industry more categories of membership are required. These emulate other industry bodies and the benefits offered by each classes vary a detailed breakdown of each class is presented in **Table 5**. Grower and processor memberships infer voting rights but come with obligation to submit statistics. Associate memberships are designed for actors with a commercial interest in the industry and provide access to statistics/ contacts but do not convey voting rights. The final class of membership would be 'free' where by interested parties could access top level statistics, technical materials and newsletters. Full details of each membership class and its associated benefits can be found in Table 5.

Different fee classes offer the ability for more actors to become involved and interact with the industry. Particularly there is a growing number of Malawian owned farms in the 5-25ha range who currently have no representation. Furthermore the provision of services has been focused in the southern region and within a small group of companies. As new farms develop it is important that they are able to identify sound advice and inputs the presence of service providers will aid the development of additional service sector of the industry.

A producer membership can be obtained if the farm is over 10ha in size or in the case of a farmer organisation supplies 11.22MT of dNIS (10ha ave yield equivalent) into a factory or export market. If a producer does not fulfil this key requirement then they could opt for an associate membership of a free account and still gain access to technical resources.

TABLE 1 MEMBERSHIP FEE RATES OF MACADAMIA INDUSTRY BODIES

Class	AMS	SAMAC	TNGA
Producer	\$263	\$40	\$250
Processor/ Handler	\$720	\$443	\$750
Associate	\$308	\$201	\$300

Membership 'flat' Fees

Currently no annual 'flat' fees are charged to TNGA members, this has been a major inhibitor on offering more services previously. SAMAC and AMS charge different membership fee rates for classes detailed in Table 1. This model would raise \$11,250 Table 2 per year and prioritised to core administrative functions such as the AGM, meetings, technical events as well as website content development and maintenance.

The proposed fee structure is comparable to fees levied to other origins designed to cover core administrative functions.. The proposed Malawian model flat fees would contribute 33% of organisational revenue. In other origins membership of the industry body is not mandatory although the vast majority do join to receive a similar range of services proposed in the roadmap.

TABLE 2 FLAT FEE REVENUE

Membership Type	Estimated n	Membership Fee	Projected Revenue
Processor	5	\$ 750	\$ 3,750
Producers	12	\$ 250	\$ 3,000
Associates	15	\$ 300	\$ 4,500
			\$ 11,250

Scaled Fees

Scaled fees are proportional to enterprises commercial activity in dNIS or land holdings, other origins use dry NIS at 3% moisture as a basis to calculate fees. dNIS is used because it is the traded commodity between farms and factories or exporters; therefore verifiable data is available to base fees at factory gate or at issuance of export certificate. In both SAMAC and AMS scaled fees account for over 98% of revenue at a rate of \$190 and \$40/ MT dNIS respectively. These resources in addition to the 'core' functions have paid for the extensive research and development programs as well as marketing activities.

There is a strong case for Malawi to align with other organisations and use a dNIS basis to calculate scaled fees. However, basing on NIS volumes has some drawbacks firstly there is a 50% chance that seasonal variation exceeds +/-20% on the previous year (Figure 5 10 year variation in NIS production in Malawi (1.5% moisture content) which makes revenue more difficult to accurately project. However this would mean any fees are proportional to farm production and only once nut production had commenced. Hence the fees paid would be directly proportional to the productivity of the farm. An area based payment would be the same for any mature orchards irrespective of age or seasons production. However new entrants in early phases of establishment have arguably the most to gain from the network and support membership would bring but would not be paying into a dNIS system.

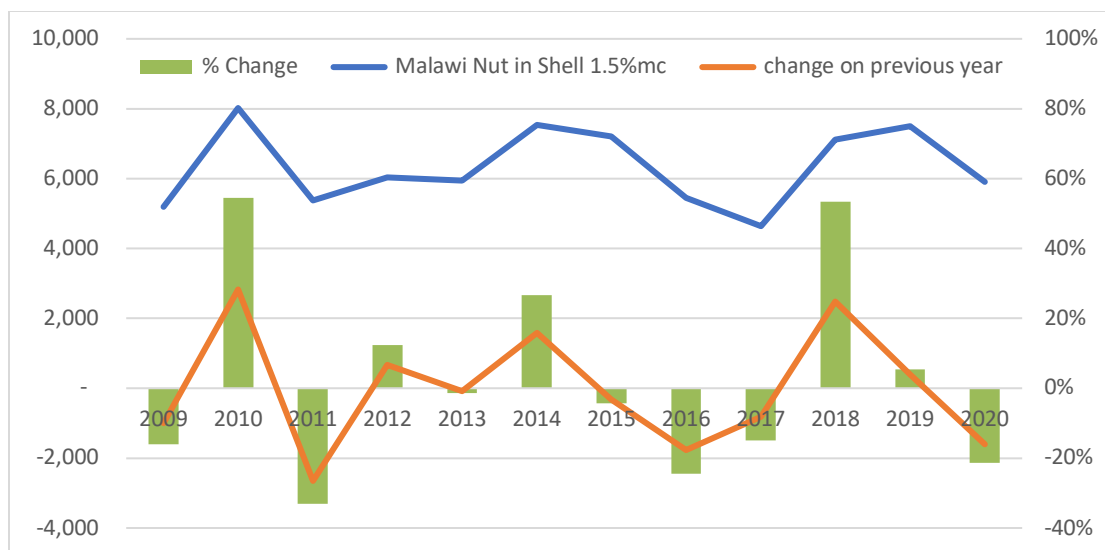


FIGURE 5 10 YEAR VARIATION IN NIS PRODUCTION IN MALAWI (1.5% MOISTURE CONTENT)

An alternative approach would be to use mature ha (+6yr) as the basis for fees; this would be more predictable because declared establishments would be known well in advance. However in poor seasons fees would be the same irrespective of productivity which places fees outside the agricultural cycle. Furthermore a 6 year old tree would cost the same as a 15 or 20 year old tree that would yield farm more. This would skewer the levy to younger and less productive farms. Particularly in this phase of the development of the industry close to half the tree stock would either be too young to enter the system or in the early phase of production. Adopting an area based system would be diverge from well-established systems established in other origins. This could make comparison and integration more problematic when the global industry is becoming more closely knit. Area based systems rely upon accuracy of declared Ha of each member. Given that the scaled fees are anticipated to constitute 25% of organisational revenue and at far lower rates than other origins either model is viable for the needs of the TNGA at this time.

If a dNIS system is adopted then a mechanism to account for dNIS exported (either for processing or sale) would also need to be established. A ha system would automatically cover all establishments irrespective of final market. There are 2 legitimate routes for dNIS either to a Malawian factory or export, this provides 2 different verification points. Factory based transactions could be incorporated into the contracts and invoicing system. For dNIS exports a certificate could be issued by the TNGA to facilitate transport and collect associated fees. Further work is required with factories to implement the proposed system and with customs/ border officials to integrate use of the certificate.

Working budget

Consultations with members clearly stated their desire to have a more active organisation and recognised that to achieve would require resources. However, there is a necessity to develop a lean organisational structure to ensure core functions and services can be sustained without the need for external support. Modest expenditure on activities can greatly improve the level of interaction with membership and provide services of use to members and strengthen the industry as a whole. In this phase of the

organisations development the priority is to demonstrate the value of the organisation through improvements to priority services.

The fixed and scaled subscription rates have been set to achieve the goal of covering core activities including but not limited to:

1. A minimum of 2 themed industry events per year addressing key technical issues identified by members. These include farm field days to demonstrate new and innovative best practices, technical seminars to enhance agronomic knowledge .
2. Collection, analysis of industry data and the production of an annual report and benchmarking of productivity and quality focused indices
3. An annual general meeting to vote on budget, activity plans for the following year and review the levy/ membership fees
4. Establishment of a secretariat to handle administrative functions, organising events and engagement with external institutions
5. Coordinate projects and interactions with external organizations
6. Represent the industry at international events and with public institutions
7. Produce auditable accounts
8. Maintenance of a website
9. Production of a bi annual newsletter

Revenue from Flat & Scaled Fees

A target budget of \$30,000 has been identified as sufficient to cover core administrative functions and regular events/ activities outlined above. This will be generated by the flat and scaled fees fee (Table 3) this is anticipated to grow to \$49,750 over the next 5 years. Table 3 presents a revenue simulation over the next 5 years to provide a working basis for financial planning. Revenue base will grow as producers crop matures and NIS volumes grow. A proportion of revenue may also be available if favourable conditions prevail for investments and specific activities such as development of a website, procuring secretariat services or engagement with partners.

TNGA NIS system Core activities/ overheads with secretariat

Source	n	Unit (\$)	Total (\$)	Proportion
Processor & Processor	5	750	3,750	11%
dNIS Scaled Fees	7500	3	22,500	67%
NIS export certificate	0	3	-	0%
Producers Membership Fees	12	250	3,000	9%
Associates	15	300	4,500	13%
			33,750	

A more detailed projection based on intended plantings should be conducted to confirm these assumptions. Projections should capture anticipated plantings and potentially account for the anticipated yield under irrigation. A systematic methodology for documenting establishments based on planting density can also contribute to accurate tree population and area under crop. The project is based on 5 year averages of tree establishments and yield data.

TABLE 3 SIMULATED TNGA REVENUE OVER THE NEXT 5 YEARS

Source			2021		2022		2023		2024		2025
Fixed fees	unit \$	n	\$	n	\$	n	\$	n	\$	n	\$
Processor	750	5	3,750	5	3,750	6	4,500	7	5,250	7	5,250
Producer	250	12	3,000	15	3,750	18	4,500	20	5,000	22	5,500
Associate	300	15	4,500	20	6,000	25	7,500	30	9,000	30	9,000
Total Fixed Fees			11,250		13,500		16,500		19,250		19,750
Scale Fees NIS	3	7,500	22,500	8,000	24,000	8,900	26,700	9,400	28,200	10,000	30,000
Total			33,750		37,500		43,200		47,450		49,750

World Macadamia Organisation Membership

The global industry has benefited greatly by investment in market development led by AMS, these have fostered new markets, increased awareness and consumption of macadamia nuts. However despite Australian initiatives benefiting all origins it has led to a lack of origin differentiation and the needs and interests of smaller origins not being represented. As part of an initiative to spread the burden more equitably across the global industry has led to the establishment of the World Macadamia Association. The organization has been incorporated in 2021 and already has many of the major producing countries on board, who already have a statutory levy to draw from to cover the costs of membership.

There is a strong case for Malawi to join this initiative on macadamia marketing and influence the agenda as the organisation is establishing. Two classes of membership have been offered a class a ‘whole country’ represented by the industry body or class b where individual companies join. Table 4 details the cost and options based on NIS projections over the next 5 years. Joining under a Class B membership would enable a proportion of the industry to join while greater consensus is developed around the value it generates.

A class membership would require reviewing the levy but may be feasible to reduce this cost through external resources through a transitional phase where the proportion of the industry grows from 50%. Initially a subset of the industry particularly keen will join and over the subsequent years a larger proportion until a Class A country membership can be achieved. Because of this approach individual companies will be responsible for contributions. The TNGA will work towards a class A membership by 2025 and integrate the fees into their budget only once there is consensus from members. The projected costs of the membership and transition over the next 5 years is presented in Table 4. If there is consensus from members and a willingness to absorb the cost of WMO membership, then alternative times lines can be adopted to accelerate this process.

TABLE 4 PROJECTED COSTS OF WMO MEMBERSHIP AND TRANSITION TO CLASS A MEMBERSHIP

	2021	2022	2023	2024	2025
NIS (MT@1.5% MC)	7805	8070	8875	9414	9962
WMA Class A Member	\$78,046	\$80,697	\$88,748	\$94,138	\$99,617
% of industry	50%	60%	75%	90%	100%
Membership Fee	\$39,023	\$48,418	\$66,561	\$84,724	\$99,617

Potential Influences on Roadmap Outcomes

Influence	Likelihood	Impact	Notes
Adverse Climate Conditions Significantly Decreasing Productivity &/or Quality	High	Medium	NIS production will continue to be influenced by climatic conditions. Intense storm events commonly coincide with pre harvest phase of the production cycle causing significant crop loss and potential damage to trees. Extended hot periods are increasing and more prevalent in some of the newly established areas. These can enhance pest populations and cause stress on the trees leading to premature nut drop particularly in younger orchards.
Significant decline in Kernel Price	Medium	Medium	High kernel prices have been sustained for an extended period driven by high demand and variable production globally. As the market cycle moves, pricing could become less favourable, this in turn could curtail or delay planned establishments or reduce margins limiting the ability for farm to invest in innovative production systems.
Significant change to Market Demand for Quantity and Styles	Low	Medium	Macadamia is processed into 9 styles ranging from large whole nuts through to small chips and dust, however, market demand is not equal across all styles. This makes some styles more difficult to sell, thus represents some commercial risk. Post-harvest handling, drying, and processing can influence the style makeup and thus potentially add value to crop. Asia drives demand for NIS exports although significant increases in their own production capacity are likely to reduce demand from this origin in the medium term. Some Malawian producers are or intend to export NIS for processing in South Africa.
Security measures unable to curtail theft from farms	High	High	There are no legislative structures in place to establish rules of origin or authenticity this makes control of illegal trade more difficult. Production losses to theft increase the cost of production, lower commercial yield and increase security costs together disincentivise investment in the crop. Increases in organised theft will reduce the competitiveness of the industry as a whole and potentially lead to reputational damage as unregulated NIS exports of low quality are associated with the origin. Without proactive management theft could increase applying further pressure on the industry and squeezing margins.

Decline in Quality, measured by sellable kernel recovered % at industry level	Medium	Medium	The viability of commercial macadamia production is highly sensitive to the proportion of kernel which is sellable. Malawi averages 26.5% sellable kernel, however, results do vary considerably between 20-32% through the industry. An estate achieving 30% would produce a third more sellable product than at 20% exerts a strong influence on margins. Quality is a result of the production system at farm level, hence the capacity of decision makers to make the right informed decisions. Given the number of new entrants using new systems of production, in new areas capacity is required to achieve.
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Key Milestones of the Roadmap

The milestones will function as checkpoints to achieve the goal, they are designed to identify what stage the TNGA is at.

Milestone 1: All dues paid under new revised membership and fee structure

- a. Revise constitution, adoption of an updated constitution at the 2021 AGM updated to the new position holders and norms of the industry
- b. Membership classes and associated fee structure approved
- c. Establishing the mechanism to collect fees from factories and issuing export certification
- d. Class B part of country World Macadamia Association membership for 50% of industry

This milestone should be completed in the first 12 months of the roadmap. As it will provide the resources, framework and mandate to the board to implement the roadmap. There are modest changes to the constitution but more profound changes to the services provided by the industry body and how it is financed. It is important to develop consensus amongst membership in order to adopt through a series of in person and online events.

Milestone 2: Communications with membership, industry bodies and public.

- a. Identification of service provider to design and host the website design
- b. Drafting of content for the website
- c. Biannual newsletter launched
- d. Collecting materials for the technical library
- e. Launch of TNGA website
- f. Engagement with SAMAC on R&D and statistical issues

The objective will be to raise the profile of the organisation to present publicly information about the industry and provide a point of contact for any enquiries. The development and launch of the website could be achieved in the first 6-12 months of roadmap implementation. The website will perform important functions for members being able to submit statistics, access technical resources but also industry data. Overall, will present a more cohesive and professional brand for the organisation particularly to external actors and partners. The continued administration of industry groups on messaging apps will provide channels for industry players to exchange information and pose issues.

Milestone 3: Restart Technical Capacity Events

- a. Identify and prioritise themes for field days and industry seminars
- b. Organise bi-annual field days & technical seminars,
- c. Coordination of a pest scouting training course annually

This milestone is ongoing several events organised in 2020 and 2021 have unfortunately been cancelled due to covid restrictions. These events could commence in the first 3 months and be conducted every 3-6 months coinciding with seasonal lulls in activity. At least one field day a year should take place out of the southern region to improve participation of growers in other regions. Themes could be identified at the AGM for the priority for the following year providing time to set up the field day and identify external

experts if required. An annually delivered pest scouting course in future the range of courses could be expanded to develop a foundation for macadamia course.

Milestone 4: Develop TNGA management Information system and data resources:

- a. Membership Directory and fee administration
- b. Origin Certificates
- c. Industry Statistical monitoring
- d. GIS to hold farm locations and provide analysis

Work already undertaken to update the industry directory and review the methodology to collecting statistics will directly feeding to enabling this work to commence. Improving what data is collected and holding it in an appropriate environment will provide greater insights for the industry. The ability to be able to more accurately project growth, identify trends in productivity and quality will underpin effective planning and focus technical themes. Envisaged as a modular system where there is a membership management system, industry statistics and the ability to issue export/ origin and phytosanitary certificates.

Milestone 5: Establishment of a Security task force

- a. Provide coordination to counter act theft, movement, and sale of stolen NIS.
- b. Engage public institutions to curb illegal exports and coordinate law enforcement
- c. Work with communities to raise awareness of impacts of theft

A holistic approach is required to curtail theft and strengthen security, it will involve engagement at multiple levels with public institutions at local and national level as well as within the industry. The provision of advice, best practice and support on approaches to security from the TNGA network would help producers minimise and reduce exposure. Members would be able to raise awareness of issues in their area through an alert system. At national level coordination with boarder officials to make export of illegal NIS more challenging and identifying stolen consignments during transport.

Work to start this work package needs to start early, engagement with public institutions to develop policy and implement are likely to take several years to achieve.

TABLE 5 PROPOSED MEMBERSHIP CLASSES WITH ASSOCIATED BENEFITS AND FEES

Membership Benefits	Free	Associate	Grower	Processor
Who is this for?	Interested Individuals & Organisations	Small Farmers, Service Providers & Commercial Partners	Macadamia Farmers over 10ha	Macadamia Processors
Annual Fee	\$0	\$300	\$250	\$750
Information				
biannual Newsletter circulated electronically	X	X	X	X
Invitation to Events	X	X	X	X
Access to Technical Content, manuals, web links to open-source information	X	X	X	X
Access to advanced content industry R&D, technical notes		X	X	X
Access to Industry Service Provider Directory	X	X	X	X
Advertise & Promote Services		X	X	X
Access to full industry directory		X	X	X
Membership of Industry social media groups		X	X	X
Pose questions to the technical advisor and industry			X	X
Events				
Field Days		X	X	X
Technical Seminars		X	X	X
AGM attendance			X	X
Voting Rights			X	X
Industry Statistics				
Access to National level Industry Data	X	X	X	X
Detailed National Data		X	X	X
Member Data Profile			X	X
Submit quarterly Statistics			X	X