



Inclusive Sector Growth Strategy, for Poverty Reduction and WEE Fiji Horticulture and Agro Export Sector

Market Development Facility

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Chapter 1: Main findings of the sector assessment

The most promising growth potential for horticulture in Fiji is through the export market. On a smaller scale, there are opportunities to improve off-season cultivation, cultivation of new crops for the domestic market, and cultivation of niche crops for the tourism market.

The export of agricultural products from Fiji has increased over the last few years, with a large variety of crops being exported. There is a need to focus on the most important and most promising crops, which include chilli, cowpea, eggplant, okra, papaya, and pineapple. All of these crops have open pathways to Fiji's key export markets (Australia and New Zealand) and opportunities for increasing both fresh and processed exports. However, exporters face difficulties in sourcing the right quantity of high-quality products. If export crops can be grown in greater quantity and in good quality, exporters could absorb that increase, and producers could sell more and increase their income.

Space availability in air cargo might become a restricting factor for growth. However, the current use of sea freight by one exporter to ship eggplant, leafy vegetables, and papaya has come as good news for the sector. If sea freight space for exporting produce is more widely available, then a new window of opportunity will be opened for the country's exporters.

Local markets for existing local crops are largely saturated. However, increasing off-season production would help stabilise prices and reduce imports. In addition, there are opportunities to increase cultivation of crops that are not currently grown, or not grown in large volumes, but that can be grown in Fiji and for which there is a large local demand. Because the introduction of completely new crops has various challenges and would take time for farmers to adopt, the focus will be on off-season production and increasing production of existing crops such as lettuce, tomato, and zucchini.

Demand from the tourism market is also increasing as hotels and resorts become more interested in replacing imported goods with locally grown produce. The potential for growth in this market comes from improving quality and maintaining year-round cultivation of niche crops. Locally sourced produce often does not meet quality specifications, but if its quality improves, and it is produced in needed volumes on a consistent year-round basis, then more local produce will be purchased by hotels and resorts. This market will be largely addressed by MDF's Tourism Sector Strategy.

Overall, for growth to continue in the horticulture sector, several conditions need to be met:

Access to markets

This is critical to move farming households from small-scale production for the limited local market to semi-commercial or specialised production for key markets, particularly exports. Male and female farmers producing a large variety of crops in small volume for the local market have limited opportunities for increasing sales and income. Regular market access through exporters and wholesalers allows farmers to sell larger volumes on a more regular and consistent basis. It encourages them to pursue more specialised cultivation, focusing on producing larger volumes of a smaller number of key crops for which there is growing and stable demand. This requires strong market linkages between exporters, wholesalers, and farmers.

Increased horticulture farming

This is needed to increase the volume of key crops. This could include increasing the land area devoted to horticulture, improving productivity, and moving into year-round rather than seasonal cultivation. New land for horticulture could come from former sugarcane land and the more than 33,000 ha of fallow land in Fiji. If the current low yields for horticulture in Fiji are improved—

through better use of inputs and better crop planning and soil management—the volume of produce would increase even without expanding into new land. Moving to year-round cultivation would ameliorate price fluctuations and cycles of over- and under-supply and would increase male and female farmers’ access to the tourism and export markets, which require consistent and reliable supplies.

Quality improvements

These are essential for competitiveness in the export and tourism markets. Quality issues arise mainly from inappropriate cultivation methods and crop planning and improper post-harvest handling. To address them male and female farmers need more knowledge, better communication with end markets (including about quality requirements), and better equipment.

Better connections to value-adding processors

This would help male and female farmers avoid the wastage and low prices experienced during times of peak supply. Fiji has a limited number of processors, and they have limited links with horticulture producers. If these links could be improved, more processors could source local produce for processing and value-adding

Alignment with the Government of Fiji

In terms of MDF and its alignment to government priorities, so far efforts have mainly been effected through collaborations and partnerships with the private sector strategic partners to achieve sustainable solutions which is expected to influence a wider systemic change in the selected sectors. At the same time, there has been continuous dialogue with the noted government ministries, departments and statutory agencies (as necessary) to ensure inclusive approach when designing interventions. There are few potentials currently being explored by MDF to engage directly with the government in the ‘rules and enabling business environment space’. The Annual aggregation results published annually clearly demonstrates how the Facility is supporting government in meeting the national goals. The table below outlines the efforts by MDF to work within the development framework set out by the Fijian government and elaborates how MDF’s projects (interventions) complement governments effort in achieving development in Fiji.

Table 1: Analysis of MDF’s efforts towards relevant government policy objectives and strategies

Specific Government Policy	MDF’s Strategies and Efforts
<p>Non-Sugar Agriculture and Livestock</p> <p>Goal: Sustainable community livelihoods through food security and competitive exports.</p> <p>Policy objective: Fiji is served by a thriving agriculture sector that sustains Fiji’s food security and sets a strong platform for commercial agricultural development.</p> <p>KPI:</p> <ul style="list-style-type: none"> ▪ Increase agriculture sector’s contribution to GDP from 12% to 15%. ▪ Value of annual non-sugar agriculture exports increased to \$100m by 2014. ▪ Value of fruits and vegetables imports reduced from around \$150m 	<p>Horticulture and Agro Exports Sector</p> <p>Based on the assessment, MDF will focus on horticulture export. To this end, it expects to work closely with exporters to help them work more intensively with farmers to boost production and supply. In parallel MDF expects to work on agro inputs(Seeds, lime, farm implements, information) to help small farmer get more access and use of it. Following this dual approach, MDF sees it to align with the government priorities in the following lens</p> <ul style="list-style-type: none"> - Increasing agriculture sector GDP contribution - Enhancing non-sugar agriculture exports

Specific Government Policy	MDF's Strategies and Efforts
<p>annually to \$80m by 2014.</p> <ul style="list-style-type: none"> ▪ Increase lending to agriculture sector by commercial banks to 1% of total loan portfolio by 2014 from current level of around 0.6%. ▪ Agricultural Census completed by 2010. 	<p>The strategy is also likely to impact on reduction on import for fruits and vegetables but that is more addressed with MDF's work on tourism and related industries and services sector</p> <p>Aspects relating to lending are also being dealt with by MDF but in the Export Processing sector</p>

Furthermore considering Fiji is faced with labour shortages in this sector, there has been an ongoing dialogue with the **Ministry on Labour** on the labour mobility concept. At the same time, efforts have been rolled out towards farm mechanization to achieve farm efficiency and returns through engagement with the private sector.

The **Bio-Security Authority of Fiji** (BAF) manages quarantine controls at the borders to minimize the risk of exotic pests and diseases entering the country. It also provides import and export inspection and certification to help retain Fiji's favorable animal, plant, and human health status, and wide access to overseas export markets. MDF has discussed plans to enter into a Memorandum of Understanding with BAF to facilitate a commercial company's effort to import better quality seeds from recognized sources internationally. Other potential roles with BAF could be to help establish a marketing awareness campaign to further educate exporters and farmers on the quarantine regulations of importers to ensure access to updated information for all stakeholders.

Other similar commercial statutory authorities involved in the agriculture sector include Rewa Rice, Food Processors Ltd, Coconut Industry Development Authority, Copra Millers of Fiji, Agricultural Marketing Authority, Fiji Co-operative Dairy Company Ltd and Fiji Meats Industry Board.

Chapter 2: Key constraints and opportunities in the market system

2.1 Constraints

Most constraints on growth for horticulture and agro-exports arise from lack of information, communication, transport, or high-quality inputs.

Dependence on limited market channels and transport

The linkages between agricultural production and markets are weak. The desired crops, quantities, and quality specifications are not communicated effectively from the end markets to both male and female farmers. Exporters and wholesalers struggle to source the right quantity at the right time and need better sourcing options.

Opening new markets or increasing exports to existing markets also requires adequate transportation. Finding air freight space is a challenge for exporters. The number of flights departing from Fiji is limited, and frozen fish get top priority in allocating cargo space. Some transportation options (such as sea freight) and preservation options, such as modified atmospheric packaging (MAP), are largely unexplored.

There is limited processing of local horticulture products in Fiji. Processed items have the potential to reach new markets, or increase their share of existing markets for which opportunities in fresh produce are limited.

Lack of information on efficient cultivation techniques

Information on cultivation methods and disease management is hard to find in Fiji. Farmers' most accessible source of information is their fellow farmers. In some cases, such information sharing is useful, but farmers often miss important new information. During sector scoping, many farmers indicated that they do not think that retailers can provide them with necessary information on farm management and disease control. Retailers said that farmers usually shop for specific items and do not ask for advice or information.

Most farmers believe that extension service providers are able to help, but they are not equally available in all places. According to the information from key informant interviews, the Ministry of Agriculture (MOA) has useful knowledge in many areas but is not reaching male and female farmers equally.

Limited use of good crop planning and soil management practices

Many farmers do not practice appropriate crop planning. They choose crops based on availability of seeds and inputs, ease of cultivation, weather favourability, and labour requirements. Thus, almost all farmers in a given area grow the same crops at the same time. This creates oversupply in local markets, bringing down the price to an almost non-profitable level.

The heavy use of blended fertilizers and other chemicals, over-cropping, and climate change have seen the average pH of soil in Fiji deteriorate to around 5.3. According to the Koronivia Research Station, the soil pH needed for vegetable farming is between 5.4 and 5.9. Farmers are aware that soil

sampling needs to be done, but most are not trained to conduct it without the supervision of MOA extension officers¹. MOA extension officers provide soil sampling and interpretation of results to farmers at no charge. However, due to their complexity, these results and recommendations rarely make it back to the farmers. A number of farmers complained that these services are inefficient and so they take their own soil samples to the Koronivia Research Station for testing. Some are turned back due to an insufficient amount of soil (the required minimum is 1 kg) or improper soil sampling. Soil testing has a target three-week turnaround time, but delays occur due to financial constraints or an insufficient supply of chemicals.

Lack of quality inputs

The availability of inputs has been one of the biggest challenges for male and female farmers in Fiji.

Seeds

There have been complaints about seed germination, and field findings show this often occurs from lack of knowledge on how to store and use seeds. For example, suppliers sell imported seeds that have been in storage for too long or have been repackaged inappropriately and have lost their moisture content and purity. Importing a new variety of seeds into Fiji is a big challenge because it must be tested by MOA for three consecutive years before import permission is given.

Fertilizer

Farmers rarely use the right quantity of fertilizer, and sometimes the quality of fertilizer available in the market is questionable. The blends supplied by South Pacific Fertilizers were developed based on a soil test survey done 20 years ago and have not been improved since. It is difficult to determine if the compositions are effective for current soil conditions. The main fertilizer used by farmers in Fiji, urea and NPK (nitrogen, phosphorus, and potassium), is supplied by South Pacific Fertilizers to sugarcane growers at a subsidized price through the Fiji Sugarcane Corporation. If it is purchased outside of that scheme for other crops, it costs nearly twice as much. Therefore, most farmers try to get fertilizer under the subsidized scheme and use it for cultivating other crops. If that is not possible, they purchase it in small amounts.

Overall, importers and suppliers are risk averse. Before they try new ideas in the market, they want to be absolutely sure about them. On the other hand, as the agricultural input market is small and existing importers are well established, it is difficult for a new brand to compete. Farmers are reluctant to try new things unless it is absolutely necessary. Marketing and promotion of agro-inputs are not very visible except when MOA arranges events or field activities.

Agricultural Lime

A vast majority of soils in Fiji have been found to be largely acidic. Due to this, the crop productivity of many farming areas in Fiji has declined. The application of agricultural lime used to be practiced years ago in the sugar cane industry but had slowly phased out with the introduction of blended fertiliser. The product has been imported from New Zealand and hence only those farmers that could afford it (FJD 700 per tonne excluding freight costs) would purchase it. A lot of smallholder farmers are not aware of the benefits of agricultural lime. The reintroduction of a locally produced agricultural lime has required a lot of marketing and promotion with key stakeholders such as Fiji Sugar Corporation (FSC), Fiji Co-operative Dairy Company Limited (FCDCL), MOA and Fiji Development Bank (FDB).

¹ Aglime for Fiji http://marketdevelopmentfacility.org/?type=publication&posting_id=3679

Crop protection chemicals

Crop protection chemicals can gradually lose their effectiveness if used continuously. In Fiji, most chemicals in the market have been used by farmers for more than 10 years, and farmers now have to use more to get the intended results. That not only increases farmers' costs but also has negative environmental effects such as killing useful organisms.

Most farmers are unable to identify the disease or pest attacking their crops and thus often use the wrong chemicals. Some farmers use a higher than recommended dosage, which also has negative long-term effects. The unavailability of low-cost, effective solutions to diseases and pest infestations, and over-reliance on a limited range of high-cost imported chemicals, are major constraints for farmers.

Like new seed varieties, new crop protection chemicals must be tested by MOA before they are cleared for import. The product label also has to be printed in three languages (English, Fijian, and Hindi). This process takes almost a year. Therefore, even if a new effective chemical becomes available, importers act carefully and reluctantly to introduce it.

Lack of information and inputs to extend cultivation seasons and cultivate new crops

Crop seasonality and lack of crop diversification in a given area lead to over- and under-supply, price fluctuations, and wastage. Only a few crops are grown for the market all year long. Farmers do not have access to the information, supplies, and equipment needed to cultivate in the off season. For example, crop covering would help farmers grow tomatoes in the rainy season, and irrigation pumps would help them grow more vegetables in the dry season. Even when equipment is available in Fiji, it is often not affordable for small and semi-commercial farmers.

The scenario is similar for cultivation of new crops. New seeds and specialised equipment are often either unavailable or unaffordable. Farmers do not have information on cultivation techniques for the new crops. At times, wholesalers or importers provide information on new crops and varieties they need, but farmers need access to better information on what to cultivate, how, how much, and to what quality standards.

Other issues

The declining number of farm labourers also affects farmers' decisions on which crops to cultivate and in what amounts, and limits opportunities for expansion. Farmers choose to grow crops and plant on land areas that can be managed using their own and family labour. To reduce the cost of cultivation, increase profitability, and reduce risks, farmers try to cultivate multiple crops at once, especially during the primary growing season. Although this is in many ways a good practice, when the quantity harvested is not large enough to justify the cost of transportation to distant markets, farmers receive lower profits.

The inter-island transport system is a big challenge for marketing of agricultural products. Even if a location has a competitive advantage in growing certain products, farmers there find it difficult to transport their surplus to other regions. When they try to sell the whole amount in the local market, this brings down the price to an almost non-profitable level.

Access to financing is limited. If a medium to large enterprise needs capital investment or a loan to expand, there are few options, perhaps only one: the Fiji Development Bank. This bottleneck is a serious constraint to the growth of the private sector.

Uncertainty regarding the renewal or extension of land leases is a big challenge for Indo-Fijian farmers. According to field findings, most leases of Native Fijians lands are expiring at the same time, and for a majority of farmers there is no guarantee that they will be able to extend their lease and retain the same piece of land for the next lease period. A majority of respondents echoed this concern and said it has affected their future growth plans. Therefore, they do not invest much money or time in developing the land. Key constraints are summarized in Table 2.

Table 2: Key constraints in the horticulture sector and its markets

Constraint	Explanation and causes
<p>Dependence on a limited number of market channels and means of transportation limits the growth potential of horticulture and agriculture in general.</p>	<p>Exporters and specialized wholesalers, processors, products, and ways of sourcing and transporting are emerging; but overall, the linkages between agricultural production and markets are weak.</p> <ul style="list-style-type: none"> ▪ Systems to develop backward linkages, such as contract farming, are not widely applied; in countries with a small sourcing base such as Fiji, it is difficult to develop cost-effective sourcing mechanisms. ▪ New transport and processing techniques are not always widely known. ▪ Financing for investment in agribusiness is hard to obtain. ▪ Family-driven export businesses may overlook opportunities in other markets.
<p>Limited access to extension services results in farmers applying ineffective cultivation techniques, experiencing low yields, and facing high rejection rates from exporters; it also makes diversification into new crops and new growing seasons more difficult.</p>	<p>Public sector extension services have a limited reach.</p> <ul style="list-style-type: none"> ▪ Public extension services focus on a limited number of farmers and crops. ▪ Public extension sector have limited resources to effectively manage and deliver these services to the farmers. <p>Private extension services do not yet exist.</p> <ul style="list-style-type: none"> ▪ Private sector actors still tend to see provision of extension services as a public role, despite the private benefits they would gain from it. ▪ Private sector actors often do not have a strong agricultural background; hence they are not familiar with providing extension services to farmers. ▪ Private sector actors are reluctant to invest in services from which competitors might benefit (for example, if a farmer receiving services from one company sold to a different company).
<p>Limited access to other types of information on farming creates similar problems.</p>	<p>Information providers such as telecom companies haven't discovered value-added services such as content and text messaging services as a commercial proposition; media outlets may not be sufficiently targeting agricultural advertisers.</p> <ul style="list-style-type: none"> ▪ ICT providers are not very familiar with providing content as a means to generate more business (the first attempts have been in branchless banking). ▪ ICT providers are not very familiar with rural and agricultural services. ▪ Media outlets might be not aware of the potential of targeting audiences with agricultural programs. <p>Private sector actors do not realize the value of providing information as an embedded service.</p> <ul style="list-style-type: none"> ▪ Exporters, processors, and input suppliers provide some advice on an ad hoc basis as a public service, but do not realize there is a business case for a more organized approach. ▪ Exporters, processors, and (to an extent) input suppliers often do not have a strong agricultural background; hence they are not familiar with ways to provide cultivation-related information to farmers.

Constraint	Explanation and causes
<p>Limited access to good quality and appropriate agricultural inputs (agricultural lime, seeds, seedlings, fertilizer, and crop protection chemicals) and labour-saving equipment prevents farmers from getting higher yields and better prices (for a higher quality product), cultivating more land, planting new crops, and/or extending growing seasons.</p>	<p>Available seeds are of mixed quality.</p> <ul style="list-style-type: none"> ▪ Fiji is a small market in which branded seeds are not marketed directly but only through importers selling a range of products; often low quality seeds have better volumes and margins than high-quality seeds. ▪ Farmers are insufficiently aware of the benefit of investing in high-quality seeds and seedlings. <p>Fertilizer use is low, and blends might not be appropriate.</p> <ul style="list-style-type: none"> ▪ Farmers are used to naturally fertile soils, and only now that soils are starting to be depleted from intensive farming are forced to start thinking about fertilizing. ▪ Farmers are not aware of the benefits (better yields and less rejection) of proper fertilizer application. ▪ Fertilizer blends were developed for sugarcane and have not diversified along with Fijian agriculture. <p>Crop protection chemicals are not always effective or effectively applied.</p> <ul style="list-style-type: none"> ▪ Effective crop protection chemicals are available, but farmers do not know how to use them correctly and might underestimate the cost effectiveness of proper application. ▪ Due to limited number of available crop protection products and prolonged use over time, it has created resistance in the insect and pest population.
<p>The current short cultivation window results in seasonal over- and under-supply.</p>	<p>Farmers are diversifying into other crops, notably vegetables, but are not necessarily sufficiently aware of how to expand production into a second or third season.</p> <ul style="list-style-type: none"> ▪ Farmers are not sufficiently aware of simple irrigation and crop-cover techniques. ▪ Simple irrigation and crop-cover equipment are not readily available and not well marketed. ▪ Farmers may find it hard to finance to invest in ponds, pipes, plastic, and other requirements because agricultural loan schemes are difficult to access.
<p>The limited number of crops currently cultivated results in overproduction while leaving opportunities for other crops underutilized.</p>	<p>Farmers are diversifying crops, notably vegetables, but other crops are cultivated on a very small scale.</p> <ul style="list-style-type: none"> ▪ Farmers do not get information on how to cultivate new crops. ▪ Companies interested in these new crops—such as food processors, supermarkets, and exporters—are not familiar with how to introduce them or set up contract farming or similar systems.
<p>Special attention area</p>	
<p>Risks related to flooding, storms, and diseases are not a sector-wide constraint per se, but are a serious threat to growth in horticulture because they undermine consistent supply and willingness to invest.</p>	<ul style="list-style-type: none"> ▪ Techniques to protect crops from seasonal influences are not widely known or used. ▪ Information on proper application of disease control is not widely known. ▪ Agricultural best practices need to be disseminated more widely.

Constraint	Explanation and causes
High-value agriculture, which can accept slightly higher transportation costs, offers opportunities in areas such as Vanua Levu.	<ul style="list-style-type: none"> ▪ Connecting more distant farmers to end markets depends on efficient backward linkages (systems for bulking and storage and local processing and semi-processing). ▪ In Vanua Levu, access to planting material can be an issue. ▪ In Vanua Levu, the constraints mentioned above—all related to weak linkages between farmers, suppliers, and buyers—are aggravated.

2.2 Opportunities

The opportunities to address the constraints identified, around which MDF’s strategy is built, are presented in Table 3 and further discussed below.

Table 3: Opportunities for intervention

Intervention area	Opportunities
Diversification of end markets	<p>Work with individual exporters, wholesalers, processors, and other entities such as supermarkets, to invest in ways to strengthen the linkages between agricultural production and end markets through the following actions:</p> <ul style="list-style-type: none"> ▪ Improve sourcing (probably combined with more oversight over agricultural production). ▪ Promote more processing and product development. ▪ Open new markets with the help of marketing, new preservation techniques, and new transport options (e.g., sea freight instead of air freight). <p>Work toward this goal might also entail helping financial institutions to better assess agribusiness risks so that they are more willing to make agribusiness loans.</p>
Establishment of new and better backward linkages and private extension services	<p>Work with exporters, wholesalers, processors, and other entities such as supermarkets, to invest in personnel able to guide and educate male and female farmers and provide oversight over agricultural production. This might be a core way of achieving better sourcing (and hence higher volumes, better quality, and more consistency).</p>
Better access to information on cultivation techniques and input use	<p>This effort builds on the steps mentioned above but is broader in scope.</p> <ul style="list-style-type: none"> ▪ Work with exporters, wholesalers, processors, and perhaps supermarkets on other means of educating male and female farmers—for instance using leaflets and demonstrations. ▪ Work with importers and distributors of agricultural inputs and nurseries on ways of informing their clients, as a form of an embedded service, about proper use of their products. ▪ Work with Information and Communications Technology (ICT) providers on, for instance, mobile-phone-based forms of outreach to farmers (e.g., help lines) regarding cultivation techniques, prices, quality standards, and other critical information. ▪ Work with media outlets in Fiji on programs that inform and educate male and female farmers.
Better access to high-quality agricultural inputs (agricultural lime, seeds, seedlings, fertilizer, and pesticides)	<ul style="list-style-type: none"> ▪ Work with exporters, wholesalers, and processors to distribute high-quality inputs as a way of strengthening their backward linkages into agriculture. ▪ Work with importers to identify, import, and distribute appropriate seeds, fertilizer blends, and crop protection chemicals. ▪ Work with a fertilizer company to develop appropriate fertilizer blends. ▪ Work with a mining company to set up a distribution and marketing channel for locally mined agricultural lime. ▪ Work with banks on loan, hire-purchase, and lease arrangements for investments in agriculture.

Intervention area	Opportunities
Access to the skills and equipment needed for year-round production	<ul style="list-style-type: none"> ▪ Work with the above-mentioned potential providers of agricultural information to disseminate information on second-and third-season cultivation (e.g., how to preserve water for irrigation and shield crops from cyclone damage), possibly combined with the agricultural inputs to make this possible. ▪ Work with owners and suppliers of irrigation equipment to market their products and services (such as pumps and boreholes) more extensively. ▪ Work with suppliers of materials for controlled (covered) cultivation to market their products more extensively, and work with suppliers and importers to identify more suitable products if needed. ▪ Work with nurseries to introduce high-quality seedlings, possibly of new varieties and/or crops. ▪ Work with banks to develop suitable loan products if needed.
Introduction of new crops in order to improve farm incomes and reduce dependence on imports	Work with the above-mentioned potential providers of agricultural information on disseminating information on new crops, possibly combined with the agricultural inputs needed for those crops. Potential new crops include capsicum, red cabbage, and zucchini.
Special attention area	
Promotion of good agricultural practices that help reduce risk and are environmentally and socially responsible	<ul style="list-style-type: none"> ▪ Incorporate emphasis on good agricultural practices in the steps described above (e.g., as part of increasing access to agricultural information; strengthening forward linkages through marketing, distribution, and embedded services; and strengthening backward linkages through extension, information, and input supply). ▪ Where feasible, search out additional opportunities. ▪ Good practices can focus on cultivating varieties less vulnerable to waterlogging, drought, or storms; introducing or further promoting controlled cultivation techniques; and introducing or further popularizing effective use of fertilizer and crop protection chemicals.
Promotion of horticulture and commercial agriculture on Vanua Levu	<ul style="list-style-type: none"> ▪ Work with interested exporters, wholesalers, and processors to develop backward linkages that allow them to source a sufficient volume in a sufficiently efficient manner to make Vanua Levu an attractive sourcing base. ▪ Promote those crops in which Vanua Levu can be competitive and which can be grown in a productive manner. ▪ Encourage potential providers of agricultural information and inputs to target Vanua Levu or establish a base there. ▪ Investigate ways to reduce transportation costs between Vanua Levu and markets on Viti Levu.

Increasing access to diversified end markets through new modes of transportation, processing, and packaging

There are opportunities to work with exporters, wholesalers, and processors on investing in cost-effective sourcing mechanisms that strengthen the links between agricultural production and end markets. New transportation options, such as sea freight, could open new markets and increase exports to existing markets.

Improved backward linkages and private extension services

Quality and productivity improvements can be achieved by establishing backward linkages and private sector extension services from exporters. Exporters need to play an active role to improve their ties with farmers. Trained and knowledgeable field agents who are able to monitor farmers' day-to-day management practices and provide timely and accurate advice would help farmers produce a better quality and quantity of crops. This will benefit not only farmers but also exporters, who will be able to find a sufficient quantity of high-quality products for export. More new farmers can also come on board to provide quality produce that can be linked with buyers in high-value export and tourism markets.

Opportunities are emerging from the services provided by advanced wholesalers like Farmboy in Nadi. Farmboy regularly supplies hotels, resorts, and other retail markets, and sources produce from a pool of farmers that the company works with on a year-round basis. Farmboy provides necessary extension services to the farmers, directs them what crop to grow, guarantees purchases, and offers premium prices for the right quality and quantity of products. Entrepreneurs like Farmboy can contribute significantly to development of the sector. They are better equipped to understand the specifications from hotels and other clients and can translate them to the farmers in their own language. They also have more control over the supply system, which can help them channel products to different markets when there is a greater than usual supply.

Better access to information and services on soil testing through research stations would certainly increase farm production. Farmers have been growing crops for long periods with little or no fallow, and very few engage in proper soil management techniques.

Improved access to better quality inputs

Better access to high-quality agricultural inputs, especially seeds, can be achieved through current or new input suppliers. Current suppliers need to seriously address quality issues by using proper storage, replacing old stock, and making better-quality seeds available to farmers. A chemical supplier has shown interest in importing seeds but is still in the early stages of research and considering options on which country to import seeds from given Fiji's climatic conditions and crop requirements.

Excessive use of fertilizer and other chemicals has also diminished the soil quality, and soil pH has dropped to 5.3 (too acidic). Farmers are not applying lime as it is imported and expensive. However, there is an abundance of limestone in Tailevu. Local processing of lime fertilizer would make it much more affordable and enable farmers to use lime to improve their soil pH level to the 5.4–5.9 level needed for vegetable production. One key informant predicted that adequate soil pH levels would increase current production by at least 20%.

Improved access to information

Better access to information on efficient cultivation techniques and input use can be delivered through multiple mechanisms:

- *Input suppliers* can embed advisory and extension services on the right fertilizer or other chemical to apply and the right amount and proper application method.
- *ICT-based information access* could provide farmers a one-stop shop for information on basic farming techniques and farm management practices.
- *Extension services* could improve training of extension officers so that they are better able to provide appropriate and accurate advisory services to farmers.

Improved access to information and materials for year-round production

As mentioned earlier, demand exists for certain crops that are new to most farmers in Fiji. To grow those crops it may be necessary to use special arrangements like hydroponics equipment or greenhouses. Subsistence and general farmers in Fiji might find this difficult and costly. However, an entrepreneur named Mr. Kashim in Lautoka, after three years of research and development, has designed a cost-effective and easy-to-manage hydroponic system and greenhouse that can be produced locally and can grow almost all kinds of leafy vegetables. The plastic nets on the hydroponic frame and perforated cloths for the greenhouse can be used for five years, but the structure can be used for more than 15 years. He also supplies the necessary nutrients for cultivation in hydroponic systems and greenhouses. The cost of one hydroponic frame that can accommodate 390 plants is FJD 4,000, which includes frame, delivery, setup, training, and the first batch of nutrients. If these frames and nutrients can be made available throughout Fiji, many farmers can grow new and specialty crops that are now being imported.

More farms and farmers can enter vegetable production and produce high-value crops to increase their profitability. Sugarcane cultivation is becoming less profitable day by day, and a number of sugarcane farmers are gradually moving to more profitable choices. For them, high-value and quick-return vegetables and fruits can be a suitable option. More importantly, subsistence farmers, through proper crop planning, can create a diverse portfolio of crops that will reduce their risk of failure, maximize profitability, and allow them to derive more income from the same small piece of land.

Introducing new crops

The introduction of new crops to Fiji is extremely difficult. MDF will focus less on introducing new crops and more on increasing the volume of crops which are grown in small scale, but which could be grown on a large scale (such as capsicum, fancy lettuces, red cabbage, and zucchini).

Meeting demand for crops in Vanua Levu

Some vegetables are not grown in sufficient quantity in Vanua Levu and are regularly imported from Viti Levu. It may be possible to grow those vegetables in enough quantity in Vanua Levu to satisfy its own demand and export to Viti Levu. There are also opportunities to cultivate crops such as cowpea and pineapple for export markets.

Chapter 3: Sector growth strategy

3.1 The strategy

Based on the constraints and opportunities described above, the following strategy can be formulated (Table 4). The goal is to increase horticulture production and agricultural exports by increasing productivity, improving quality, and promoting year-round cultivation through improved backward linkages, access to information on cultivation techniques and input use, and access to high-quality inputs.

Table 4: Sector growth strategy

Constraint area	Market to be influenced	Anticipated results if markets starts to work better	Type of potential partners	Relevance to WEE (if applicable)
(Access to) More diversified end markets (new markets, new preservation/transportation techniques)	Exporters and wholesalers are able to sell more (diversified) Fijian agricultural produce in new markets, through new modes of transportation or through new manners of processing, packaging, or preservation.	Increased exports >> more (consistent) demand and better prices for agricultural produce >> farming becomes more commercially attractive.	Exporters, wholesalers, processors, supermarkets, transporters, shipping companies	Contributes to the 5 WEE domains . It is expected that women will have equal opportunities to benefit from increased market access and improved transport linkages, jobs and skills at the processing facilities. This can result in increased income which allow women to influence decisions .
(Establish/improve) Backward linkages and private extension services	Male and female farmers have access to privately funded extension services, which help them to increase productivity.	Households know better how to farm, become more productive (higher yields, better quality, and less rejection), and earn more >> farming becomes more commercially attractive.	Exporters, wholesalers, processors, supermarkets, heat treatment facility	Contributes to all 5 WEE domains . It is expected that women will have equal opportunities to access extension services (information, skills, assets and support services) that may contribute to increased productivity and time saved at the farm level. This can result in increased income which allow women to influence decisions .
Better access to information on cultivation techniques and input use	Farmers have access to information through mobile phone applications, media coverage, leaflets, demonstrations, and other resources.	Households know better how to farm, become more productive, and earn more >> farming becomes more commercially attractive.	Exporters, wholesalers, processors, nurseries, mobile phone/ICT providers, media companies, agricultural input importers, distributors	Contributes to WEE domains 1, 3 and 5 . It is expected that women will have equal opportunities to access information , become more productive, through time saved and manage workloads through improved technology and earn additional income.

Constraint area	Market to be influenced	Anticipated results if markets starts to work better	Type of potential partners	Relevance to WEE (if applicable)
Better access to high-quality agricultural inputs	Farmers have access to appropriate and high-quality seeds, pesticides, fertilizer blends, agricultural lime, and equipment.	Households can source better quality agricultural inputs to become more productive and earn more >> farming becomes more commercially attractive.	Exporters, wholesalers, processors, nurseries, agricultural input importers and distributors, machine importers and distributors, banks	Contributes to WEE domains 1, 3 and 5 . It is expected that women will have access agricultural inputs and to job opportunities at nurseries, distributors and retailers. It is expected that women will have equal opportunities to benefit through the shared household income gained from access to improved agricultural inputs.
Access to the skills and equipment needed for year-round production	Farmers extend cultivation from one season to two (using nurseries and irrigation) or three (using cover cropping)	Households are better equipped to extend cultivation, have a more continuous revenue stream, get higher prices, and earn more >> farming becomes more commercially attractive.	Exporters, wholesalers, processors, nurseries, agricultural equipment importers, water bore drillers, suppliers of pumps, plastics, and greenhouse equipment, banks	Contributes to WEE domains 1, 3, 4 and 5 . It is expected that women will have access to skills and equipment and benefit through new knowledge and improved technologies (irrigation) to save time and better manageable workload . Year-round production can provide equal employment opportunities for female labourers to be employed during the new season(s) and earn additional income .
Introduction of new crops	Food processors, supermarkets, and wholesalers have access to new crops (e.g., capsicum, red cabbage, and zucchini); farmers have access to inputs and knowhow.	Households can grow more profitable crops and earn more >> farming becomes more commercially attractive.	Exporters, wholesalers, processors, nurseries, agricultural input companies	Contributes to WEE domains 1 and 4 . It is expected that women will have equal opportunities to benefit from increase in income via production of higher value crops and also in terms of employment at processing facilities.

Constraint area	Market to be influenced	Anticipated results if markets starts to work better	Type of potential partners	Relevance to WEE (if applicable)
Special attention area				
Agricultural risk reduction and environmentally and socially responsible business practices	Farmers have access to information or techniques that help shield yields from negative environmental impacts (e.g., covered production, wind breaks, and weather information) and do not themselves cause negative environmental impacts.	Households lose less yield and income due to negative environmental impacts >> farming becomes more commercially attractive. Households cause less environmental damage.	Exporters, wholesalers, processors, nurseries, mobile phone/ICT providers, media companies, agricultural input importers and distributors, equipment importers and distributors	Contributes to WEE domains 4 and 5 . It is expected that women will have access to information, skills and/or techniques that can help shield yields from negative environmental impacts.
Promotion of horticulture and commercial agriculture on Vanua Levu	Both male and female farmers are better connected to the main commercial centres of Fiji	Households have more income earning opportunities >> farming becomes more commercially attractive.	Exporters, wholesalers, processors, nurseries, mobile phone/ICT providers, media companies, agricultural input importers and distributors, equipment importers and distributors, shipping/transport companies	Contributes to the 5 WEE domains . It is expected that women will have equal opportunities to benefit from increased market access and improved transport linkages, jobs and skills at the processing facilities. Increased commercial farming activities and processing activities in Vanua Levu can result in increased income which can allow women to influence decisions in the household.
Cross-cutting themes				
Poverty	In principle, same as above	Small male and female farmers have additional income-earning opportunities for the reasons stated above: information, inputs, multiple seasons, access to markets.	In principle, same as above	

Constraint area	Market to be influenced	Anticipated results if markets starts to work better	Type of potential partners	Relevance to WEE (if applicable)
Gender	In principle, same as above	Women are an integral part of farming households but rarely get access to information, skills and opportunities and markets that would help increase productivity of the household. Women have better access to markets, skills, better earnings from farming activities and/or additional employment opportunities.	In principle, same as above	
Disability	In principle, same as above	Opportunities are identified on a case-by-case basis in those areas where additional employment is created.	In principle, same as above	

3.2 Relevance for pro-poor growth

MDF's goal is to create additional employment and income for poor women and men in rural and urban areas through sustainable and broad-based pro-poor growth. Understanding poverty and gender roles, and, in the case of Fiji, ethnic roles, within the sectors where MDF works is integral to this goal. By understanding who is poor and why, MDF can better identify opportunities for equitable growth that are relevant for these low-income producers, workers, and consumers.

Thus, pro-poor results are defined, and will be measured, as follows:

- In those intervention areas where results are defined as increasing the number of horticultural male and female farmers or increasing production for existing male and female farmers: additional male and female employment created as a result of additional income from the horticulture sector.
- In those intervention areas where results are defined as additional sales to the horticulture sector: additional income generated for male and female farmers and additional employment created along the value chain (input suppliers and their distributors, wholesalers, transporters/shipping companies, HTFA facilities, and exporters).

Opportunities will also be identified to generate additional employment and income-earning opportunities in relatively poor and economically less developed areas such as Vanua Levu.

3.3 Relevance for cross-cutting themes

Women's economic empowerment (WEE)

Agriculture is still regarded as the single biggest employment- and income-generating activity in Fiji. The economically active labour population in Fiji in 2009 was 354,260, of which the agriculture sector alone directly employed 61,640 males (17%) and 14,400 females (4%). This means that the agriculture sector can be an important avenue for Fijian women and girls to develop themselves and take control of their lives. Increased demand for horticultural crops from the export market continues to make this avenue broader and more diverse.

In 2013, the Fiji Poverty, Gender and Ethnicity study was conducted for the horticulture and agro-exports sector. It also examined the two large ethnic groups (Native Fijians and Indo-Fijian) and noted that decision making was equally shared between men and women in the households. There was a significant difference around women's mobility and being engaged in casual farm labor outside the family's farming unit.

The understanding around women's economic empowerment is being integrated into MDF's management cycle which addresses five thematic areas of WEE. MDF has chosen to focus on WEE as a means to contribute towards gender equality in the sectors that MDF is involved in. The five thematic areas are summarised below and will be explained in further detail in the gender technical paper. The five thematic areas on women's economic empowerment include:

1. Economic advancement – do women have access and agency?
2. Decision making – do women have freedom and authority over household income, workload and access?
3. Workloads – can women manage additional work? Can women's workloads be more efficient/decreased?
4. Access to opportunities – do women have access to jobs and skills?
5. Access to assets, services – do women have access to assets, services and other supports?

The majority of women in the horticulture sector work in two main areas, either at the cultivation end, or at the business end (input supplier or sourcing). Generally women working at the farm level either work full-part time (farm owners), or on a part time or casual basis where they are either laborers (own farm or neighbouring farms) or business staff. While generally the horticulture sector tends to be ethnicity indifferent, in terms of farm laborers, Native Fijian women are more predisposed to work on neighboring or further away farms than their Indo-Fijian counterparts. Other than this, women of the two main ethnicities tend to play more dominant roles with respect to different crops.

It is difficult to generalise on whether women in horticulture can take on more activities. Processing facility workers perhaps are more able to do this, especially where the facility is not in operation all week long, and the same can be said of sourcing agents. These women can opt to take on additional working hours, or tend to their own small-farms themselves on other days. Female farmers tend to be occupied with either farm duties or household obligations (in terms of having free days), whereas female laborers tend to be employed on a casual basis when they are not already occupied with other income earning / family activities. Thus, results relevant for women's economic empowerment are defined, and will be measured, as follows:

- In those intervention areas where results are defined as increasing the number of farmers who switch from other crops to horticulture or increasing production for existing farmers: the

additional female employment created as a result of additional income from the horticulture sector.

- In those intervention areas where results are defined as additional sales to the horticulture sector: additional income generation for farmers and additional employment creation along the value chain (input suppliers and their distributors, wholesalers, transporters/shipping companies, HTFA facilities, and exporters) disaggregated by gender.

Opportunities do exist to increase the productivity of women in horticulture by either enhancing the ease of their core tasks, or through transfer of the necessary techniques and know-how. However these approaches are not so straightforward. Tools or techniques that ease family farming labour will need to be approached in a way that keeps the average woman's physical limitations in mind. Provision of advice (house visits) needs to specifically target women when they are the primary actor in that particular market system for example, the fruit pickers or the virgin coconut oil producers. Generally women are involved as market actors in different points within the market system and they are of all age groups. Women engaged in part-time or casual farm labour tend to be lower than middle aged. In agri-businesses, the exporters tend to have a large female employment base at the processing centres.

Opportunities to work with such businesses to introduce transportation services, child-care facilities on-site (e.g. child minding area with attendants or afterschool care) to ensure that women are able to work the standard or increased hours and manage their domestic responsibilities as well. This would particularly make sense where the facility finds it difficult to increase production to meet increased demand (e.g. per week) because they only have access to a limited number of woman-hours. Where women are the primary suppliers, in order to increase the regularity and volume of supply, the businesses can introduce measures that make their tasks easier, and thus incentivize them to engage in this activity more consistently, for example fruit-picking tools. Where the women are the farm owners and/or primary farmers but are not necessarily the head of the household, any interaction with the farmer / household in advice provision (e.g. extension advice) or relationship building needs to be mindful of the fact that there will need to be interaction in detail with both parties, and probably again separately with the female to ensure that the knowledge transfer occurs effectively.

Opportunities will be identified to generate additional female employment and income-earning opportunities in relatively poor and economically less developed areas such as Vanua Levu. In addition, some supply chains leading to the tourism and export markets are particularly relevant for female employment opportunities, such as seedbed preparation and planting for nurseries; grading, processing, and packing for export; and employment with input suppliers.

Environmentally and socially responsible business practices

In agriculture, access to high-quality inputs such as seeds, fertilizers, crop protection chemicals, and agricultural lime is a major challenge. Extension services and other information on good farming practices and pest and disease control measures are also hard to find. The excessive use of fertilizer and other chemicals not only has diminished the soil quality and decreased soil pH level overtime but also has an adverse effect on environmental conditions.

In horticulture and among related support service providers and input suppliers, there are opportunities to introduce better land and farm management practices and pest and disease control measures. Bridging the current information gap and improving the availability of high-quality agricultural inputs will increase farm productivity and decrease hazardous environmental impacts.

Disability

There may be limited opportunities to create opportunities relevant for people with a disability. However, where this seems feasible, it will be supported.