PARDI2

Digitization of internal control systems for kava

FijiKava

TRASEABLE SOLUTIONS

pacific farmer organisations

Australian Centre for International Agricultural Research

Background

- PARDI2 – Pacific Agribusiness Research in Development Initiative 2 (ACIAR funded project)
- OVERARCHING AIM PARDI2: To identify and understand how agribusiness development opportunities can contribute to improved economic growth and livelihoods in the Pacific (Fiji, Tonga and Vanuatu)
- Research tools for agribusiness researchers; Value Chain strengthening; Capacity Building










BACKGROUND

- Fiji's population approx. 865,000, 49% in rural areas; agriculture for income and employment. Majority of farmers here either semi-commercial/subsistence farmers.
- Much change for Fiji kava and kava products over last 20 years. Late 1990s strong demand for medicinal and pharmaceutical kava in Europe - "kava boom", export sales many times greater than current levels.
- Boom ended - claims of liver damage to a few patients in Germany due to kava toxicity. 2001 Germany placed banned on kava and its products.
- Kava-producing countries of the Pacific, stakeholders, including EU, assistance from PROINVEST3 for funding to rebut claim. Claim on liver toxicity cleared by WHO, ban lifted in 2015. However, exports to EU not resumed to any significant level, need for great quality control.
- Analysis of the kava value chain (PHAMA): **confirms that kava is one of Fiji's most important agricultural commodities.**

- Current kava market, very different, largest amount of kava being traded with and between the PICs, for beverages (social and relaxation), outside the region kava has both beverage and medicinal/ pharmaceutical use (herbal meds, an alternative to pharmaceutical sleeping and anti-anxiety medication).

- US market is considered to have good growth potential with a number of new kava bars offering high prices for good quality kava.
- Although domestic market dominates, kava exports still important source of revenue for Fiji relative to other agricultural export commodities. One of most important cash crops in some rural areas, employing large numbers of people in harvesting, processing and retail operations.
- Over last decade, Fiji's kava exports = av. 218 tonnes/annum = FJD6.6 million. Exports grew steadily from 2007 until 2012 reaching 300 tonnes/annum, but erratic since then, climatic events including droughts and cyclones.

National and Agricultural GDP and Contribution of Principal Crops (in Constant 2011 FJD millions)

	2011	2012	2013	2014	2015 (p)
National GDP	5,739	5,820	6,095	6,437	6,667
Agricultural GDP	473	465	497	500	542
Crops	221	219	246	242	287
Kava	39	54	66	68	113
Sugar cane	69	43	44	50	51
Taro	40	35	51	37	36

Source: Fiji Bureau of Statistics and MoA; p = provisional

Product	Description	Retail Prices (FJD/kg)
Waka	Dried roots	100-150
Lewena	Dried rhizome	80-120
Pounded waka	Powder	80-100
Pounded lewena	Powder	70-80
Lewena kasa	Cut pieces	60-70
White kasa	Stem	25-30
Black kasa	Stem	20-25
Civicivi	Peelings	15-20

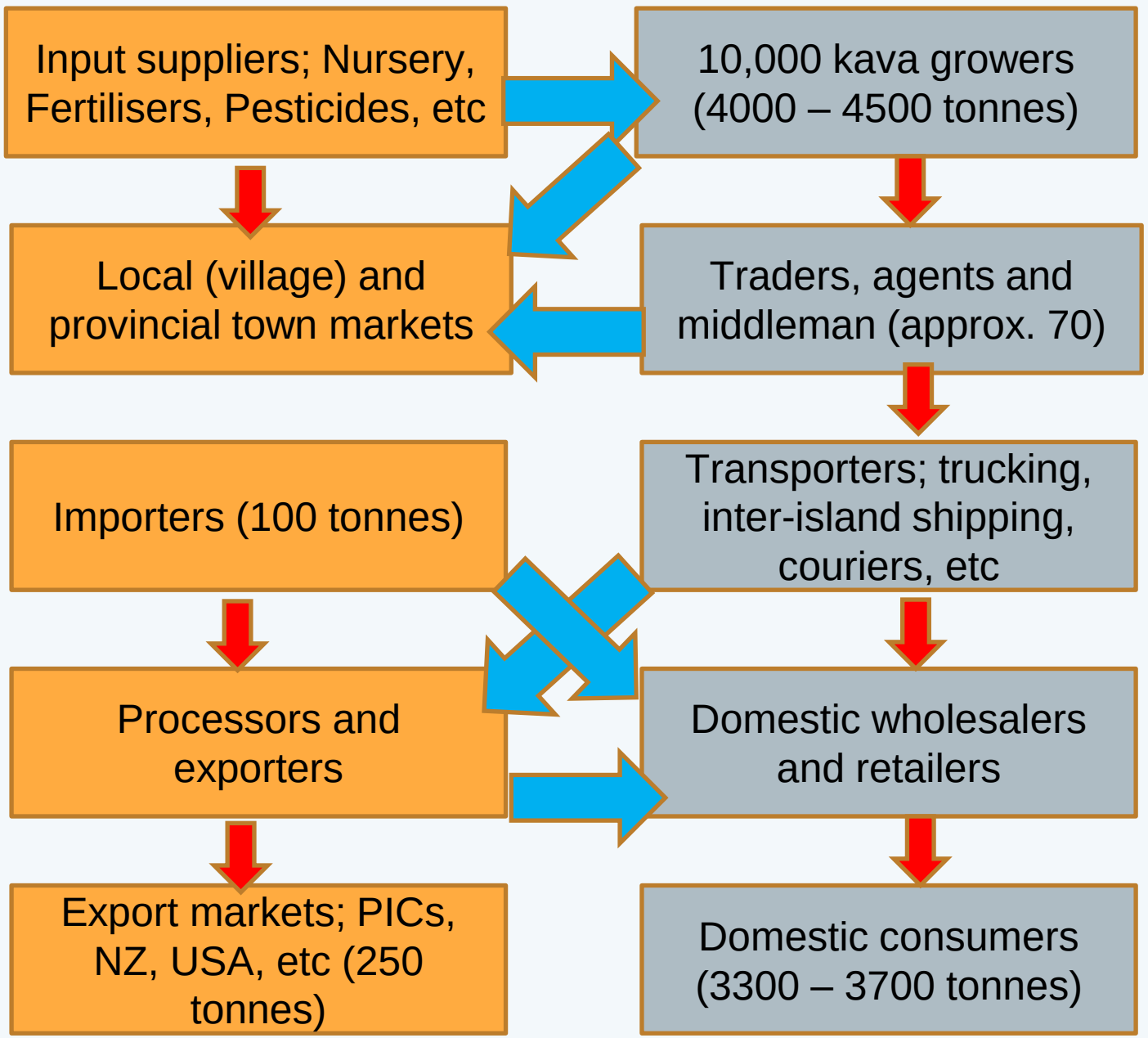
(**PHAMA, 2018**)

No. of kava growers	10,400 (1 in 8 rural households)
Area of crop	4,000 - 5,000 hectares
Area harvested annually	1,000 - 2,000 hectares
Yield	2.6 - 2.8 tonnes/ha harvested
Kava produced	4,000 - 4,500 tonnes dry weight, farmgate
Imports	100 tonnes dry weight
Exports	250 tonnes dry weight
Shrinkage, wastage and losses	600-650 tonnes dry weight
Domestic consumption	3,300 - 3,700 tonnes dry weight

(**PHAMA, 2018**)

- Despite fluctuating export volumes, value of kava exports has grown strongly due to price increases and reached a record FJD14.2 million in 2016.

MAJOR MARKETING PATHWAYS FOR FIJI KAVA



International and Support services: MOA, MOT, FCLC, BAF, Research and Financial Institutions

(**PHAMA, 2018**)

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- Majority of Fiji's kava farmers are iTaukei unmechanized smallholders, less than one hectare of mataqali land, using a combination of family and hired labour. Overall, only 2.1% of kava growers are women, more involved in nursery and maintenance.

- weight loss/wastage/shrinkage; poor control of or inadequate drying leading to mouldiness, removal of soil during rewashing, and theft. Improved postharvest management, particularly washing and drying at village level, critical.

- Biggest problem by processors and exporters = quality of kava received; not properly washed and dried. Rewash and re-dry, time and money, incurs weight losses of 15-20%.

- Establishment of systems for certified organic kava in cases where price premiums are available and sufficient to cover the costs associated with organic certification. Interest from farmers.

- PHAMA = survey of kava production, the kava quality manual, support for the Kava Task Force, the kava standards, proposed development of regulations to accompany the Kava Act.
- Indicates increased, stable and sustainable production of kava is a high priority.

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FijiKavaLtd


FijiKava
NOBLE
KAVA EXTRACT
CAPSULES
Piper methysticum ext. dry conc. 695mg from fresh root and rhizome 6.95g
AUST L 315405
30 VEGAN HARD CAPSULES


The antidote to a stressful world.
CALMS & SOOTHES
Tăki Mai
INSTANT KAVA ROOT POWDER


FijiKava
CERTIFIED FIJIAN NOBLE KAVA
NOBLE KAVA
Piper methysticum ext. dry conc. 695mg from fresh root and rhizome 6.95g
Traditionally used to induce sleep and calm & soothe the nerves
30 Vegan Capsules


FijiKava
CERTIFIED FIJIAN NOBLE KAVA
NOBLE
SLEEP
Traditionally used to induce sleep and relieve sleeplessness
30 Vegan Capsules


FijiKava
CERTIFIED FIJIAN NOBLE KAVA
NOBLE
BODY
Traditionally used to maintain and support body and muscle relaxation
30 Vegan Capsules

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WHAT IS AN INTERNAL CONTROL SYSTEM?

In our case the aim of the ICS is to ensure compliance by kava suppliers to the organic standard (3rd party) that Fiji Kava uses for export requirements to its various markets.

Why Digitalization in Agribusiness?

PROS	CONS
Safe (for e,g cashless transactions)	Can be expensive
Increase productivity of business	Requires technical expertise and assistance in establishment
Increase efficiency of operations	Risk of losing data (Hard copy backup)
Saves time, energy and where applicable operation costs.	Not easy to learn in the beginning, fast-paced changes. “Digital-divide”
Provides real-time information on weather and crop calendars, livestock/crop care, markets, and nutrition-related aspects of food production. Shifts power and moves info.	Data use and privacy issues. Mistrust can arise from service providers and certain technologies. Can cause work displacement. Requires supportive infrastructure.

AIM

- To determine the requirements for digitizing operations, as a pathway towards meeting 3rd party organic standards for kava.

OBJECTIVES

- Understand the position of farmers in digitizing their operations
- Requirements towards digitizing operations for a local kava agribusiness
- Begin a checklist for agribusinesses considering to digitize their own operations.

Method

- Interviewed a selection of kava farmers on Ovalau (n=12) identified as regular suppliers to Fiji Kava.
- Questions:
  - Farm description and operations
  - Farm experience and training
  - Challenges, risks and mitigation
  - Economic activities and opportunities
  - Farmer cluster/group involvement
  - Digital/Technology activities
  - Future Plans










Methodology – FEASIBILITY STUDY. (How practical would it be to establish the digitization of an ICS?)

Data collection for feasibility assessment conducted in two parts.

Farmer Survey

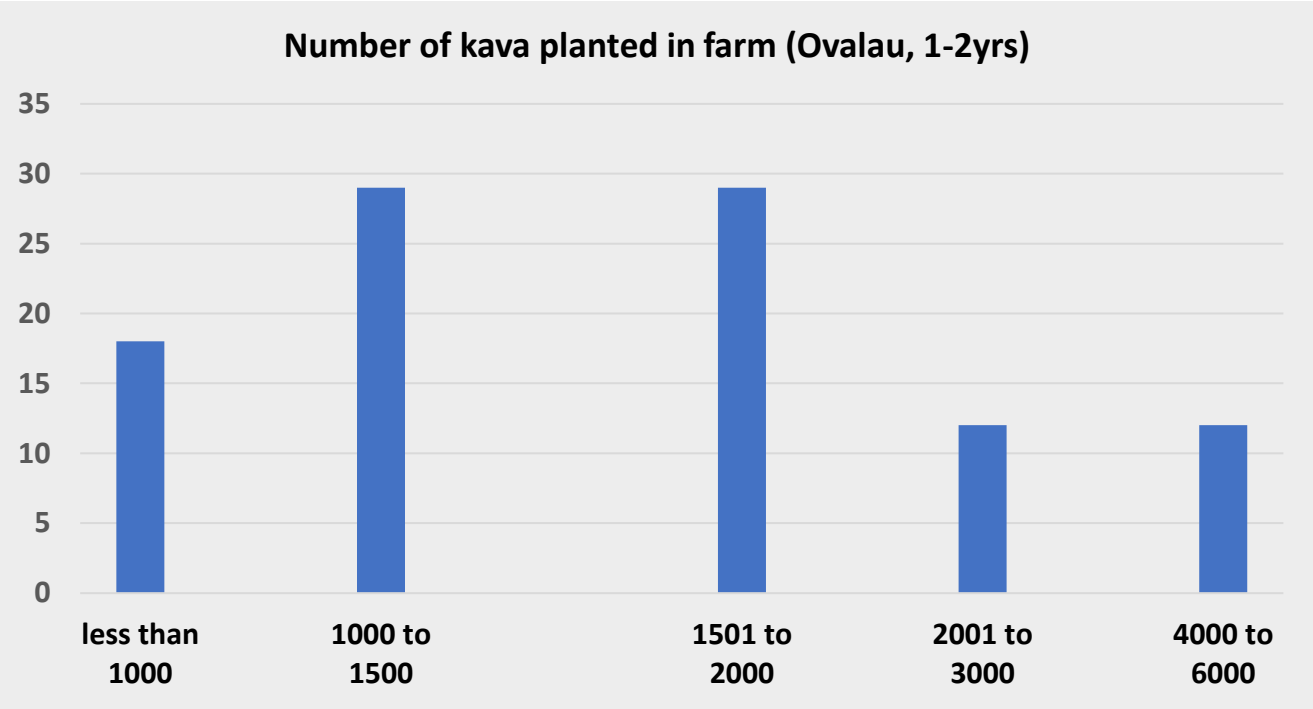
SPE provided a list of farmers they sourced from Vanua Levu. Farmers were contacted and interviewed by phone.

The objectives of the survey were to understand the lead farmers:

1. Farming operations
2. Production and economic activities
3. Ability and interest to use a digital tool as a requirement for supplying kava to SPE

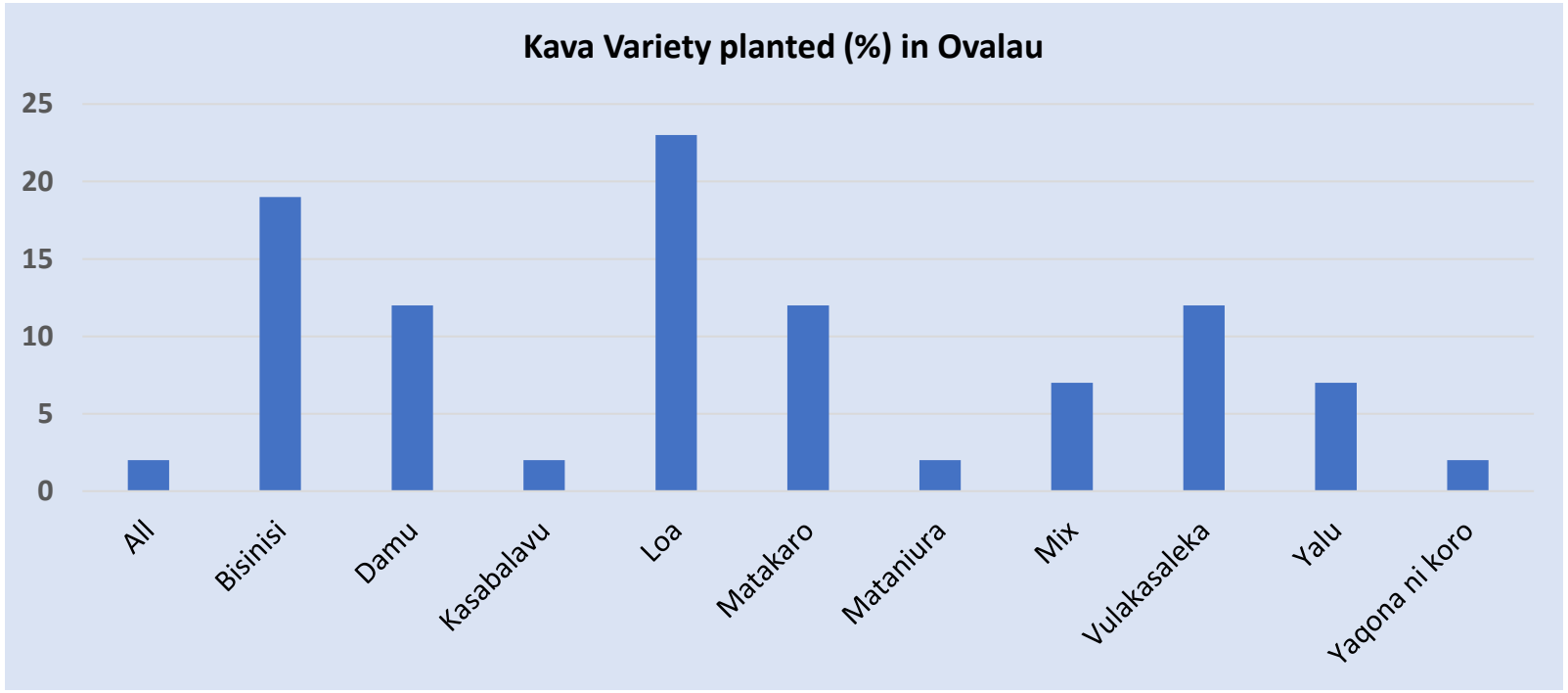
Results and Discussion – Kava Farmers and digitalization of their operations

- 25 farmers in total (13 in Ovalau, 12 in Vanua Levu)
- All male, ranging in age from mid 29-73, 54% largely between 20-50 in Ovalau and 69% above the age of 46 in Vanua Levu



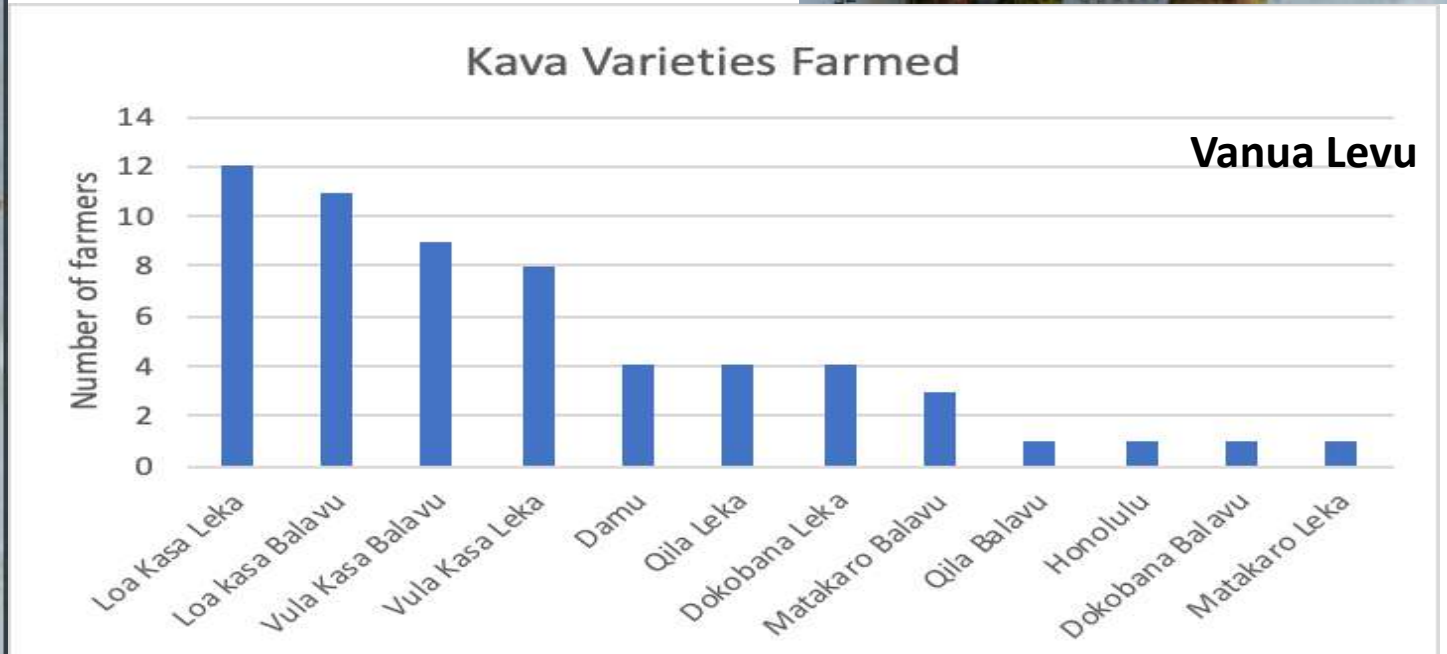
Vanua Levu

Planting/harvest Period	Farmers Planting (%)	Farmers Harvesting %	Quantity (kg)
daily	8		
weekly	8	8	20
Fortnightly	8	8	60
Monthly	8	23	10 to 35
3-6 months	42	62	20-1000
6-12 months	25		


Kava Variety planted (%) in Ovalau
25
20
15
10
5
0
All
Bisinisi
Damu
Kasabalavu
Loa
Matakaro
Mataniura
Mix
Vulakasaleka
Yalu
Yaqona ni koro


MATAKARO LEKA


VULA KASA LEKA


Kava Varieties Farmed
Vanua Levu
Number of farmers
14
12
10
8
6
4
2
0
Loa Kasa Leka
Loa kasa Balavu
Vula Kasa Balavu
Vula Kasa Leka
Damu
Qila Leka
Dokobana Leka
Matakaro Balavu
Qila Balavu
Honolulu
Dokobana Balavu
Matakaro Leka

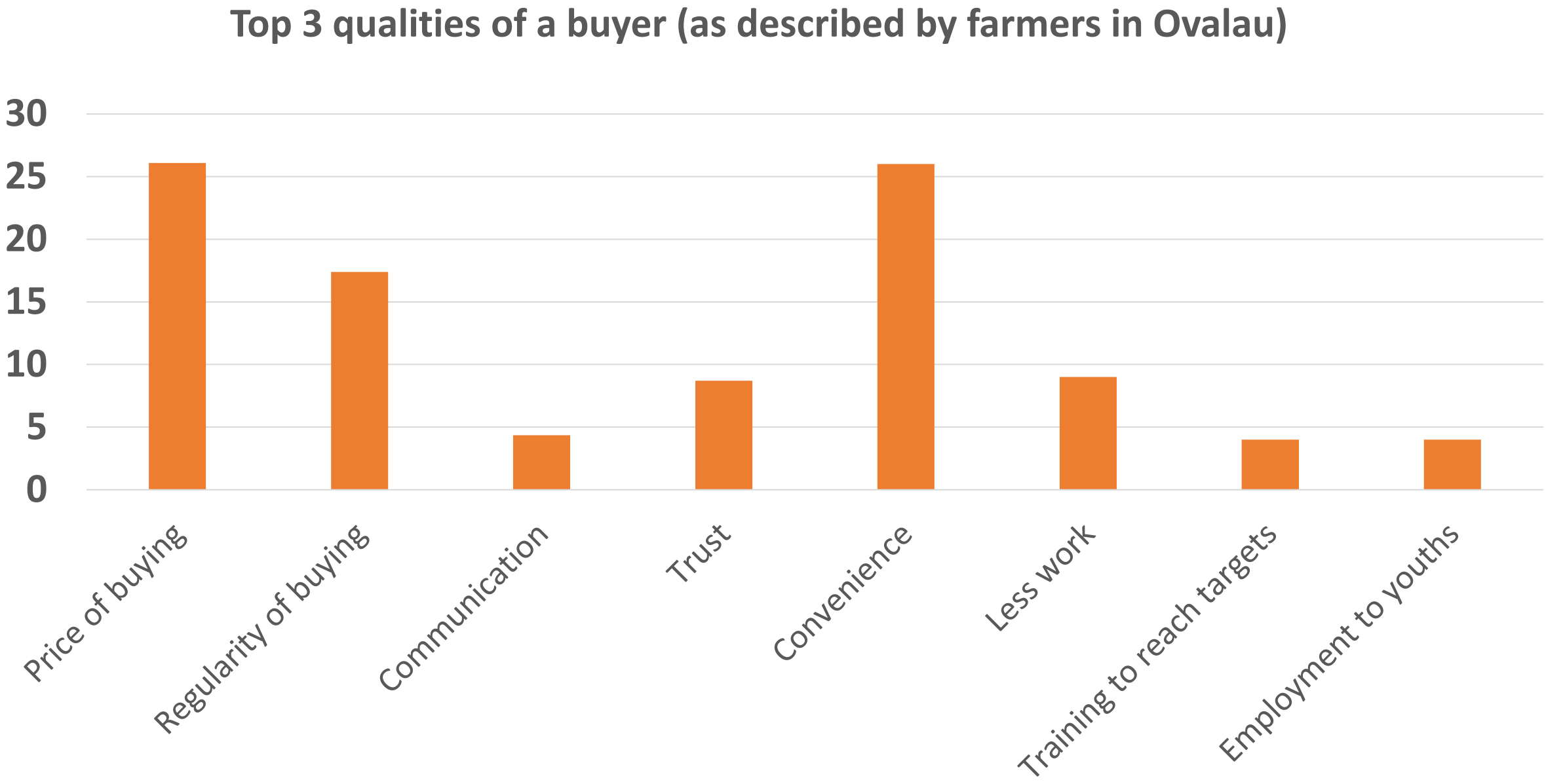
- 61% (Ovalau) to 100% (Vanua Levu) of farmers source their own kava cuttings for replanting.

Vanua Levu

workforce	Min	Max	Average	% Youth	% Women
Nursery	0	10	4	80	20
Land Preparation	1	35	12	94	7
Grow Out	2	35	9	85	8
Harvest/Post Harvest	3	35	12	92	0.6
*Sale **	0	3	0.3	75	0
overall	0	35	8	90	6
*Sale Note**	62% of farmers, do not hire additional help for sale of kava. They and wives sell themselves.				

Ovalau

Activity	**% Kava Farmers**
Plants own kava	59%
Maintains kava farm himself	59%
Harvests kava himself	50%
Employ others on the farm	83%


Top 3 qualities of a buyer (as described by farmers in Ovalau)
30
25
20
15
10
5
0
Price of buying
Regularity of buying
Communication
Trust
Convenience
Less work
Training to reach targets
Employment to youths

Digital Literacy – Farmers in Vanua Levu

MEASURE	%
Own a smartphone	54%; (64% in Ovalau)
Confident in using a smartphone	31%
Not confident in using smartphone	38%
Android phone user (less than 3 years old)	86%
Iphone user (more than 3 years old)	14%
FB account	77% (Vanua Levu); 36% (Ovalau)
CONNECTIVITY AND INTERNET SERVICE (Vanua Levu)*	
Excellent	25%
Average	42%
Poor	25%

*54% of farmers have direct access to internet, remaining have intermittent access or can only access when close to Labasa

What would farmers use an app for?

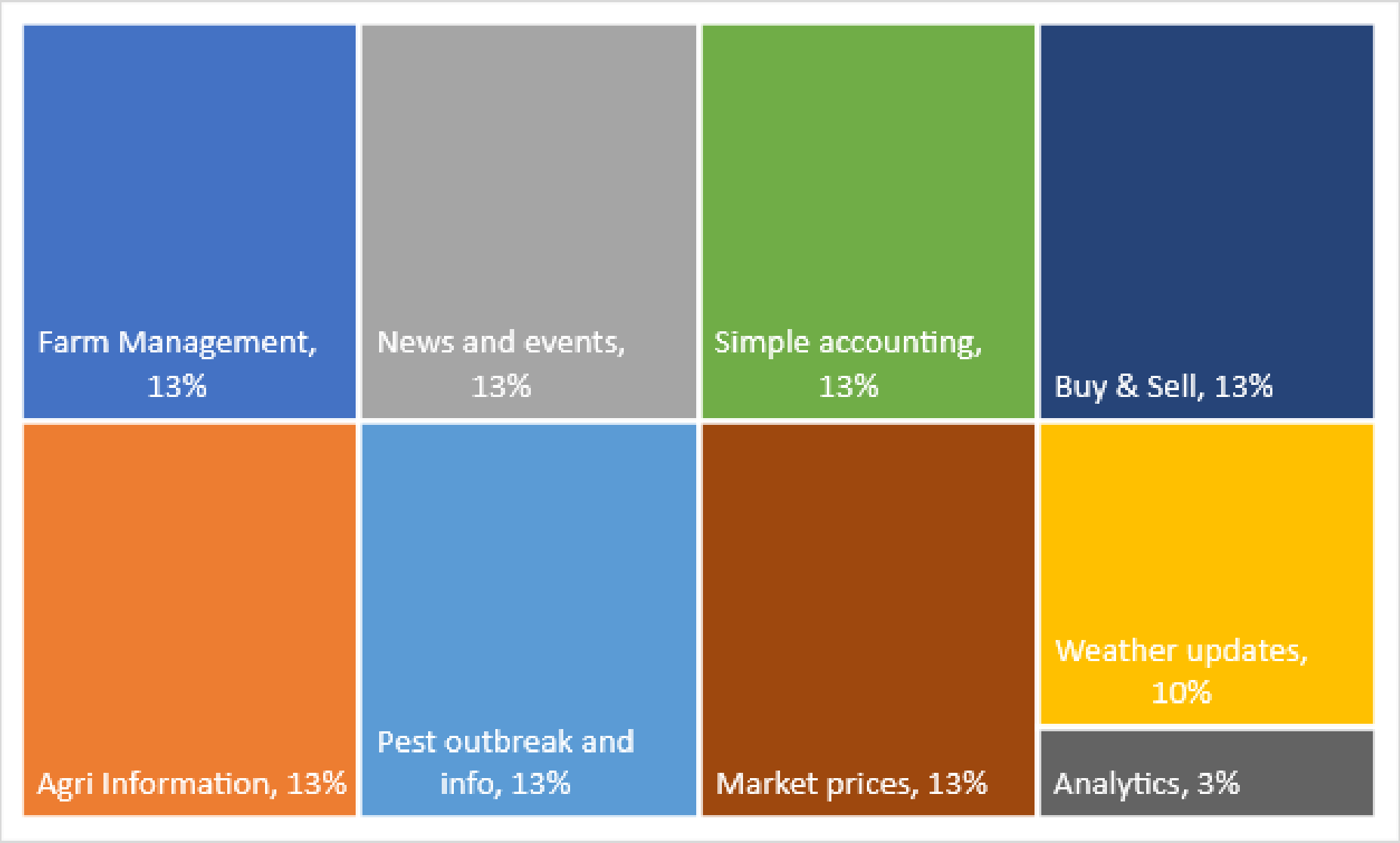


Figure 4. Cumulative ranking of app tool importance

- 46% would adopt app if required by buyer
- 15% depend on the time spent and ease of app
- 31%, buyer has no influence over their use of an app

Utilisation of smartphone

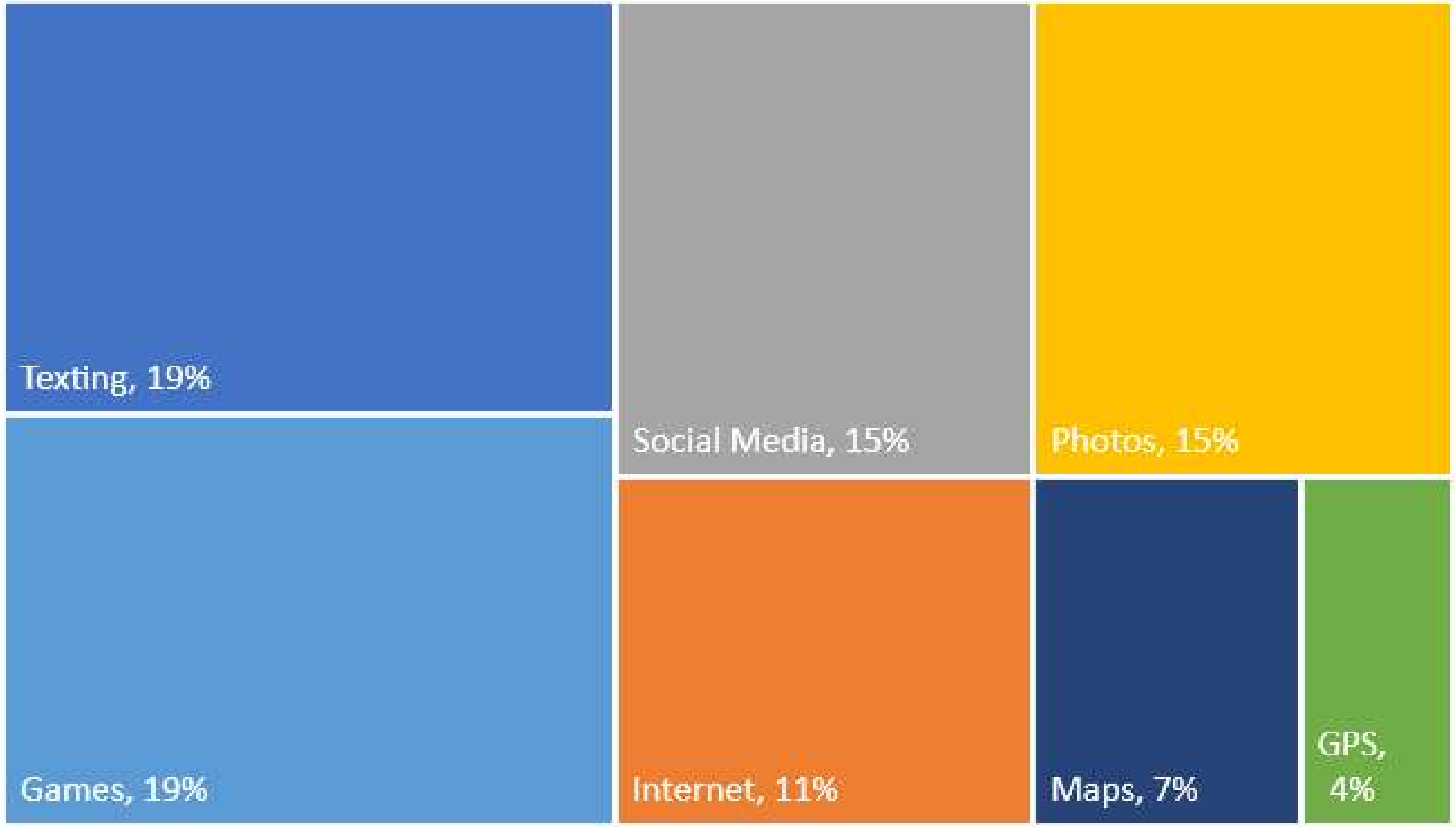
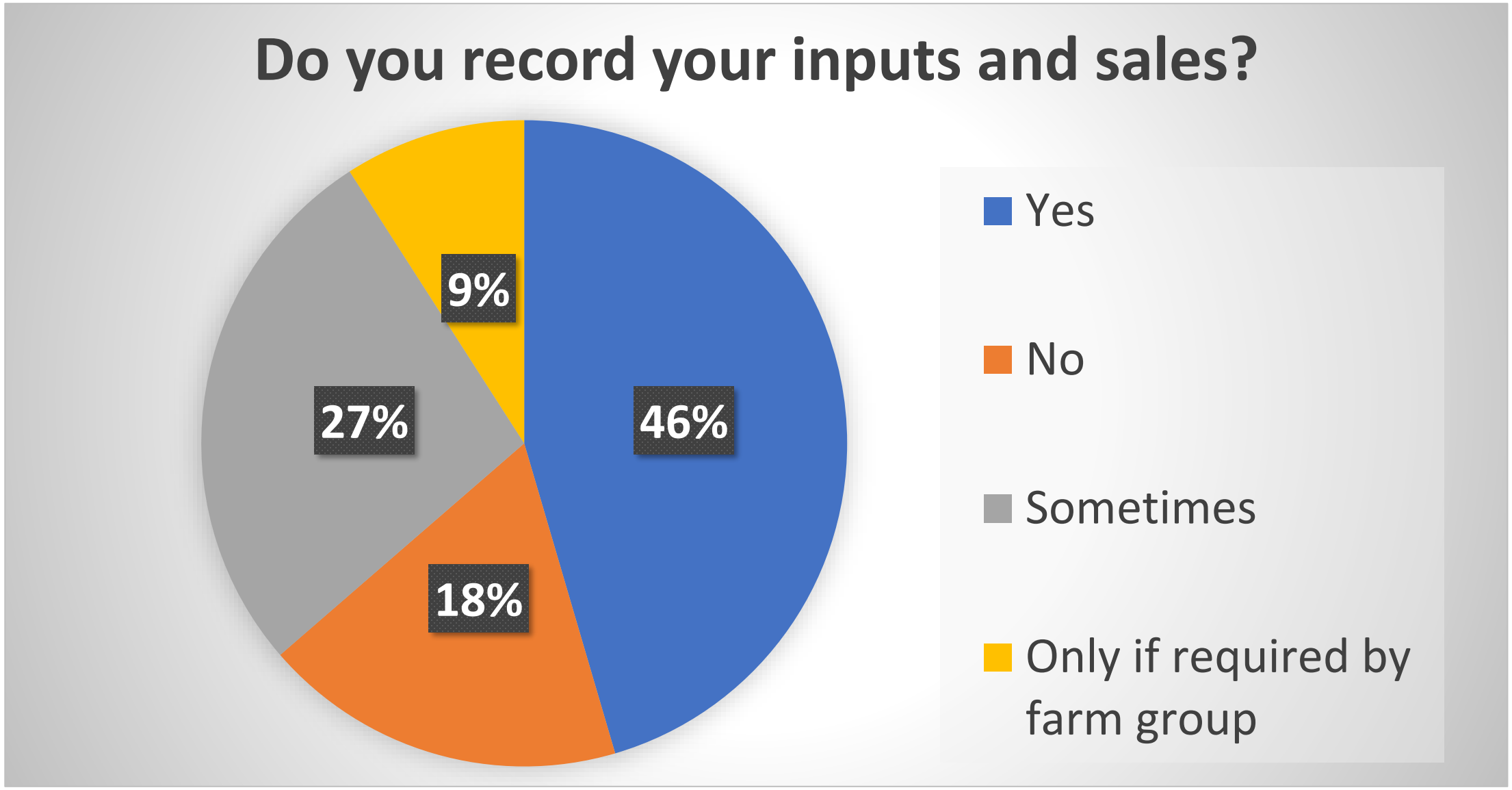


Figure 3. Cumulative percent of regular smartphone activities reported by lead farmers.

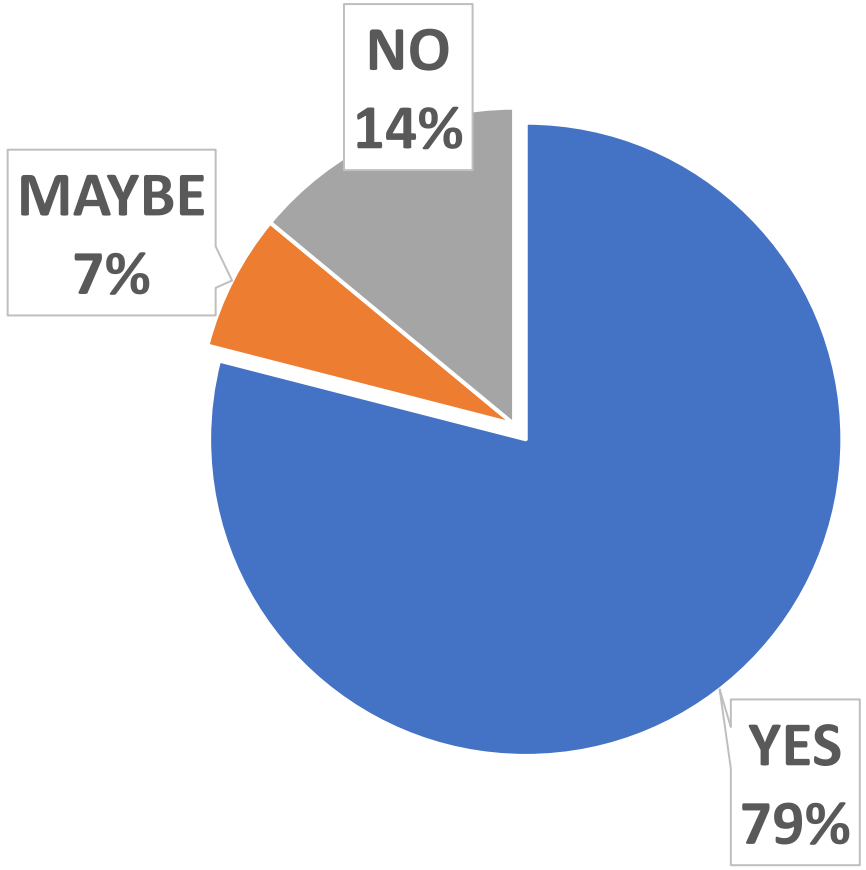
- Facebook most accessed app (77%)
- One farmer utilized an online banking app
- Challenge: cost of an appropriate phone for app use
- Cost of recharge ($7-$80/month)

Record Keeping - Ovalau

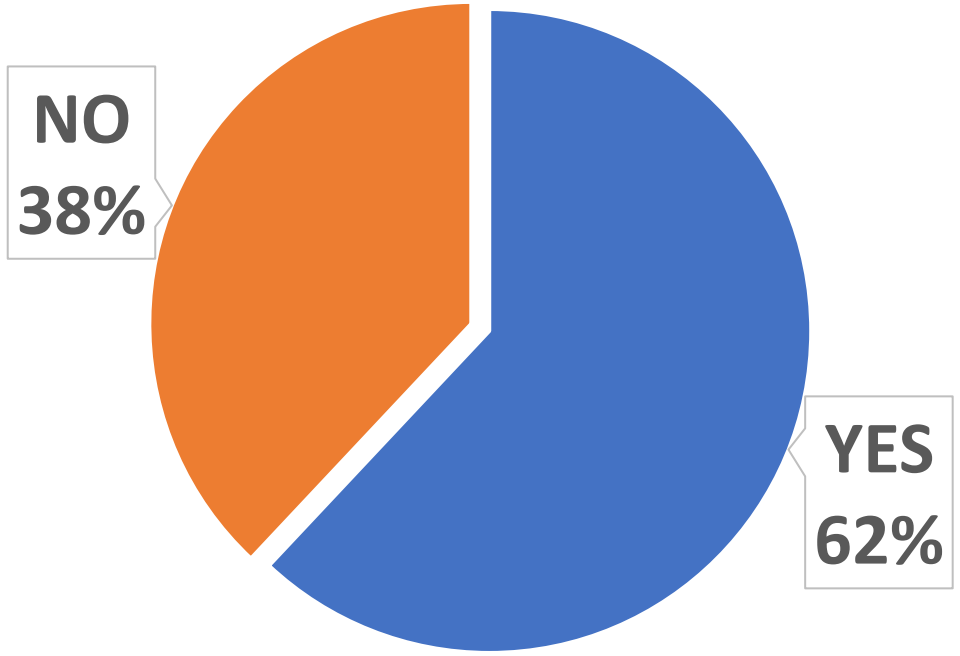


Record Keeping – Vanua Levu

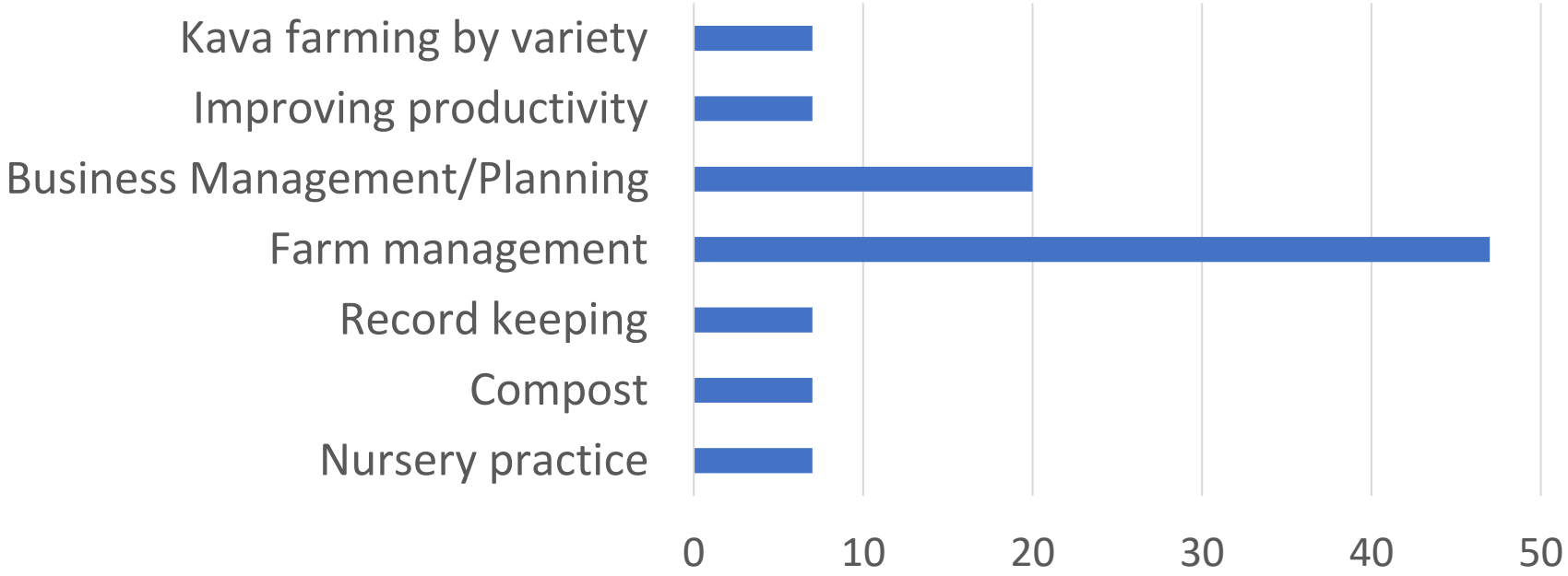
Think that record keeping is important



Actually keep records



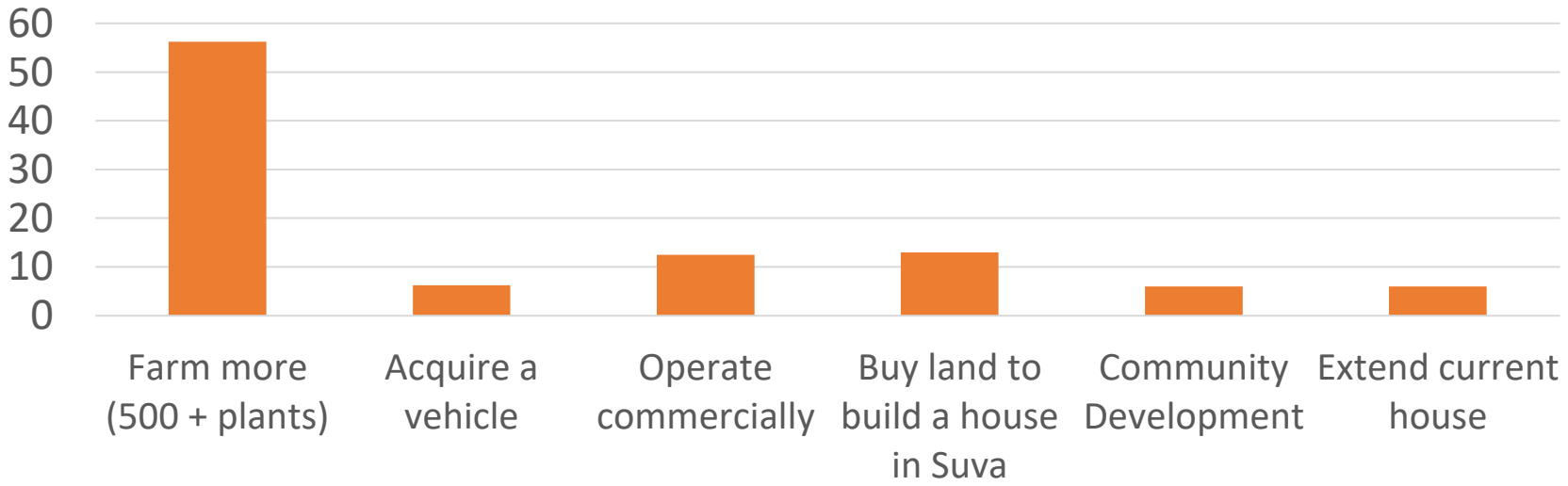
Specific training farmers requested (Ovalau)



- Farm/Business Management and Planning were popular areas of training requested

- Most farmers do want to plant more kava but with a very specific end goal. Mostly related to family and community security.

Future plans (next 5 years)



Results and Discussion - Requirements towards digitizing operations for a local kava agribusiness

Components of Proposed Digital Solution

Mobile app - Used for data collection in the field and for access to information delivered through the app

Web-based database application - a centralised repository for all mobile app data and can offer additional functionalities

Application Programming Interface (API) - provides data services between the app and the web-based database application

Implementation Options

Based on the findings of the farmer survey and assessment of SPE's operations and data needs, options are:

1. **Farmers use an app** - Custom-built to fit purpose or use an existing app. Burden of organic certification compliance and recordkeeping is on the farmers.
2. **SPE use an app** - Custom-built for SPE's purposes to manage the ICS data. Lower development and implementation costs and SPE would be in control of the quality and accuracy of its ICS data.
3. **Maintain the Status Quo** - Implement a manual recordkeeping system to operationalize the ICS. Farmers maintain their own records and SPE staff to verify during their inspections.

RECOMMENDATIONS

1. Mobile App developed for SPE/Fiji Kava

- achieve the needed levels of compliance towards organic standard, not be a limiting factor to extending their pool of lead farmers. F**ull control of the data** needed for compliance and will be in regular contact with farmers.

2. SPE/Fiji Kava to re-look into organization-wide management of its information system. (enhance operational efficiency, may reduce operational costs, helps with own compliance)

3. Trial TraSeable Farms app with farmers, have shown interest in using an app, (1) year period. (Can yield useful results to better understand how farmers can use an app on their farm for record-keeping. Support available from TraSeable team to train farmers on digital recordkeeping).

Results and Discussion - checklist for agribusinesses considering to digitize their own operations

CHECKLIST – FROM FARMERS END
Understands the importance of regular and appropriate record keeping; its organization, management and use
Have an appropriate smartphone (can support apps)
Can use a smart phone confidently (such as downloading apps and using them)
Farmers have regular training and support to use their digital tool (ideally by their buyer)
Connectivity in their area
Farmer and buyer relationship is established, developed and strengthened over time (Trust)

User Needs Assessment – What would a mobile app for a kava farmer look like?

Based on all this information, the farmer app should have the following characteristics:

1) **Android first** – built for Android Operating System devices first because of their affordability and prevalence in the market.
2) **Data efficient** – the app, integrated database, and API should use efficient data processing and transmission techniques to be optimised for low-bandwidth usage.
3) **Offline capable** – recordkeeping features of the app and technical content will have to be available in an offline mode where data is stored on the mobile device.
4) **Efficient synchronisation** – stored data in the app will need to be efficiently synchronised, in terms of bandwidth and processing time, with the web-based database to avoid any data losses.
5) **Good usability** – employ human-centred design principles that account for the digital literacy of farmers in the design of the app.
6) **Translations** – iTaukei translations in the app will be necessary to utilise the app and improve engagement from farmers.
7) **Help cues** – Have good in-app help cues that the farmer can understand. Push notifications and in-app alerts can also be utilised to improve the farmers ability to use the app and to maintain the quality of the data they are recording.

User Needs Assessment - What would a mobile app designed for a kava agribusiness look like?

- It would need to be based closely on the needs of the developed ICS protocols and can involve sections on:
  - Registration
  - Inspections
  - Trainings
  - Visits
- The app can be an alternative instead of farmers maintaining their own records, the buyer/extension staff could use the app during farm visits to collect required data.
- Additional features may also include the broader Management Information System (MIS) of internal operations.

Checklist for agribusinesses considering to digitize their own operations

CHECKLIST – FROM AGRIBUSINESS END
Assessment of the capabilities of internal and external staff/suppliers to digitize methods
Supportive infrastructure within the areas of operation (e.g connectivity, devices, electricity sources, etc)
Assessment of current information systems and feasibility of moving to digital forms
Prioritisation of this strategy? Build strong connection between digitization and goals
Support from relevant digital service providers
Development of digital operations and best practices guide internally e.g digitization team
Keep internal and external informed, updated and trained

Conclusion

- Kava industry can be assisted greatly through relevant digitization.
- Digitization begins with reliable records/data, it is crucial for both farmers and agribusiness to record, manage, organise and update their information/data
- More farmers need to be made aware of the significance of proper records and data to strengthen their own farming business and management.
- Utilize checklists
- Potential to develop national digital agriculture strategy (promote digital infrastructure, improve digital literacy among farmers, policies). E-agriculture strategy guide (FAO and ITU).

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NAOMI'S KAVA
BEST QUALITY KAVA FROM JOMA KADAVU
JOMA
KADAVU