

The background is a solid light green color. In the corners, there are decorative elements consisting of thin, light blue lines that resemble circuit traces or a stylized map of Kiribati. These lines are connected to small circles, some of which are also light blue. The lines are more dense in the top-left and bottom-left corners and more sparse in the top-right and bottom-right corners.

# KIRIBATI ATOLL SOIL HEALTH PROJECT

ROUTAN TONGAIABA & KABUATI NAKABUTA

# OUTLINE

- Research activities
- Impacts: Extension and outreach
  - ☐ Crop evaluation
  - ☐ Soil and water
  - ☐ Update on factsheet distribution and translation
  - ☐ Wicking base system
  - ☐ Agribusiness – Abaiang and Village Markets

# BACKGROUND

- ACIAR funded project- SPC implementing, MELAD/ALD leading
- Started in 2015 - 2019
- Pilot islands- Abaiang, Abemama, Nonouti, Tabiteuea North, Beru
- To support Kiribati Outer Island Food and Water Project with research



Makin

Butaritari

Marakei

Abaiang

Tarawa

Maiana

Kuria

Abemama

Equator

Aranuka

Nonouti

Beru

Nikunau

Tabiteuea

Onotoa

Tamana

Arorae

PROJECT SITES



# OBJECTIVE 1: INCREASE THE SUSTAINABILITY AND PRODUCTIVITY OF STARCHY STAPLE FOOD PRODUCTION SYSTEMS.

## Activity 1.2 Evaluation of the available materials in the outer islands

- Using crop descriptors from SPC, characterisation of selected crops (2020)





# CASSAVA

## GREEN



Height(cm); **180**  
 Plant Type; **Cylindrical**  
 Number of Branching Level; **One Level**  
 Branching Angle; **45-60°**  
 Height of 1st Apical branch(cm); **48**  
 Number of Leaf Lobes; **9 lobes**  
 Color of 1st fully expanded leaf; **Dark Green**  
 Shape of central lobe; **Lanceolate**  
 Leaf vein color; **Light green**  
 Petiole length(cm); **Long (25-30)**  
 Petiole color; **Green-purple**  
 Anthocyanin pigmentation; **Totally pigmented**  
 Angle of Petiole insertion; **75-90°**  
 Prominence of Leaf Scar; **Little prominence**  
 Pubescence of young leaves; **Intermediate**  
 Length of stipules; **Long**  
 Margins of stipules; **Entire**  
 Growth habit of young stem; **Zig-zag**  
 Stem Color; **Silver-green**

## YELLOW



Cultivar Name; **Yellow**  
 Height(cm); **225**  
 Plant Type; **Cylindrical**  
 Number of Branching Level; **No Level**  
 Branching Angle; **0**  
 Height of 1st Apical branch(cm); **45**  
 Number of Leaf Lobes; **7 lobes**  
 Color of 1st fully expanded leaf; **Light Green**  
 Shape of central lobe; **Oblanceolate**  
 Leaf vein color; **Light green**  
 Petiole length(cm); **Long (25-30)**  
 Petiole color; **Light Green/Purple**  
 Anthocyanin pigmentation; **Central part**  
 Angle of Petiole insertion; **75-90°**  
 Prominence of Leaf Scar; **Little prominence**  
 Pubescence of young leaves; **Intermediate**  
 Length of stipules; **Short**  
 Margins of stipules; **Entire**  
 Growth habit of young stem; **Zig-zag**  
 Stem Color; **Silver-green**



# SWEET POTATO

RED



General outline of the leaf; **Lobed**  
 Leaf lobes type; **Moderate**  
 Leaf lobe number; **5**  
 Shape of central leaf lobes; **Lanceolate**  
 Abaxial leaf vein pigmentation; **Purple spot in the base of the main rib**  
 Mature leaf colour; **Yellow green**  
 Immature leaf colour; **Green with purple edge**  
 Petiole length(cm); **11**  
 Petiole pigmentation; **Green with purple near leaf**  
*Notes: Too young for inflorescence and tubers at time of observation*

WHITE



General outline of the leaf; **Hestate**  
 Leaf lobes type; **Very slight**  
 Leaf lobe number; **3**  
 Shape of central leaf lobes; **Elliptic**  
 Abaxial leaf vein pigmentation; **Yellow**  
 Mature leaf colour; **Green**  
 Immature leaf colour; **Green**  
 Petiole pigmentation; **Green**  
*Notes: Too young for inflorescence and tubers at time of observation*

BANABAN



Cultivar Name; **Banaban**  
 Vine internode length(cm); **5.5**  
 Vine internode Diameter(cm); **0.6**  
 Predominant vine colour; **Green**  
 Secondary vine colour; **Green**  
 General outline of the leaf; **Reniform**  
 Leaf lobes type; **No lobes**  
 Leaf lobe number; **1**  
 Shape of central leaf lobes; **Toothed**  
 Abaxial leaf vein pigmentation; **Green**  
 Mature leaf colour; **Green**  
 Immature leaf colour; **Green**  
 Petiole length(cm); **9**  
 Petiole pigmentation; **Green**  
*Notes: Too young for inflorescence and tubers at time of observation*

PRAP



Cultivar Name; **PRAP**  
 Vine internode length(cm); **5**  
 Vine internode Diameter(cm); **0.5**  
 Predominant vine colour; **Green**  
 Secondary vine colour; **Purple**  
 General outline of the leaf; **Hestate**  
 Leaf lobes type; **Deep**  
 Leaf lobe number; **3**  
 Shape of central leaf lobes; **Lanceolate**  
 Abaxial leaf vein pigmentation; **All veins partially purple**  
 Mature leaf colour; **Green with purple edge**  
 Immature leaf colour; **Mostly purple**  
 Petiole length(cm); **5**  
 Petiole pigmentation; **Green with purple near leaf**  
*Notes: Too young for inflorescence and tubers at time of observation*



# TARO

GREEN



Variety; **GREEN**  
Span of the Plant(cm); **59**  
Plant Height(cm); **94**  
Number of Stolons; **1**  
Leaf Base Shape; **Reniform**  
Predominant Position(shape) of leaf lamina surface; **Erect - Apex down**

Leaf blade colour; **Green**  
leaf blade colour variegation; **Present**  
Type of variegation; **Stripe**  
Colour of variegation; **Yellow or yellow green**  
Leaf blade margin colour; **Yellow**  
Leaf lamina appendages; **Absent**

Leaf lamina length/width ratio; **37/23**  
Petiole junction pattern; **Absent**  
Petiole junction colour; **Absent**  
Sap colour of leaf blade tip; **Whitish (transparent)**  
Leaf main vein colour; **Green**  
Leaf main vein variegation; **Present**  
Vein Pattern; **Y pattern and extending to secondary veins**

GREEN-PURPLE



Variety; **GREEN-PURPLE**  
Span of the Plant(cm); **94**  
Plant Height(cm); **80**  
Number of Stolons; **3**  
Number of Suckers; **<10**  
Leaf Base Shape; **Sagittate**  
Predominant Position(shape) of leaf lamina surface; **Erect - Apex down**  
Leaf blade margin; **Undulate**

Leaf blade colour; **Yellow or yellow green**  
leaf blade colour variegation; **Present**  
Type of variegation; **Stripe**  
Colour of variegation; **Yellow or yellow green**

Leaf blade margin colour; **Red**  
Leaf lamina appendages; **Absent**

Leaf lamina length/width ratio; **44/31**  
Petiole junction pattern; **Small**  
Petiole junction colour; **Red**  
Sap colour of leaf blade tip; **Whitish (transparent)**  
Leaf main vein colour; **Green**  
Leaf main vein variegation; **Absent**  
Vein Pattern; **Y pattern and extending to secondary veins**

150320



Variety; **150320**  
Span of the Plant(cm); **74**  
Plant Height(cm); **106**  
Predominant Position(shape) of leaf lamina surface; **Erect - Apex down**  
Leaf blade margin; **Undulate**  
Leaf blade colour; **Green**  
leaf blade colour variegation; **Present**  
Type of variegation; **Stripe**  
Colour of variegation; **Yellow or yellow green**  
Leaf blade margin colour; **Red**  
Leaf lamina appendages; **Absent**  
Leaf lamina length/width ratio; **29/41**  
Leaf main vein variegation; **Absent**  
Vein Pattern; **Y pattern and extending to secondary veins**  
Petiole/lamina length ratio; **66/29**  
Petiole colour of top third; **Purple**  
Petiole colour of middle third; **Green**  
Petiole colour of basal third; **Light green**  
Petiole stripe; **Absent**  
Petiole basal-ring colour; **White**  
Cross-section of lower part of petiole; **Closed**  
Leaf sheath colour; **Light green**  
Leaf sheath edge colour; **Dark brown (not continuous)**  
Leaf waxiness; **Medium**



# OBJECTIVE 1: INCREASE THE SUSTAINABILITY AND PRODUCTIVITY OF STARCHY STAPLE FOOD PRODUCTION SYSTEMS.

## Activity 1.3 Multiplication of planting materials

- Promotion of selected crops (Sweet potato, taro and cassava) in outerislands





## WORKING WITH FARMERS AND COMMUNITIES





# OBJECTIVE 1: INCREASE THE SUSTAINABILITY AND PRODUCTIVITY OF STARCHY STAPLE FOOD PRODUCTION SYSTEMS.

## Activity 1.6 Water research







## BUCKET IRRIGATION & WICKING SYSTEM





# WICKING SYSTEM





# OBJECTIVE 1: INCREASE THE SUSTAINABILITY AND PRODUCTIVITY OF STARCHY STAPLE FOOD PRODUCTION SYSTEMS.

## Activity 1.7 Pests and disease research

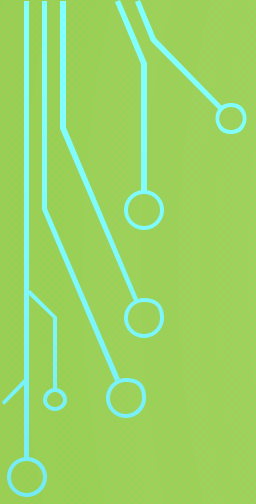
- Initial assessment identified a few pests and disease of concern
- In 2019, SPC mobilised and integrated training which resulted in the establishment of Kiribati Plant Health WhatsApp group dsupporting diagnosis and advise





The background is a solid light green color. In the four corners, there are decorative white line art elements that resemble circuit board traces or neural network connections. These lines are thin and connect to small white circles, creating a symmetrical, geometric pattern in each corner.



# CAPACITY IMPACTS – EXTENSION AND STAKEHOLDERS



# **OBJECTIVE 1: INCREASE THE SUSTAINABILITY AND PRODUCTIVITY OF STARCHY STAPLE FOOD PRODUCTION SYSTEMS.**

Activity 1.7 Production training provided to extension services and the farming communities

Given that research and extension capacity in atoll countries is poor and the importance of staff in supporting farmers, the project has undertaken a series of capacity building activities to upskill both research and extension staff as well as the farming communities.



No.	Training Subject Area	Venue & Date	Type	Trainees
1	Use of PRA tools to collect baseline data, on-farm trials, pests and disease controls and identification of mineral nutrition disorders	Kiribati 29 <sup>th</sup> February to 4 <sup>th</sup> March 2016	Workshop/training Combination of PowerPoint presentations and practical exercises.	24 Agriculture staff involved in the project (13 women) 6 IFAD staff
2	Integrated Business Model	Kiribati 17 <sup>th</sup> June 2016	Partnership and integration. Discussing how regional, international and national stakeholders should engage in food security activities	30 participants (12 females) Staff of MELAD, other government ministries and NGOs.
3	Nursery management and seedling production	Kiribati 27 <sup>th</sup> June 2016	Practical training	5 project casual in Tanaea
4	Making neem based insecticide	Kiribati 4 <sup>th</sup> October 2016	Practical	Project staff
5	Training Subject Area	Venue & Date	Type	Trainees
6	Basic agronomy of root crops and basic soil nutrient requirements of crops	Kiribati 5 <sup>th</sup> October 2016	Workshop and practical training	30 participants (8 women) Extension and research staff, NGOs, farmers

No.	Training Subject Area	Venue & Date	Type	Trainees
7	Seed saving	Kiribati 13 <sup>th</sup> October	Practical	Project staff
8	Basic agronomy of root crops	Kiritimati 22 <sup>nd</sup> November	Workshop and practical	Agriculture staff
9	Inaugural Atoll Soil Health Workshop	April 1 to 5 <sup>th</sup> 2017	Workshop, training and practicals-list these?	Project stakeholders from Kiribati, RMI, Tuvalu and invited guests from Tonga, FSM and RMI
10	Climate Smart Agriculture workshop	Kiribati 7 <sup>th</sup> and 8 <sup>th</sup> June	Workshop, training and practicals	Staff and community
11	World Soil Day	Kiribati 5 <sup>th</sup> December 2017	Workshop and celebration	Staff and farmers
12	Agricultural Assistants Refresher Training	Kiribati: 16 <sup>th</sup> – 21 <sup>st</sup> September 2019	Workshop and Practical	21 Agricultural Assistants, 2 Nurserymen
13	Agriculture Assistant and Extension Training	16 – 21 September 2019	Integrated training for extension and AAs to scale results	24 AAs and Extension Officers from outerislands. Establishment of Kiribati Plant Health WhatsApp Group

## Objective 2: Increase household and community production of local nutritious foods.

### ACTIVITY 2.1 EVALUATION OF INDIGENOUS AND INTRODUCED VEGETABLES (FACTSHEETS)

- TACKLING NCDS FROM THE GROUND UP: NUTRITIOUS LEAFY VEGETABLES TO IMPROVE NUTRITION SECURITY ON PACIFIC ATOLLS.

- |                    |  |
|--------------------|--|
| • Amaranth         | • Pumpkin and Choko                                      |
| • Chaya            | • Bele   |
| • Drumstick Tree   | • Chilli   |
| • Hedge Panax      | • Purslane   |
| • Ofenga           | • Nutritious leafy plants: Also valuable for soil health |
| • Yellow Beach Pea |  |
| • Kangkong         |  |

- A BROCHURE: MAKING COMPOST FOR HEALTHY ATOLL SOILS



# COMMUNITY/SOCIAL IMPACTS

## Activity 2.2 Training of communities (incl. women and youth)

No.	Training Subject Area	Venue & Date	Type	Trainees
1	Compost making	Tab North, Kiribati 30 <sup>th</sup> April 2016?	Workshop and practical	30 Community of Eita in Tab North
2	Compost training	Fanning 14 <sup>th</sup> November	Practical demonstration	Community
3	Compost training	Washington 17 <sup>th</sup> November	Practical demonstration	Community
4	Compost training	Kiritimati 22 <sup>nd</sup> November	Practical demonstration	Community and Agriculture staff
5	Crop production and compost making	Nonouti, Kiribati .... October, 2016	Practical training	30 community members
6	Climate Smart Agriculture workshop	Kiribati 7 <sup>th</sup> and 8 <sup>th</sup> June	Workshop, training and practicals	Staff and community
7	World Soil Day	Kiribati 5 <sup>th</sup> December 2017	Workshop and celebration	Staff and farmers
8	Compost making training	Nonouti, December 2017	Training	Growers, agriculture and community extension staff, teachers

No.	Training Subject Area	Venue & Date	Type	Trainees
9	Youth in Agriculture training	Kiribati: South Tarawa 23th March to 1 <sup>st</sup> April 2020	Workshop and Practical	48 Youths
10	Youth in Agriculture training	Kiribati: South Tarawa 11 <sup>th</sup> May to 19 <sup>th</sup> June 2020	Workshop and Practical	46 Youths
11	Youth in Agriculture training	Kiribati: South Tarawa 6 <sup>th</sup> July to 14 <sup>th</sup> August 2020	Workshop and Practical	47 Youths
12	Compost and Agronomy training	8 <sup>th</sup> – 9 <sup>th</sup> October 2020	Training and practical	15 Youths from Te Kawai ae Boou village
13	Wicking based system, Keyhole system and Leafy Vegetables Training	19 <sup>th</sup> October 2020	Workshop and practical	17 Abaiang Farmers
14	Abaiang Value Chain	21 <sup>st</sup> October	Workshop	53 AAIS Abaiang

# FACTSHEETS DISTRIBUTION AND TRANSLATION

## Activity 2.3 Media campaign on awareness raising for nutritious foods

- translation of the 13 factsheet now completed except the uploading of factsheet 1 to be uploaded very soon
- Distribution of factsheet – 3715 distributed to communities, Extension officers, youth, church groups, projects (OPPO, Koifawp, LDCF), ministries etc...
- Nutrition department & Koifawp – upgrade cooking recipes of these leafy plants and developed a booklet



No	A	B	C	D	E	F
1	No of factsheets distributed 2019 to 2020					
2						
3	Islands	Given to	No of factsheet			
4	Makin	Agricultural Assistant	130			
5	Butaritari	Agricultural Assistant	130			
6	Marakei	Agricultural Assistant	130			
7	Abaiang	Agricultural Assistant	230			
8	North Tarawa	Agricultural Assistant	130			
9	South Tarawa	Communities/schools/Ministries/youth	650			
10	Maiana	Agricultural Assistant	130			
11	Kuria	Agricultural Assistant	130			
12	Aranuka	Agricultural Assistant	130			
13	Abemama	Agricultural Assistant (Soil health Project site)	165			
14	Nonouti	Agricultural Assistant (Soil health Project site)	165			
15	Tab North	Agricultural Assistant (Soil health Project site)	165			
16	Tab South	Agricultural Assistant	130			
17	Onotoa	Agricultural Assistant	130			
18	Beru	Agricultural Assistant	130			
19	Nikunau	Agricultural Assistant	130			
20	Tamana	Agricultural Assistant	130			
21	Arorae	Agricultural Assistant	130			
22	Xmas	PAO	130			
23	Banaba	Agricultural Assistant	130			



The background is a solid light green color. In the four corners, there are abstract, stylized line art elements that resemble circuit traces or branching paths. These lines are light blue and end in small circles, creating a modern, technological feel.

# ECONOMIC IMPACTS



# OBJECTIVE 3: IDENTIFY AND DEVELOP OPPORTUNITIES FOR INTER-ISLAND TRADE IN HIGH-VALUE CROPS AND

- Abaiang interisland trade facility
- Supported the establishment of the Abaiang Agricultural Incorporated Association (AAIS) and the following:
  1. Chain links for wire fence
  2. Woodchipper for compost
  3. Nursery house for seedlings
  4. Compost house
  5. Solar power for cooling system (refrigerator)





# VILLAGE MARKETS

- Activity 2.4 Setting up village markets
  - ALD farmers days in Tanea
  - Village market days
  - WFD
  - Abaiang value chains





# SEMI-COMMERCIAL FARM IN SOUTH TARAWA





The image features a solid green background. In the four corners, there are decorative elements consisting of thin, light blue lines that branch out like circuit traces, ending in small circles. These elements are positioned in the top-left, top-right, bottom-left, and bottom-right corners.

# ENVIRONMENTAL IMPACTS







# SCALING UP OF THE PROJECT RESULTS



**MAIANA ISLAND**

