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PROMOTING DIGITAL SOLUTIONS FOR FARMERS IN REMOTE COMMUNITIES TO ADAPT TO CLIMATE CHANGE

PROMOTING DIGITAL SOLUTIONS FOR FARMERS IN RURAL COMMUNITIES TO ADAPT TO CLIMATE CHANGE IN OGUN STATE NIGERIA

Presented by:

Federal University of Agriculture
Abeokuta, Ogun State Nigeria

Preamble and Aim of the Study

- As technology has improved, digital solutions have been developed to handle a huge range of tasks and to solve many different kinds of problems.

- Digital solution is a computerized method of doing something that otherwise would have to be done in another and often slower and more time consuming.

- To put it another way, its about using technology to help streamline processes or to solve problems.

Overview of the Study

The European Commission supported three (3) Universities;

- University of Agriculture and Environmental Sciences, Umuago;
- Federal University of Agriculture, Abeokuta; and
- Al-Hikmah University, Ilorin

to implement a research project, titled –

"Promoting Digital Solutions For Farmers In Remote Communities To Adapt To Climate Change".

Objectives of the study

The main objective of the study is to promote digital financial solutions for farmers in rural communities to adapt to climate change in Nigeria, while the specific objectives are to;

1. characterise the digital financial solutions (DFS) that are available to the farmers in the country that can make them build resilience against climate change in remote communities

2. examine the farmers in remote communities' knowledge of building resilience against climate change through digital financial solutions ,

3. analyse the capacities of farmers through digital training to apply climate-smart agricultural practices and promote investments in alternative livelihoods to enhance household incomes,

4. examine the capacities of local authorities to facilitate DFS to promote investments in small-scale sustainable agriculture and green projects.,

5. analyse how national regulatory policies and framework, particularly the Universal Access Right, have helped extend DFS to farmers in remote communities and locations, particularly th**e** universal access rights on ICTs , and,

6. stimulate policy actions arising from the study towards IT, innovative agriculture curriculum review and innovative financing model.

Study area and Location selection

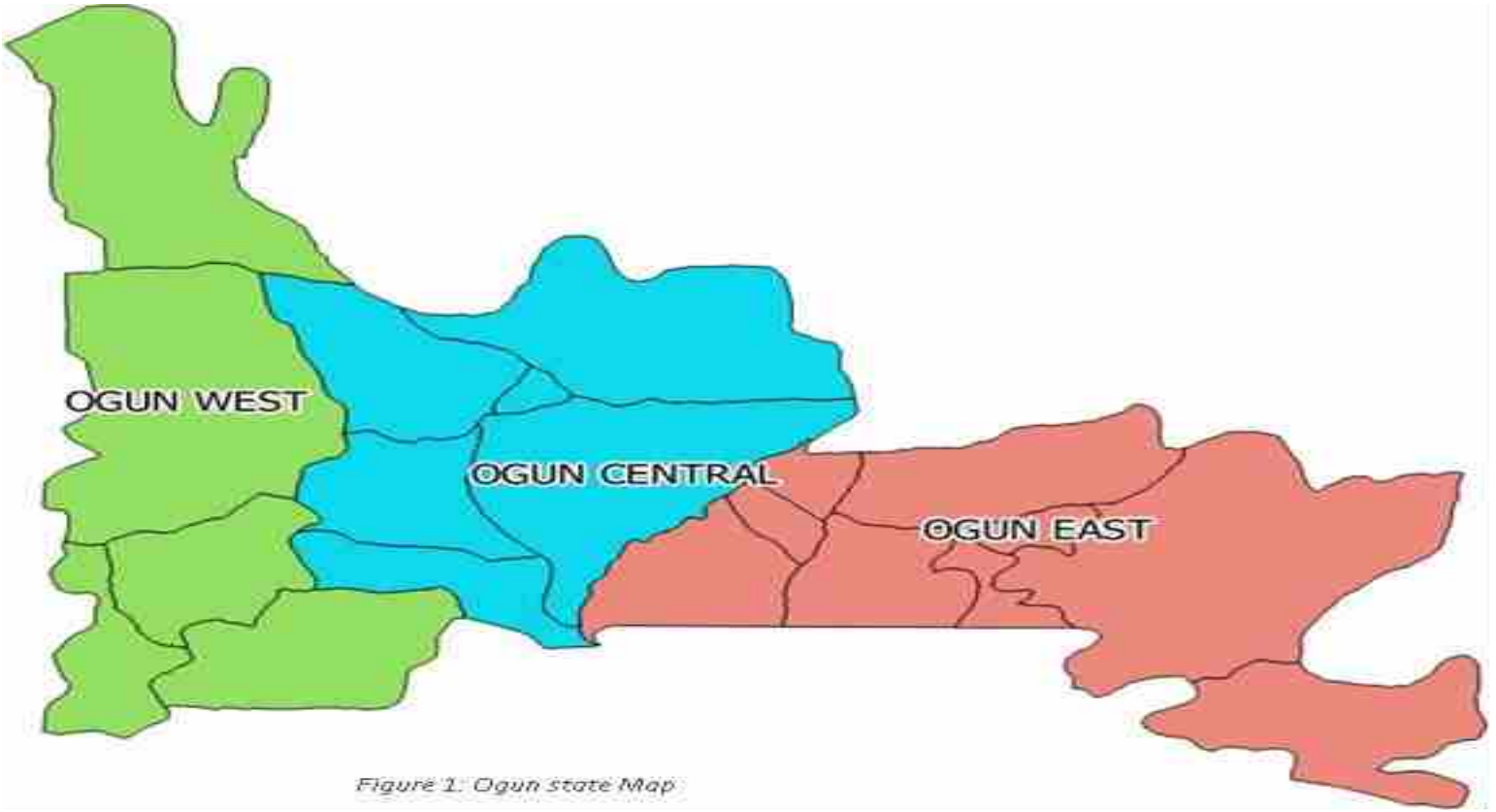


Figure 1: Ogun state Map

OGUN WEST SENATORIAL DISTRICT – Yewa North LGA

OGUN CENTRAL SENATORIAL DISTRICT – Odeda LGA

OGUN EAST SENATORIAL DISTRICT- Odogbolu LGA

Data collection and research instruments

- **Data** were collected strictly from primary sources via the use of the Kobo Collect Tool App.

- **Target respondents:** Rural Cassava Farmers, Small Ruminant Farmers, CBOs, Local Government Authorities, Ministries, Departments and Agencies (MDAs), Local government chairman/counselors, Traditional rulers, Agricultural services department, opinion leaders, Community Development Association executives, religious leaders etc.

- **Data collected were analysed** using descriptive statistics reported as percentages and illustrated as figures for proper data visualization


KEY
FINDINGS
YOUR COMPANY NAME

Table 1: Distribution of sampled LGAs location

LGAs	Percentage
Odeda	34.93
Odogbolu	33.19
Yewa North	31

Table 2: Rural farmers disaggregated by Gender, Age group and Level of Education

Description	Percentage
Gender	
Female	57.21
Male	42.79
Age group (Years)	
18 – 35	17.25
36 – 60	65.28
Above 60	16.59
Level of Education	
None formally	15.94
Primary	34.72
Junior Secondary	2.84
Senor Secondary	29.91
Grade II / Technical	3.06
Diploma/OND	2.84
Higher Diploma/HND	1.97
NCE	0.87
Bachelor Degree	5.68
Masters Degree	1.31

Table 3: Source of Land, Farm Income Sustenance, and Engagement in Other Livelihood Activities

Description	Percentage
Source of land	
Leased	58.3
Personally Inherited	28.82
Community/extended family land	13.76
Purchased	10.92
Annual Sustenance of farm income	
Yes	40.17
No	59.83
Engaged in other livelihood activities	
Yes	59.39
No	39.52
Non-farm Activities	
Trading	35.37
Artisanship	13.97
Paid Job in Govt/Private Sector	5.68
Craftmanship	5.46
Transportation services	4.59
Religious services	4.37
Social services	3.71

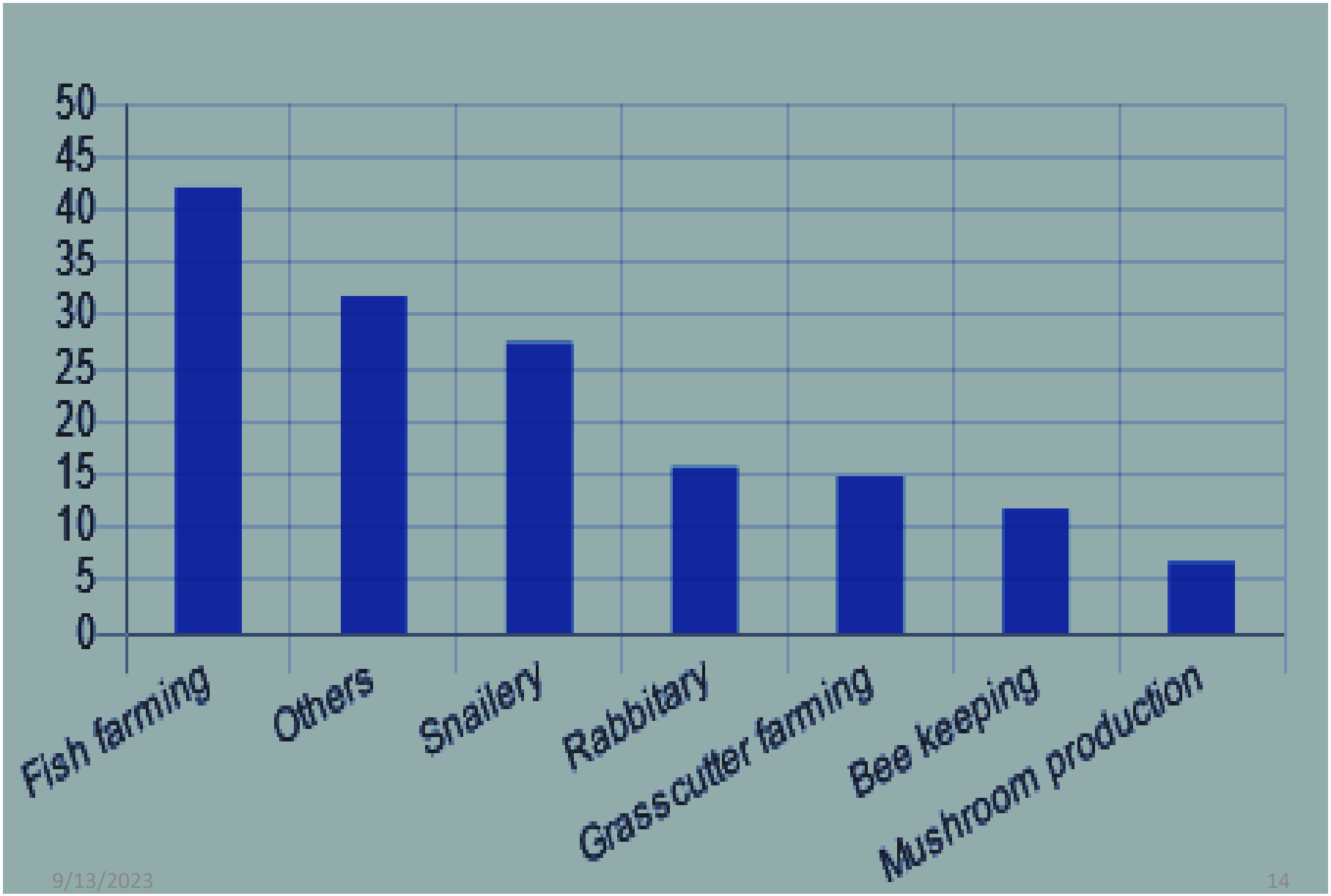
Table 4: Spread of agricultural activities engaged by the farmers

Types of agricultural activities involved in	Percentage
Arable crop production	98.03
Livestock production	20.09
Processing of Agricultural Produce	16.38
Tree crops production	13.76
Marketing of Agricultural Produce	13.76
Fish farming	3.93
Trading in Agricultural inputs	2.18
Provision of Services to Other Farms	1.31
Others	1.31
Labour Supply to Other Farms	1.09
Provision of mechanization services	0.66
Forest Produce Collection & Sale	0.22

Table 5 : Income from different agricultural activities engaged in by farmers

Description of income	Crop production	Livestock Production	Aquaculture & Fishery	Agro-processing Activities	Marketing of Agric. Produce	Providing Agric. services
100,000 - 200,000	16.2	7.5	.9	4.6	5.5	2.40
200,001 - 300,000	13.6	2.9	.7	5.0	3.5	2.00
300,001 - 400,000	5.7	.9	.4	.9	0.90	0.90
400,001 - 500,000	10.7	2.0	.2	3.1	3.7	0.70
500,001 - 600,000	11.0	.7	.2	1.8	3.1	0.00
600,001 - 700,000	8.6	.2	.2	1.5	.2	0.00
700,001 - 800,000	7.5	0.0	.4	1.5	.9	0.00
800,001 - 1million	5.0	.2	.2	.2	.2	0.00
Above 1million	9.9	.7	.7	.7	1.1	0.00
Below 100,000	10.5	11.4	1.3	10.3	9.9	6.60
No income from source	1.3	73.7	94.7	70.4	71.1	87.50

Fig 3: Interested alternative sources of livelihood activities



Objective: Farmers Awareness of Climate Change and Digital Solutions

RESULT FINDINGS

Table 6: Ownership of Digital Devices by the Rural farmers

Owner of Digital Device	Percentage***
Mobile phone	79.04
Radio	61.79
Television	44.1
Smart phone	36.9
Laptop	5.46
Tablet	2.18
Desktop Computer	1.09

Fig. 4: Telecommunication service providers

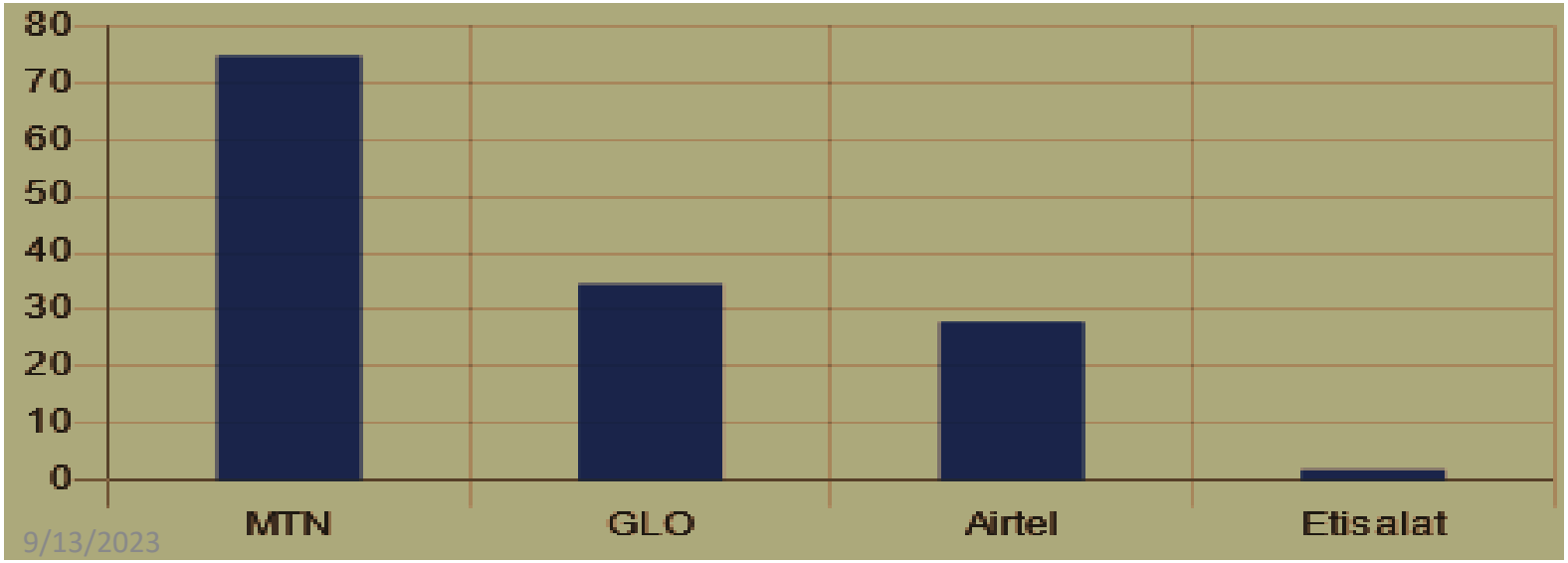


Table 7: Distribution of farmers awareness, perception and losses due to climate change

Description of climate change	Percentage
Awareness of climate change	
Yes	97.6
No	2.40
Perception of climate change* **	
Reduced period of rainfall	75.33
Increased Day-time Temperature	63.1
Drought	53.28
Excessive rainfall	44.1
Higher Incidences of Heat wave	34.28
Increased flooding	26.86
Reduced daylight period	11.79
Incidences of loss due to climate change	
Yes	88.43
No	11.57

Fig 6:Distribution of losses incurred as a result of climate change in the last planting season

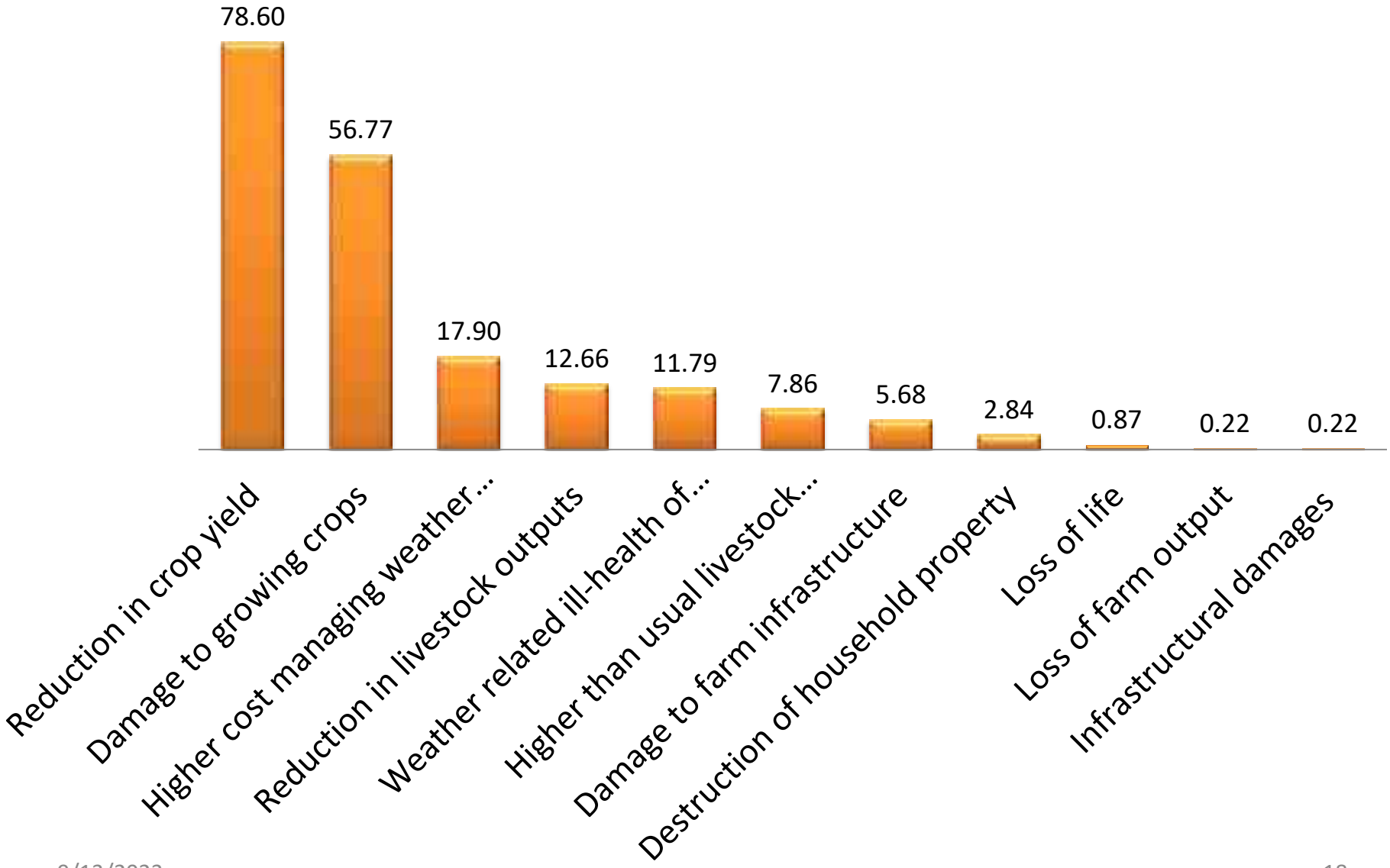


Table 8: Climate Smart Agricultural Practices (CSAPs) Adopted by Rural farmers

Climate Smart Agricultural Practices	Percentage ***
• Planting of early maturing varieties	55.24
• Crop Rotation	52.18
• Early harvest of crops for sale	47.38
• Cultivating of drought tolerant crops	19.43
• Rainwater harvesting to irrigate crop	15.94
• Mulching crops	14.19
• Integrated Crops & Livestock System	11.14
• Fertilizer micro-dosing, use of pellets and dibbing	10.48
• Composting and organic manuring	9.39
• Agroforestry practices	7.86
• Alternate wet and dry rice farm irrigation	4.8
• Seasonal migration	0.22
• Post harvest management techniques	0.22

Table 9: Constraints to CSAPs adoption by farmers

Constraints to CSAPs adoption by farmers	Percentage ***	Rank
• Lack of awareness about CSAPs	65.94	1st
• Low dissemination on information on CSAPs	45.63	2nd
• Inadequate financial resources	44.98	3rd
• Poor literacy level	38.21	4th
• Limited availability of inputs	37.77	5th
• Poor technical know-how	26.2	6th
• Lack of access to agricultural credits	26.2	7th
• High cost of production	24.45	8th
• High cost of inputs	23.8	9th
• High cost of improved crop variety	23.14	10th
• Incidence of pests and diseases	18.34	11th
• Poor extension services	17.47	12th
• Lack of improved storage facilities	11.79	13th
• Non-availability of farm labour	11.14	14th
• Lack of inadequate government policy	6.33	15th

Table 10: Distribution of farmers responses to barriers to usage of Digital solution

Barriers to DS usage	%	Rank
• Lack of digital literacy	72.05	1st
• Lack of digital device	59.83	2nd
• Lack of electricity	42.79	3rd
• High cost of subscription	32.75	4th
• Inadequate assess to agent service providers	26.2	5th
• Lack of internet facility in the community	21.18	6th
• Others (network problems, lack of interest, language issue, etc.)	6.11	7th

Table 11: Digital Financial Services accessible by rural farmers in Ogun state

Description of Digital Financial Services	Percentage***
• Commercial bank	84.28
• Microfinance bank	64.63
• E-Money	56.33
• Agent Banking	49.13
• Mobile Financial services	43.67
• Instant loan	18.78
• International Money transfer	13.54
• Remita	6.77
Previous Training on Digital Financial Services	
No	89.74
Yes	9.39

Table 12: Purposes of using DFS in rural communities

Purposes	**Percentage*** **
Making and receiving payments	65.07
Saving money	61.57
Communication with friends	58.73
Exchange of information	53.71
Access market information	48.69
Learning new farming Skills	44.98
Marketing of farm produce	44.98
Learning alternative skills during off farming period	37.77
Purchasing farm inputs	33.19
For entertainment	29.04
Accessing loans	20.96
Others (Crop health monitoring, and weather forecast, For information on Improved methods)	0.44

Figure 5: DFSs operated by farmers

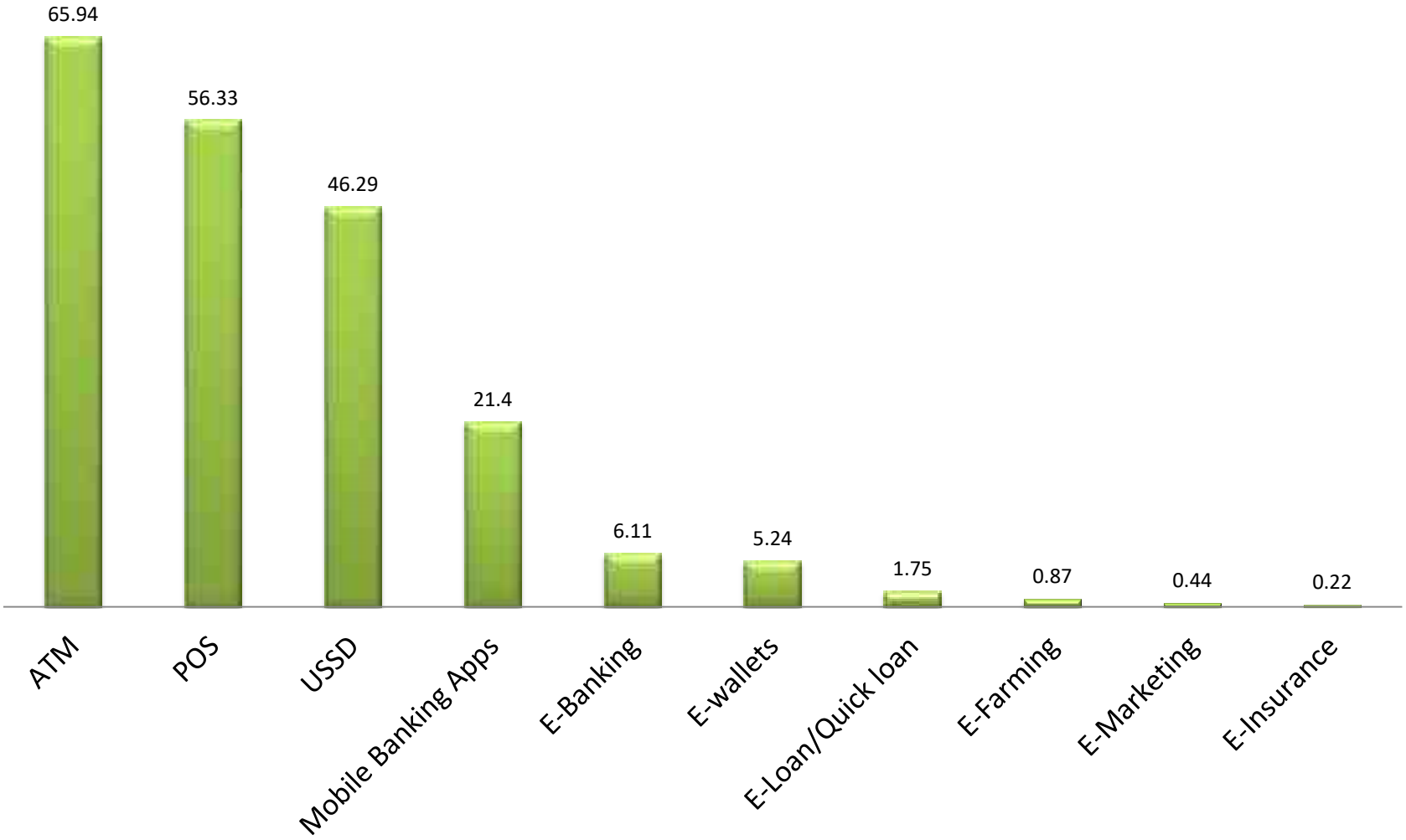


Table 13: Providers of DFSs in Rural communities in Ogun State

Providers of DFSs	Percentage	Rank
• Commercial bank	86.46	1st
• Opay Digital services Limited	21.62	2nd
• Microfinance bank	17.03	3rd
• PalmPay Limited	14.41	4th
• Interswitch	3.49	5th
• Social Media Platforms	2.84	6th
• Remita	2.18	7th
• Kuda	1.75	8th
• Quick Response Code	0.87	10th
• MKudi	0.44	11th
• Pagga	0.44	11th
• Others (Vulte, MoMo agent, Money Master, Flutterwave, Piggyvest)	1.10	9th

Table 14: Channels by which rural farmers assess Mobile Financial Services

Mobile Financial Services	Percentage
Unstructured supplementary Service Data (USSD)	27.29
Point of Sale (PoS)	19.87
Short message Services (SMS)	16.16
Mobile apps	12.66
Agent Location	9.39
Web based service	3.28
Social media platforms	1.75

Table 15: Average Cost of DFSs Transaction made by the Rural Farmers

Range of cost of transaction (₦)	Digital Financial Services							
	E-money	Remita	Mobile Financial services	Agent Bank services	International Money Transfer	Instant loan	Micro-finance Bank	Commercial Bank
No Transaction	39.3%	93.9%	64.9%	58.6%	95.4%	93.9%	78.9%	12.7%
< 1000	47.8%	5.0%	32.5%	33.6%	3.9%	5.9%	19.1%	82.0%
1000 -2000	2.6%	0.4%	0.4%	0.7%	-	-	0.2%	-
2001 - 3000	0.9%	-	0.4%	0.2%	-	-	-	0.2%
3001 - 4000	0.2%	-	-	0.2%	0.2%	-	-	-
4001 - 5000	2.4%	-	0.4%	1.1%	0.2%	-	0.4%	0.2%
5000 & above	6.8%	0.7%	1.3%	5.7%	0.2%	0.2%	1.3%	4.8%
Mean cost	4,161.09	9,853.04	3,676.34	4,244.58	1,861.90	732.14	1,344.01	3,108.56
Median	200.00	0.00	117.50	300.00	0.00	0.00	0.00	28.50

Table 16: Distribution of Digital Literacy Training (DLT) and Digital Literacy Skills (DLS) of Rural Farmers

Are you digitally literate	Percentage
No	60.26
Yes	38.86
Have you had any digital literacy training	
No	94.54
Yes	4.59
Willingness to receive DLS	
Yes	83.84
No	16.16
Quantity of time and resources willing to invest in DLT	
50% time and resources	28.17
10% time and resources	25.98
25% time and resources	25.33
75% time and resources	12.66
100% time and resources	3.06
Willingness to apply for grant for DLT	
Yes	76.64
No	21.4

Table 17: DLTs of Interest to the rural farmers

Interested DLT	Percentage***	Rank
E- Farming/Apps	0.22	
E-Commerce/E-marketing	1.2	
Basic computer skills	2.4	
Accessing climate information using digital device	12.0	
Navigating the internet for information	3.5	
Social Media training	13.6	
Online Financial Management	23.5	4th
Social Media marketing	35.7	3rd
Mobile financial services	40.7	2nd
Web design	0.22	
Internet banking	56.3	1st
Precision agriculture and digital marketing	2.4	

Capacities of local authorities to facilitate DFS to promote investments in small-scale sustainable agriculture and green projects.

RESEARCH FINDINGS

Table 18: Distribution of Sampled Local Authorities in Ogun state

Local Authorities	Percentage
Local government officers	13.5
Agricultural services department	19.9
Cooperatives/Farmers group	33.3
Traditional leaders	7.4
Civil society	22.2
Financial institution	3.7

Fig 6: Distribution of local authorities on climate change training

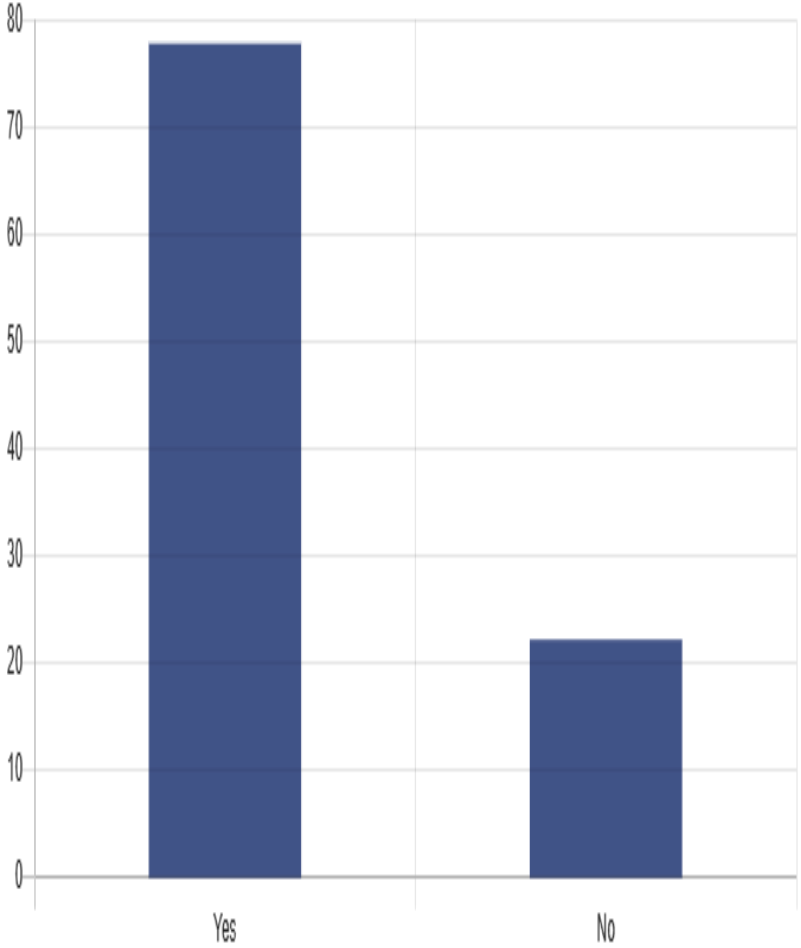


Fig 7: Types of climate change training received by Local authorities

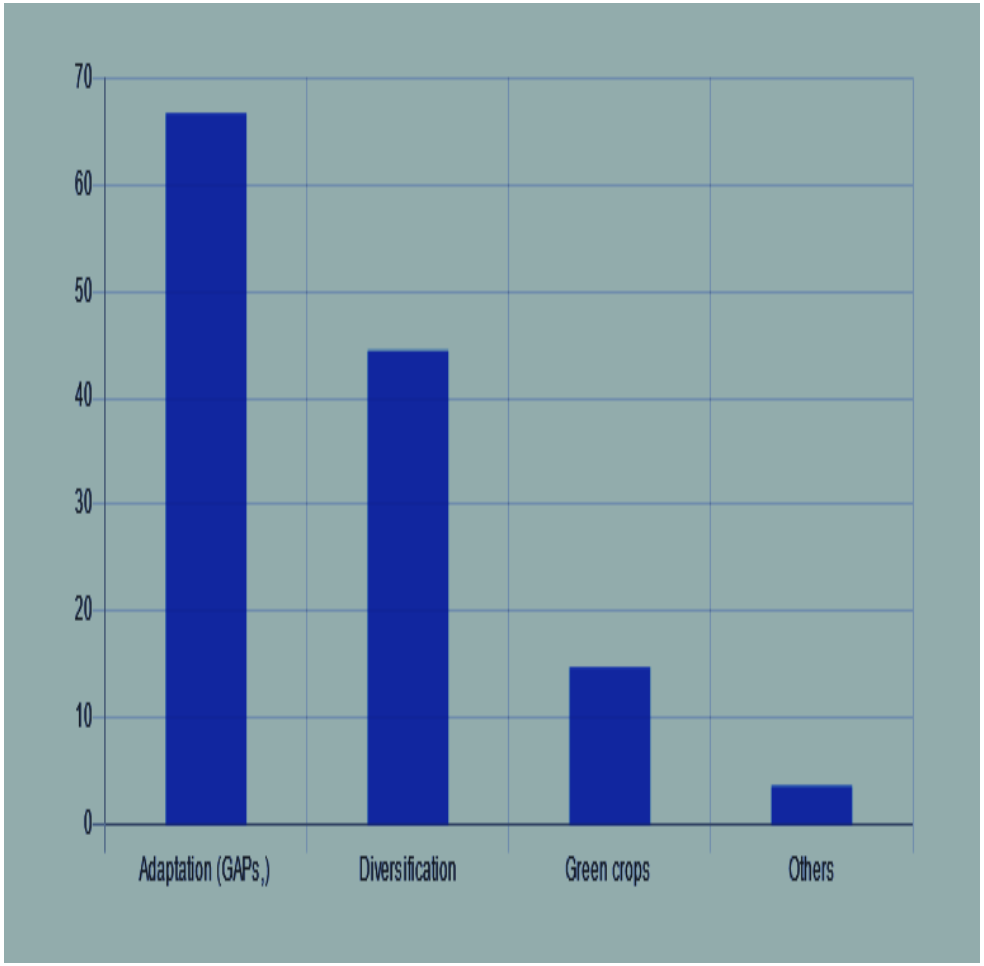


Table 19: Local Authorities and Trainings on Digital Solutions

Received Digital Solution Training	%
No	59.26
Yes	40.74
Willingness to receive digital solution training	100.00

Trainings Needed	%
Digital Financial Solution	25.9
Digital marketing and Agro based information to enhance production	29.6
Digital Advisory Solution	14.8
Training on use of digital device as alternative means of livelihood	3.7
E-Farming and Weather forecast	11.1

Table : Providers of the Digital Solution Trainings Received

Training Providers
Federal Ministry of Agriculture
GIZ, OCP, IITA
Federal Government of Nigeria
West Africa Virus Epidemiology (WAVE)
IFAD, VCDP
IITA, GIZ, OCP, FUNAAB
VCDP (OGADEP, FUNAAB) IITA

Table 20: Digital solutions available to the local authorities

Available digital solutions	Percentage***
Mobile Banking Apps	62.96
PoS	51.85
USSD	37.04
ATM	29.63
E-banking	18.52
Farm Mgt Software	11.11
E-Loan	11.11
Precision Agric Tech	7.41
Digital Market Places	7.41
E-wallets	7.41
E-Farming	7.41
E-Insurance	3.7

Table 21: Distribution of existing digital infrastructures available for use by the local authorities

Existing Digital Infrastructure	Percentage
Mobile telecom	55.56
Internet backbone	18.52
Data centers and networks	14.81
Digital communication suites including apps	11.11
Operational security, user identity and data encryption	7.41
Application Programming Interphase (APIs) and Integrations	7.41
Enterprise portals, platforms, systems and software	3.7
Cloud services and software	3.7

Table 22: Local Authorities' Responses on Farmers' Adoption and Use of Digital Solutions in Rural Communities

Description	Percentage***
Improved farming tips	70.37
Access and use of financial services	51.85
Better access to value chains	51.85
Provides potential buyers information	48.15
Market prices information	48.15
Advance farm planning	33.33
Improved Rural outreach	29.63
Offering timely information on weather conditions	29.63

Table 23: Distribution of barriers to adoption of digital solutions by local authorities

Barriers	Percentage***
Inadequate infrastructure	77.78
Lack of financial literacy	66.67
Lack of digital literacy	51.85
Inability to transact due to network/service downtime	51.85
Limited financial product choices for smallholder farmers	29.63
Lack of reading literacy	29.63
Insufficient consumer protection measures	25.93
Low quantity and quality of agent networks	25.93
User interfaces that many find complex and confusing	22.22
Inadequate data privacy and protection	11.11
Non-transparent fees and other terms	7.41

Fig 8: DSs used during the off-farm season

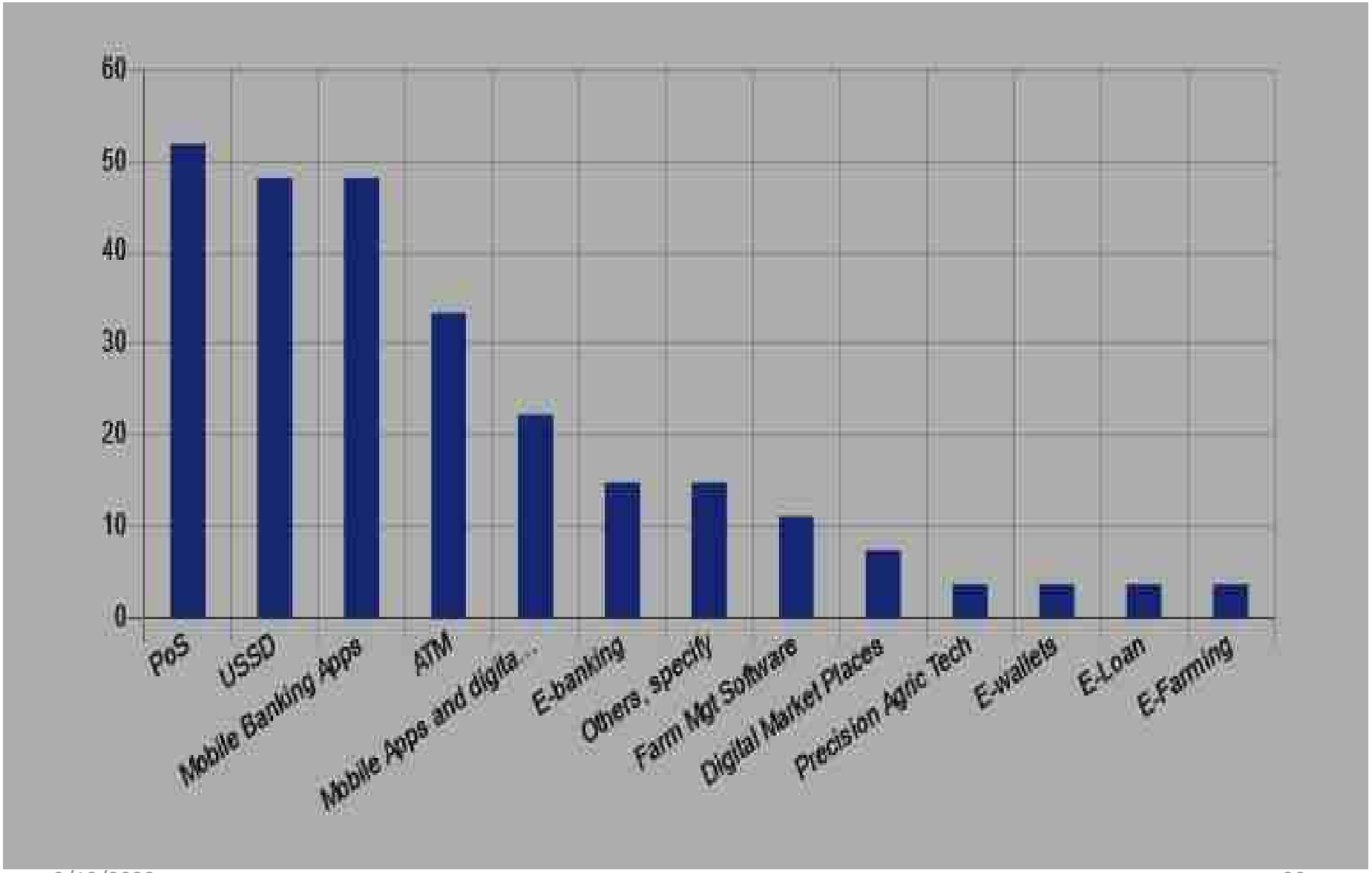


Table 24: Local Authorities' Responses on how digital infrastructure can mitigate climate change

Platform for farmers to share knowledge, business ideas, questions and suggestions on access to quality products	**88.89**
Providing Digital advisory services	85.19
Accurate weather and climate forecasts combined with agronomic advisories can increase the ability of farmers to respond to high impact events and weather conditions	81.48
Digital agriculture can increase connectivity between farmers	74.07
Better access to high-quality, real-time data which can be utilized to adapt to climate impacts	62.96
Data from digital solutions can be used to respond to extreme climate events	62.96
Remote-sensing data can be used to inform national-level adaptation plans	59.26
Spatial information can provide a powerful data set to inform future government priorities and decisions	44.44

Table 24: aware of any government policy targeted at enhancing the use of DSs by farmers to build resilience against climate change

Awareness of policies	Percentage
No	70.37
Yes	25.93
Existing known Policies	
Drought and desertification policy	18.52
National Forest Policy	18.52
National Biodiversity Strategy and Action Plan	14.81
National sanitation policy	14.81
Erosion, flood control and coastal zone management policy	11.11

Table 25: **Have farmers been supported in rural communities in receiving DSs from either the government, NGOs or other sources to enable the use of DSs to build resilience against climate change**

Received Training support	Percentage
No	62.96
Yes	33.33
Trainings received	
Training on good agricultural practices	3.7
Training on climate change Field day	3.7
Weather reading equipment training	3.7
Agricultural management information systems (AMIS)	3.7
Digital solution	3.7
Weather situation monitoring training on Wind vane, Anemometer, Rain guage, etc.	3.0

Table 26: Presence of Digital Innovation Hubs or Digital centre(s) that provide training in digital literacy

Presence of Digital Hub in the community	Percentage
No	77.78
Yes	14.81

Table 27: Competences of Digital Hubs in the Communities in Ogun State

Technical skills in the field of digital solutions and ICT infrastructure	Percentage
Somewhat competent	51.85
Very competent	25.93
Not competent	18.52
Ability to collaborate with other partners and stakeholders	
Very competent	51.85
Somewhat competent	40.74
Not competent	3.7
Access to necessary equipment and software	
Somewhat competent	59.26
Very competent	29.63
Not competent	7.41
Knowledge of the local context and needs of the beneficiaries	
Very competent	48.15
Somewhat competent	40.74
Not competent	7.41
The ability to provide training and support to farmers and other beneficiaries	
Very competent	51.85
Somewhat competent	44.44

Conclusion

It can therefore be concluded that:

- Rural farmers are involved in other livelihood activities, as it was evident that the income from farming activities alone could not sustain them throughout the year hence the reason for additional sources of income.

- Rural farmers are aware of the incidence of climate change and had different perceptions to defining climate change.

- Rural farmers are of the opinion that digital solutions (DSs) can provide appropriate information on resilience to climate change.

- The digital financial services mostly performed by the rural farmers include; cash withdrawals , savings, cash deposits , and cash transfers .

- It is evident that the rural farming were not digitally literate, and about 94.54% of the farmers had not participated in any digital literacy training in the state, and as such are willing to be trained.

Recommendations

It is therefore recommended that ;

- Ogun state needs to intensify support for rural farmers to be trained in alternative sources of income activities, digital literacy, and CSAPs adoption to improve the livelihood status of the rural farmers in the state.

- Awareness, dissemination and adoption of digital solutions in adapting to climate change are yet to reach the rural communities, therefore there is need to strengthen the stakeholders to deliver this new technologies to the rural farmers to facilitate sustainable and improved livelihood as well as food and nutrition security of the rural households in the remote communities.

- Furthermore more efficient internet enabled infrastructure and facilities should be put in place in the rural communities.


Thank You

PHOTO GALLERY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