USING FARMERS' SURVEYS TO INFORM A MULTISOURCE DROUGHT MONITORING SYSTEM FOR RAINFED RICE PRODUCTION IN NIGERIA.

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GOAL AND POTENTIALS

- **GOALS**

i. The primary goal of the project is to expand the existing meteorology-based national drought early warning system by incorporating indicators relevant to monitoring agricultural droughts, such as soil moisture and vegetation health/stress.

ii. To enhance the resilience of rainfed rice production systems to droughts by providing accurate and timely information.

iii. Validate the EO based methodology utilizing on-site data including farm surveys.

- **POTENTIALS**

i. Improved agricultural drought early warning systems.

ii. Increased rice yields and food security.

iii. Leveraging on the current project by future research into critical topics that affect food security.

OUR STRATEGY

- **SAMPLING & FIELD DATA COLLECTION**

i. Multi-Stage Sampling Technique (Selection Criteria)

- First Stage: 5 States and have visited 4 (Ebonyi, Nasarawa, Nigeria and Ogun states).
- Second Stage: 10 Local Government Areas and 39 rice-producing communities.
- Third Stage: 226 rainfed rice Farmers (IFAD-VCDP).
- Sampling unit: Single rice plots.

ii. The design of the farm survey was based on the four Pillars of Drought Management.

iii. Administration of the survey and collection of historical yield data.

iv. GPS field-observed coordinates of the boundaries of the sample rice plots.

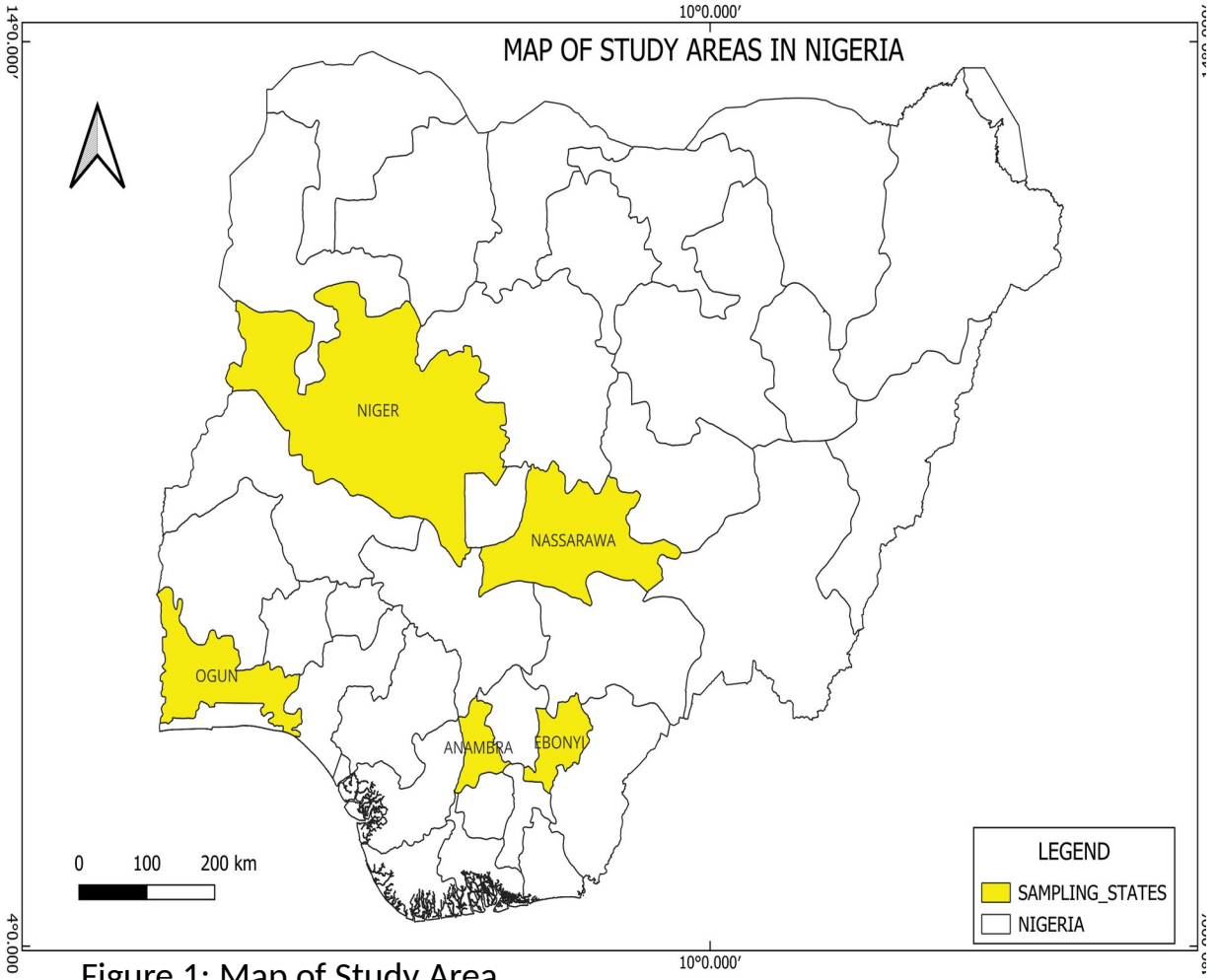

Figure 1: Map of Study Area.

PROJECT MILESTONES

Figures 2 and 3: Administration of Questionnaires at Katcha and Ivo LGAs of Niger and Ebonyi states.

Figure 4: Rice Field observation of GPS Coordinates

SURVEY ANALYSIS & DISCUSSION

DEMOGRAPHY	• Total Rice Farmers Surveyed:226 • Male: 199 (88.1%) • Female: 27 (11.9%)	• Significant gender disparity. • Socio-economic and Cultural factors that limit women's access to land and support programs.
FARMING PRACTICES	• Avg. Plot Sizes: 0.25-5 Hectares • Rice Variety: FARO 44 (57.1%), OFADA (23.9%), Others(15.6%) • Ecology: Rainfed lowland & Upland • Planting & Harvest months (June:46.5% - October: 30.1%)	• Smallholder Rice farmers. • Prevalence of high yield – drought-resistant variety • Dominance of rainfed lowland/shallow swamps. • Staggering in establishment months denotes heavy dependence on seasonal rains and adjustments to changing rainfall patterns.
RICE FARMERS DROUGHT PERCEPTION	• 2019 (4.5% of farmers reported moisture shortages) • 2020 (14%), 2021 (9.25%), 2022 (18%), 2023 (20.75%) & 2024 (34%) • Peak Months of stress: July (29.2%), August (29%) & June (15.3%)	• Steady increase across the years in reports of drought-like phenomena by Rice farmers. • Changes in Climatic Conditions (hotter temperatures, shifting precipitation patterns, and longer dry spells). • Crucial window for targeted drought mitigation efforts.

SURVEY ANALYSIS & DISCUSSION

DROUGHT IMPACT	• Crop Calendar: 44.2% reported changes, while 55.8% did not change. • Reported crop losses (Panicle Initiation: 58%, Tillering: 23.7%, Milk-Dough: 14.1% & Full maturity 4.2%). • Yield losses: Avg. 2020-2023 (34.3%), 2024 (55%).	• Growing awareness of climate variability. • Higher Crop losses due to moisture shortage at the critical stage of crop growth. • Substantial loss in 2024, marking a 60.17% increase.
EARLY WARNING & INFORMATION SOURCES	• 51.8% received alerts on climatic changes (flooding, precipitation patterns). • 48.2% had never received any alerts.	• Radio (44.6%). • Extension Officers (26.7%). • WhatsApp & Social Media: (6.86%). • Other Sources (20.84%).

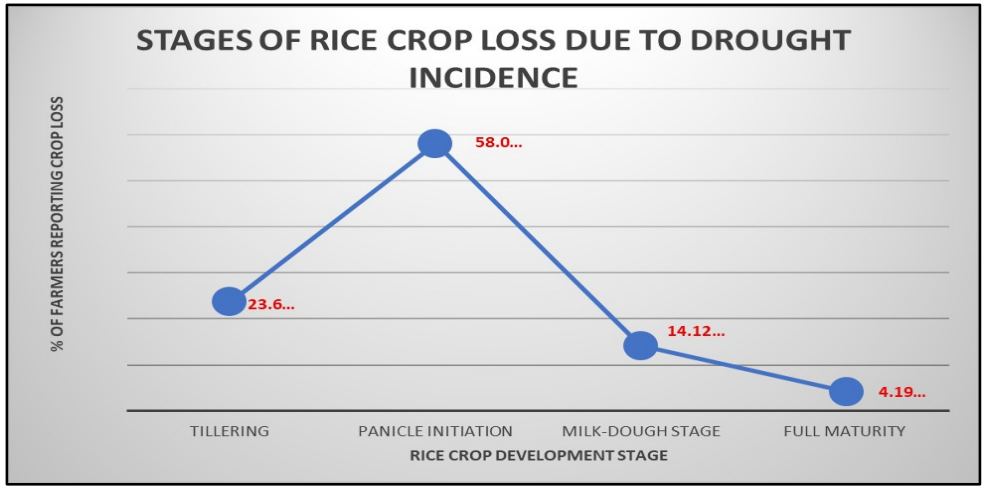

Figure 4: Stages of crop loss

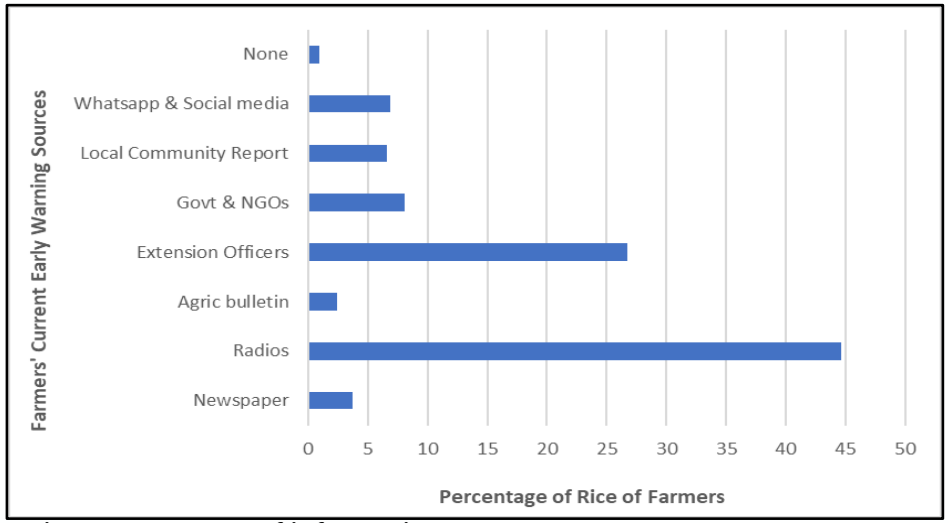

Figure 5: Sources of information

COLLABORATION VISIT TO UNN

NEXT STEPS...

MOFODRONI

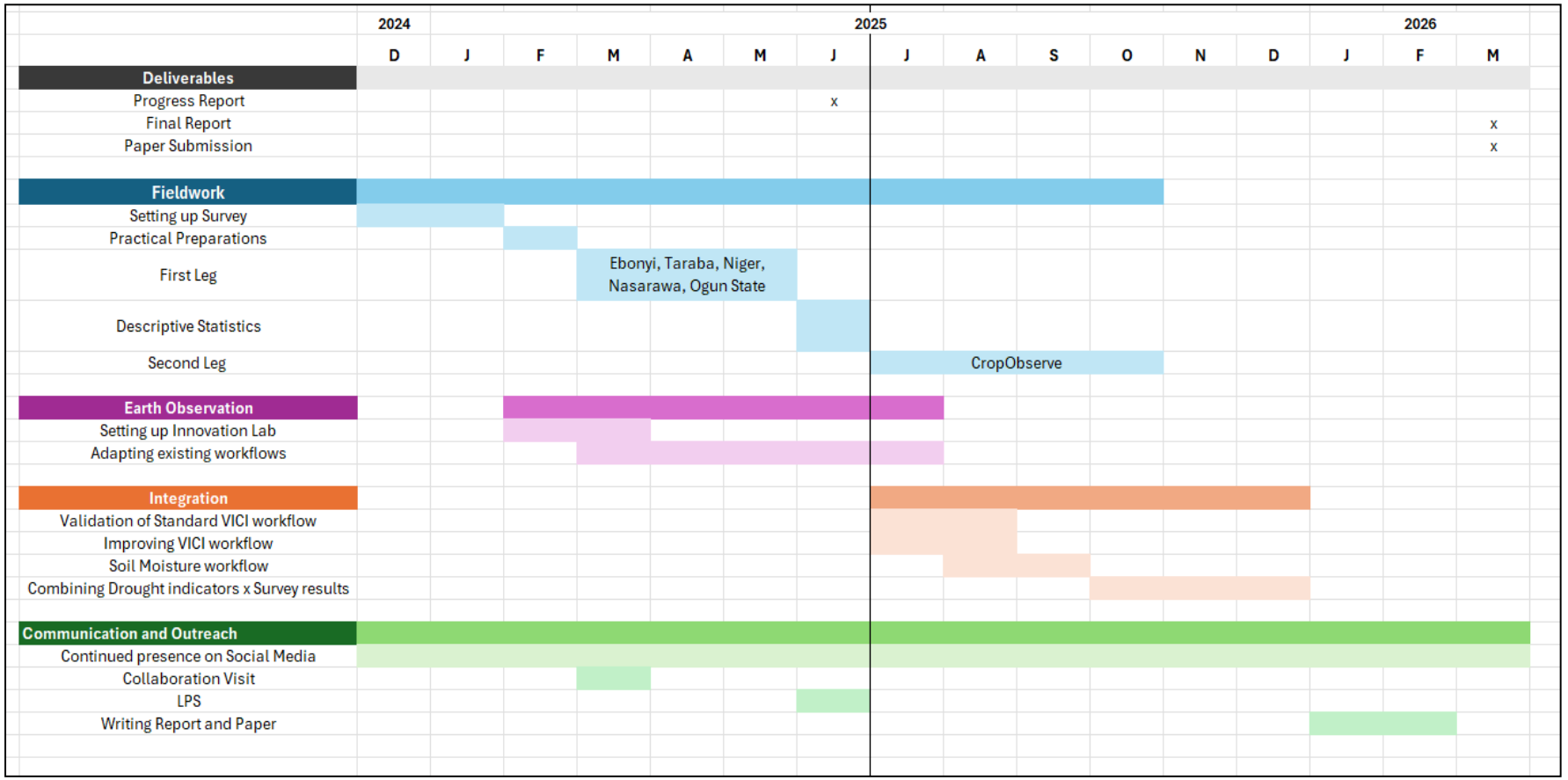

Figure 7: Project workflow

→ Deep-dive into current workflows:

= How well do they describe the situation on the field?

- Vegetation (NDVI/VICI)
- Soil Moisture (SWI)

→ Integrate survey results into EO workflow

= How can we use the survey results to improve the existing workflows?
(redefine zoning, combination of indicators, validation...)

THANK YOU.