INDONESIA'S PILOT PROJECT ON INTEGRATED STRAW MANAGEMENT

INCEPTION WORKSHOP FOR THE PILOT PROJECT ON
AGRICULTURAL MECHANIZATION FOR SUSTAINABLE REDUCTION OF RICE STRAW AND SUGARCANE TRASH BURNING IN THAILAND

IMPACT ARENA | MUANG THONG THANI BANGKOK | 24 – 25 JULY 2025

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UGM–CSAM COLLABORATIVE PROJECT TEAM MEMBERS – YEAR 2025

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PRESENTATION MATERIALS

THE GOVERNMENT POLICY ON AGRICULTURAL WASTE ISSUES AND SUSTAINABLE ENVIRONMENT

PILOT PROJECT STATUS: OBJECTVES, PILOT SITES, KEY ACHIEVMENTS & OUTCOMES

CONCLUSIONS: RECOMMENDATIONS & LESSON LEARNT

THE **GOVERNMENT POLICIES** ON AGRICULTURAL WASTE & ENVIRONMENT

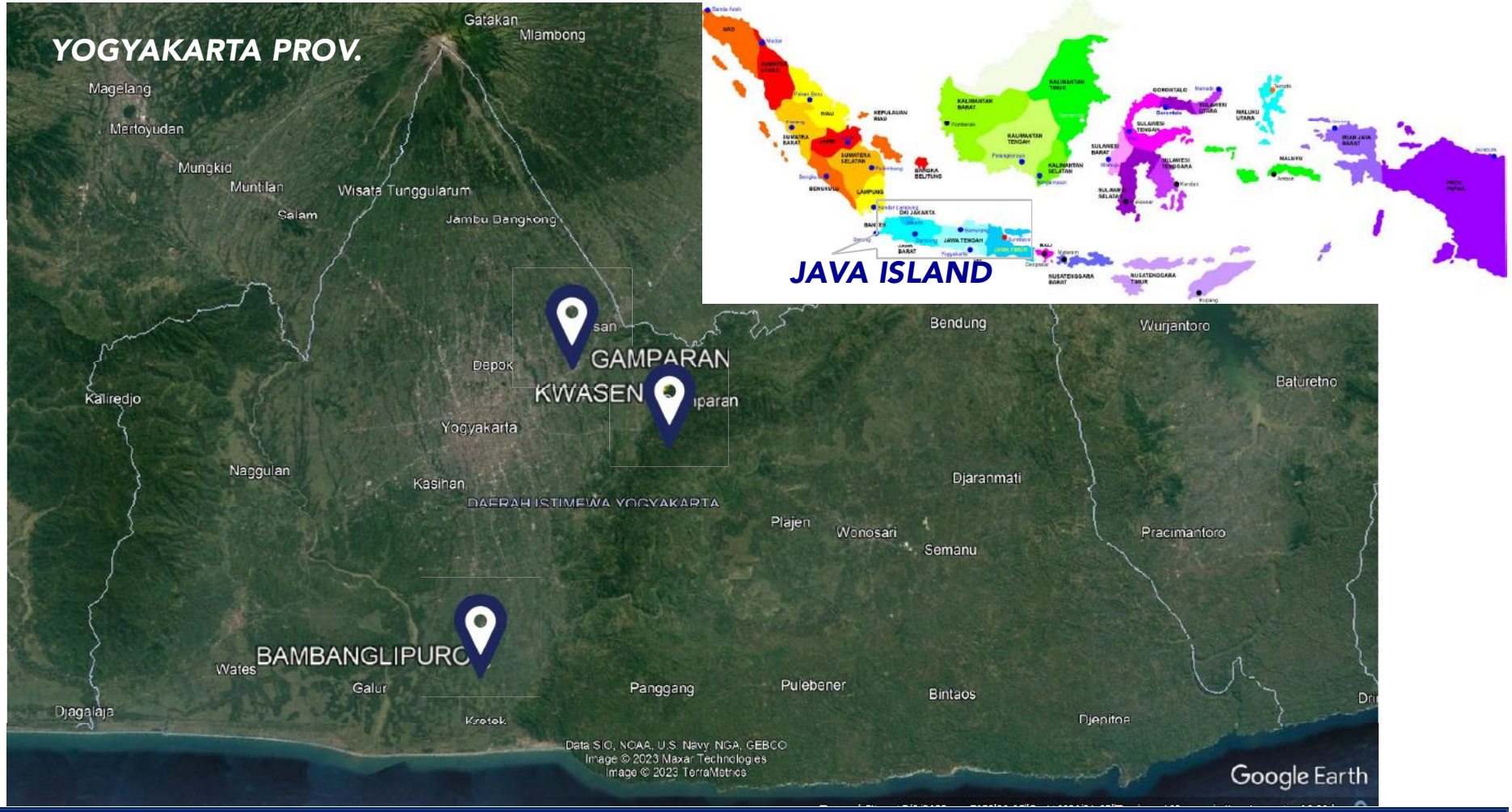
- LAW NO. 32 OF 2009 ON ENVIRONMENTAL PROTECTION AND MANAGEMENT
- GOVERNMENT REGULATION NO. 22 OF 2021 ON IMPLEMENTATION OF ENVIRONMENTAL PROTECTION AND MANAGEMENT
- MINISTER OF ENVIRONMENT AND FORESTRY REGULATION NO. 15 OF 2019 ON THE QUALITY STANDARDS FOR AGRICULTURAL WASTE INCINERATION EMISSIONS
- MINISTER OF AGRICULTURE REGULATION NO. 70 OF 2011 ON MANAGEMENT OF AGRICULTURAL WASTE

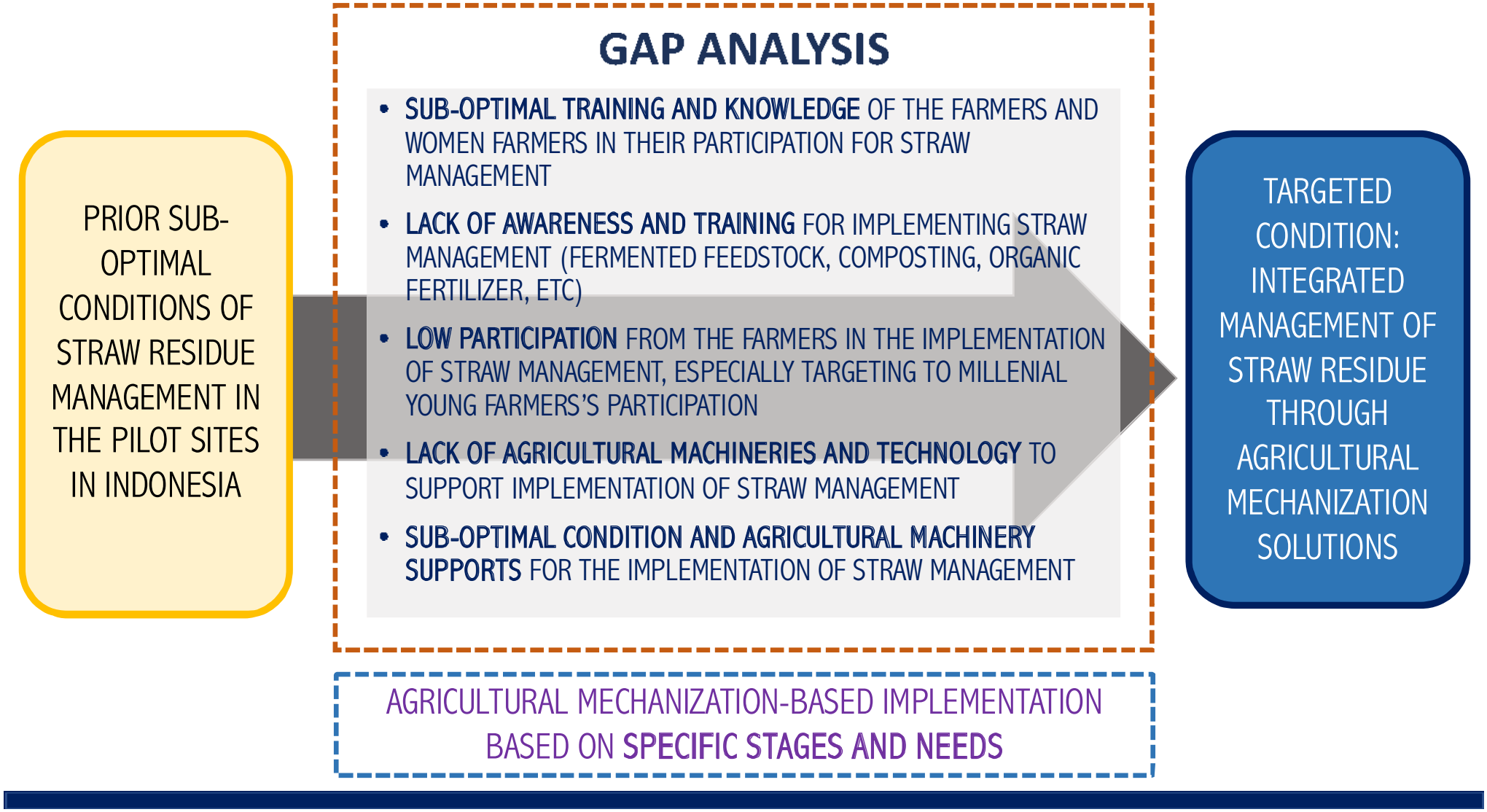
1. TO PREVENT AND CONTROL RISKS TO WATER, SOIL AND AIR QUALITY;
2. TO PROMOTE ENVIRONMENTALLY FRIENDLY AGRICULTURAL PRACTICES (ORGANIC, INTEGRATED FARMING);
3. TO ENSURE ECOSYSTEM SUSTAINABILITY, BIODIVERSITY PROTECTION, AND PUBLIC HEALTH.

PILOT PROJECT ON **INTEGRATED STRAW MANAGEMENT** | MAIN **OBJECTIVES**

- TO ESTABLISH PILOT SITES FOR **INTEGRATED MANAGEMENT** OF STRAW RESIDUE
- TO IMPROVE **TECHNOLOGIES AND PRACTICES** FOR INTEGRATED MANAGEMENT OF STRAW RESIDUE
- TO ENHANCE **CAPACITIES OF FARMING COMMUNITY** AND CHANGE AGENTS FOR ADOPTING IMPROVED TECHNOLOGIES AND PRACTICES FOR INTEGRATED MANAGEMENT OF STRAW RESIDUE

PILOT PROJECT ON **INTEGRATED STRAW MANAGEMENT** | **PILOT SITES**




PRIOR SUB-OPTIMAL CONDITIONS OF STRAW RESIDUE MANAGEMENT IN THE PILOT SITES IN INDONESIA
GAP ANALYSIS
• SUB-OPTIMAL TRAINING AND KNOWLEDGE OF THE FARMERS AND WOMEN FARMERS IN THEIR PARTICIPATION FOR STRAW MANAGEMENT
• LACK OF AWARENESS AND TRAINING FOR IMPLEMENTING STRAW MANAGEMENT (FERMENTED FEEDSTOCK, COMPOSTING, ORGANIC FERTILIZER, ETC)
• LOW PARTICIPATION FROM THE FARMERS IN THE IMPLEMENTATION OF STRAW MANAGEMENT, ESPECIALLY TARGETING TO MILLENIAL YOUNG FARMERS'S PARTICIPATION
• LACK OF AGRICULTURAL MACHINERIES AND TECHNOLOGY TO SUPPORT IMPLEMENTATION OF STRAW MANAGEMENT
• SUB-OPTIMAL CONDITION AND AGRICULTURAL MACHINERY SUPPORTS FOR THE IMPLEMENTATION OF STRAW MANAGEMENT
TARGETED CONDITION: INTEGRATED MANAGEMENT OF STRAW RESIDUE THROUGH AGRICULTURAL MECHANIZATION SOLUTIONS
AGRICULTURAL MECHANIZATION-BASED IMPLEMENTATION BASED ON SPECIFIC STAGES AND NEEDS

PILOT PROJECT ON **INTEGRATED STRAW MANAGEMENT** | **PRIOR CONDITION**

MECHANIZATION-BASED INTERVENTIONS IMPLEMENTED AT THE PILOT SITES

STRAW MANAGEMENT IMPLEMENTATION

ON FARM → **HARVEST** → **POST HARVEST** → **STORAGE/ UTILIZATION**

- COMPOSTING
- FERMENTED FEED MAKING
- PRESSED STRAW STORAGE

IMPLEMENTED AGRICULTURE MACHINERIES BASED ON SPECIFIC PER STAGE AND NEEDS:

ON FARM	HARVEST	POST HARVEST	STORAGE/ UTILIZATION
• HANDY STRAW CUTTER • HAND TRACTOR OF STRAW CUTTER – MOWER • TRAILER / STRAW TRANSPORTATION	• MOBILE RICE POWER TRESHER • MOBILE CORN POWER TRESHER • TRAILER / STRAW TRANSPORTATION	• CHOPPER • GRINDER • CUSTOMIZED STRAW PRESSING MACHINE • TRAILER / STRAW TRANSPORTATION	• CHOPPER • GRINDER • SPRAYER • ROTATING COMPOST SIEVE • TRAILER/STRAW TRANSPORTATION

MECHANIZATION-BASED INTERVENTIONS IMPLEMENTED AT THE PILOT SITES

ON FARM





HARVEST




MECHANIZATION-BASED INTERVENTIONS IMPLEMENTED AT THE PILOT SITES

POST HARVEST

STORAGE/ UTILIZATION

- COMPOSTING
- FERMENTED FEED MAKING
- PRESSED STRAW STORAGE

FIELD TRIALS & TRAINING OF STRAW RESIDUE MANAGEMENT










FIELD TRIALS & TRAINING OF STRAW RESIDUE MANAGEMENT





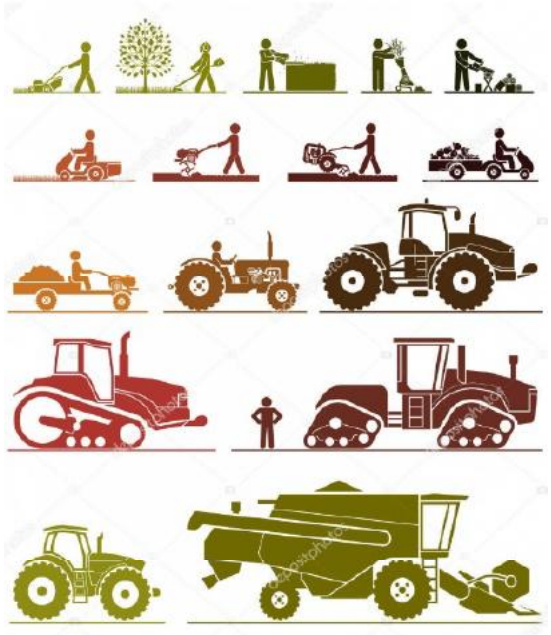

TRAININGS OF STRAW MANAGEMENT PRACTICES WITH THE EXPERT PRACTICIONERS REGARDING TO:

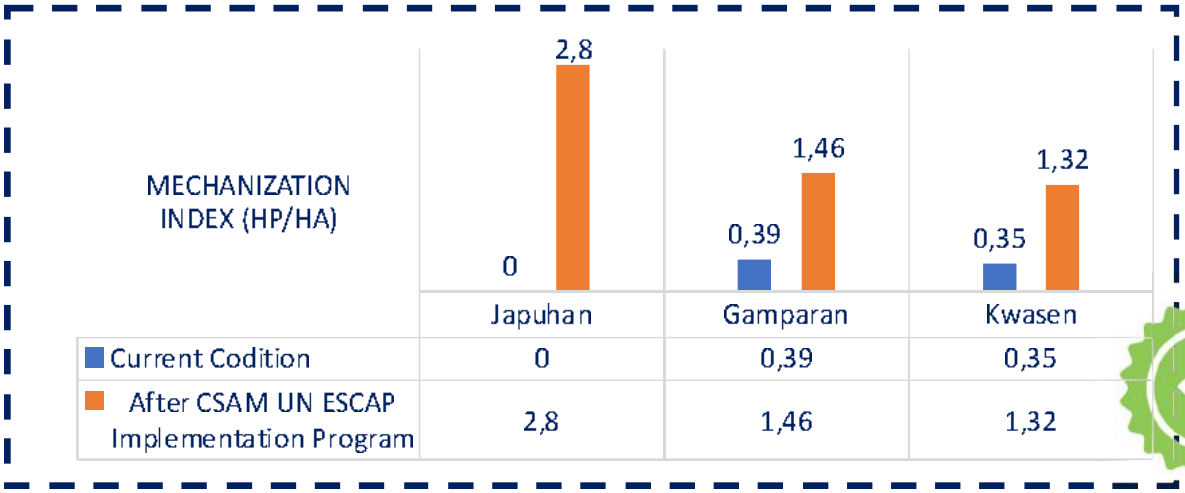
- COMPOSTING
- FERMENTED FEED MAKING

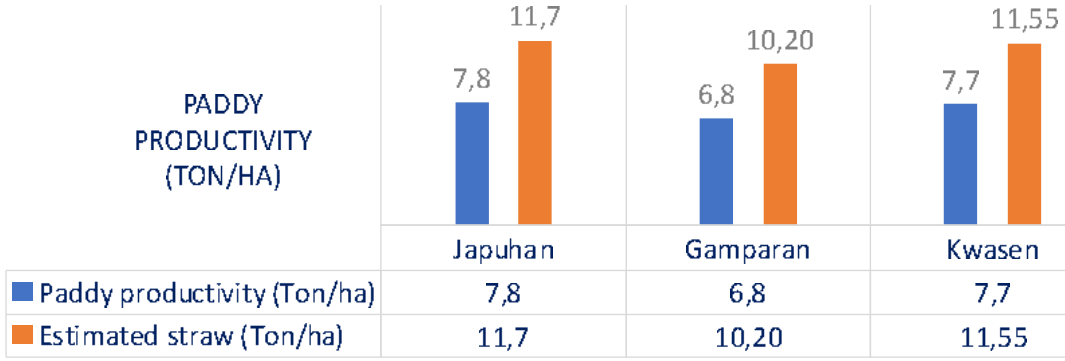
EQUIPPING AGRICULTURAL MACHINERY, FIELD TRIALS & TRAINING, AND MACHINERY MODIFICATION

AWARENESS AND DEMONSTRATION SESSIONS, OFFICIAL MACHINERY HANDOVER, EVALUATION, AND TRANSFER KNOWLEDGE

KEY ACHIEVEMENT #1. INCREASING MECHANIZATION INDEX







KEY ACHIEVEMENT #2. IMPROVED CONDITIONS OF STRAW RESIDUE MANAGEMENT

PILOT SITE	RICE PRODUCTIVITY (TON)		ESTIMATION AMOUNT OF STRAW GENERATED (TON)	
	PS 2	**PS 3**	**PS 2**	**PS 3**
JAPUHAN	7.8	8.6	11.7	13
GAMPARAN	6.8	7.3	10.2	11
KWASEN	7.7	7.2	11.6	10.8

PS 1 (PRIOR CONDITIONS): MOST OF THE STRAW GENERATED WAS LESS UTILIZED DUE TO LOW QUALITY AND RAINY SEASON. ABOUT **20 – 30%** OF THE STRAW RESIDUE WAS **LEFT ON THE FIELD** WITHOUT ANY TREATMENT, ABOUT **70 – 80%** WERE MINIMALLY TREATED BY MANUAL SUN DRYING FOR **DIRECT FEEDSTOCK**

PS-2: **ABOUT 90%** OF THE STRAW RESIDUE WAS UTILIZED FOR DIRECT **FEEDSTOCK AND STORAGE.**

ACHIEVEMENTS TO PROGRAM OUTCOME AND OUTPUT INDICATORS

NO	TARGETS	REALIZATION
1.	IMPROVED CROP RESIDUE MANAGEMENT AND AIR POLLUTION MONITORING FOR SUSTAINABLE AND CLIMATE - SMART AGRICULTURE [CSA]	STRAW RESIDUE MANAGEMENT IN THE STAGE OF ON FARM AND POST HARVEST HAVE BEEN IMPROVED (25 – 35% COMPARED TO PRIOR CONDITIONS)
2.	FARMING COMMUNITY AND CHANGE AGENTS IMPLEMENT IMPROVED TECHNOLOGIES AND PRACTICES AND EVIDENCE-BASED DECISION-MAKING SUPPORTED BY INNOVATIVE AIR POLLUTION MONITORING APPROACHES, FOR INTEGRATED MANAGEMENT OF STRAW RESIDUE	THE TRAINED FARMERS AND WOMEN FARMERS GROUP HAVE IMPLEMENTED MOST OF THE IMPROVED TECHNOLOGIES AND STRAW RESIDUE MANAGEMENT PRACTICES IN THE PROGRAM
3.	BY END OF THE PROJECT, AT LEAST 50% INCREASE IN AMOUNT OF STRAW SUSTAINABLY UTILIZED THROUGH IMPROVED TECHNOLOGIES AND PRACTICES AND EVIDENCE-BASED DECISION-MAKING SUPPORTED BY INNOVATIVE AIR POLLUTION AIR POLLUTION MONITORING APPROACHES AT THE PILOT SITES	THE AMOUNT OF STRAW SUSTAINABLY UTILIZED WAS STILL 25 – 35%. THE PILOT SITES HAVE JUST FULLY EQUIPPED IN JANUARY 2023 AND THE MONITORING RANGE OF THE PROGRAM HAS ONLY BEEN DONE FOR LESS THAN A YEAR (6 MONTHS MONITORED SINCE FIRST PROCUREMENT IN OCTOBER 2022

CONCLUSIONS: SPECIALTIES OF IMPLEMENTATION PROGRAM IN INDONESIA

1. **SMALL SCALE OF AGRICULTURAL LAND**. IT COULD AFFECT TO CHOOSE CERTAIN MACHINERY TO BE UTILIZED AND CONSIDER FURTHER SOIL DAMAGE
2. **APPROPRIATE MECHANIZATION MACHINERY**: SMALLER MACHINERIES ARE MORE CONSIDERED TO BE IMPLEMENTED DUE TO THE SMALL SCALE OF LAND
3. MANAGEMENT OF AGRICULTURAL MECHANIZATION IS **BASED ON COMMUNITY INTERACTION**, WHICH AFFECT **TO STRENGTHEN HUMAN AND SOCIAL CAPITAL**, AND STILL NOT DIRECTED TO ECONOMIC ORIENTATION
4. **AGRICULTURAL MECHANIZATION TAKES IMPORTANT ROLE** AS MEDIATOR FOR ACCELERATING INTEGRATED FARMING SYSTEM IN THE PILOT SITES; THUS, SOME EQUIPPED MACHINERIES WERE CHOSEN FOR SUPPORTING THE INTEGRATED FARMING SYSTEM
5. THE IMPLEMENTATION PROGRAM IS SUPPORTED BY **ACTIVE COMMUNITY INVOLVEMENT** AND COORDINATION WITH **LOCAL GOVERNMENT** (INCLUDING AGRICULTURAL EXTENSION WORKERS).

LESSON LEARNT & RECOMMENDATIONS:

CONTINUOUS PROCESS AND FOLLOW-UP ACTIVITIES ON PROGRAM SUSTAINABILITY

- **QUALITATIVE APPROACHMENT** (LABORATORY TEST, CONTINUED ASISSTING AS PART OF UGM'S COMMITMENT) WILL BE CONTINUED
- DEVELOPING AND PROMOTING A **ROLE MODEL OF AGRICULTURAL LEARNING CENTRE** REGARDING STRAW MANAGEMENT IN THE PILOT LOCATIONS: TECHNOLOGY TRANSFER, KNOWLEDGE CENTER, TRAINING AND LEARNING CENTER
- STRENGTHENING **FARMERS'S GROUP ORGANIZATION** AND FUNCTIONAL IN ORDER TO REACH A SELF-RELIANT IMPLEMENTATION OF AGRICULTURAL MECHANIZATION AND STRAW MANAGEMENT'S BUSSINESS FOR THE FARMERS
- TO FORMULATE FURTHER RECOMMENDATION IN TERMS OF **REGULATION OR POLICY REGARDING TO STRAW RESIDUE MANAGEMENT** TO THE LOCAL GOVERNMENT BASED ON THE DIRECTION FROM THE THREE PILOT SITES AS REFERENCE.
- IN THE FUTURE, THE THREE PILOT SITES WILL BE PLANNED TO BE A FIELD LABORATORY / EXPERIMENTAL AND **AGRICULTURAL MECHANIZATION LEARNING CENTRE** TO SUPPORT COMMUNITY SERVICES AND STUDENT ACADEMIC COMPETENCIES.

FOLLOW-UP ACTIVITY: SELF-CONTRIBUTION OF PARTICIPANTS AFTER PROGRAM

- EXAMPLE: FARMERS GROUPS AND THE COMMUNITY IN JAPUHAN HAMLET ARE IN PROGRESS FOR BUILDING **STORAGE FOR THE MACHINERY** AS THEIR SELF-CONTRIBUTION AND GRATITUDE

MODEL OF AGRICULTURAL **MECHANIZATION LEARNING CENTRE**

GOVERNMENT POLICY

HUMANITY TECHNOLOGY
BASED MECHANIZATION

"LEARNING ORGANIZATION"
BASED INSTITUTION

QUALIFIED HUMAN
RESOURCES

AGRICULTURAL MACHINERIES
INDUSTRY

SUPPORTING
INFRASTRUCTURES


UNITED NATIONS
ESCAP
Economic and Social Commission for Asia and the Pacific
CSAM
UNIVERSITAS
GADJAH MADA
ESCAP CSAM
PANEN RAYA DAN PENYERAHAN
ALAT DAN MESIN PERTANIAN
Enabling Sustainable and Climate-Smart Agriculture
in Indonesia Through Mechanization Solutions for
Integrated Management of Straw Residue
Januari 2023