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APPENDICES

APPENDIX A

Introductory Workshop Notes

Identification of Technical Practices for Climate-Smart Agriculture (CSA) in Indonesia

Project Reference: CTCN 22-011

Introductory Workshop with NDE and Project Proponent

Date: 16 February 2023 (9.00 am to 1.00 pm)
Place: Four Points by Sheraton Hotel, Jakarta

Participants:

Dr M Nasir Rofiq (Mr)	National Research and Innovation Agency (BRIN)
Hismiady Bahua (Ms)	National Research and Innovation Agency (BRIN)
Agam Wira Sani (Mr)	National Research and Innovation Agency (BRIN)
Dr Lukita Devy (Ms)	National Research and Innovation Agency (BRIN)
Aminah (Ms)	Ministry of Environment and Forestry of the Republic of Indonesia
Khurnia T.U (Ms)	Ministry of Environment and Forestry of the Republic of Indonesia
Adisthi Fobrianty (Ms)	Ministry of Environment and Forestry of the Republic of Indonesia
Nurul (Ms)	Ministry of Environment and Forestry of the Republic of Indonesia
Ayang Aikep (Ms)	Ministry of Environment and Forestry of the Republic of Indonesia
Syed Mohazri Syed Hazari (Mr)	DHI Malaysia
Asep Sukmara (Mr)	DHI Indonesia
Riyandi Nuswantoto (Mr)	DHI Indonesia
Anom Sulardi (Mr)	DHI Indonesia
Dina Ariani (Ms)	DHI Indonesia
Dr. Satyanto Krido Saptomo (Mr)	*Departmen Teknik Sipil dan Lingkungan, Fateta, IPB University*
Dr. A. Faroby Falatehan (Mr)	*Departemen Ekonomi Sumberdaya dan Lingkungan, FEM, IPB University*
Sriwulan Ferindian (Ms)	*Departemen Komunikasi dan Pengembangan Masyarakat, FEMA, IPB University*
Dr. Arien Heryansyah (Mr)	*Fakultas Teknik dan Sains, UIKA Bogor*

Agenda:

1. Project background
2. Introduction of the implementation team and experts
3. Project schedule
4. Main project outputs
5. Preliminary findings for Output 1

Meeting material:

Presentation deck by DHI (attached).

Notes:

Item	Discussion Notes	Remarks
1.0	The workshop was conducted in both Bahasa Indonesia and English. The workshop was moderated by Mr Asep Sukmara and started at 9.30 am (Jakarta time) with introductions of the meeting participants. It was officially opened by Dr M Nasir Rofiq of BRIN.	-
2.0	A presentation on the project implementation approach was done by Mr Syed Mohazri with the following main points:	-
	a) Implementation arrangement: • Project Manager: Syed Mohazri Syed Hazari • Deputy Project Manager: Maija Bertule • National Coordinator: Asep Sukmara	-
	b) International and national experts: • CSA design: Dr Satyanto Krido Saptomo • Agriculture finance: Dr A Faroby Falatehan • Gender: Ms Sriwulan Ferindian • Agriculture engineer: Dr Arien Heryansyah • Remote sensing: Dr Radoslaw Marcin Guzinski	-
	c) The national designated entity (NDE) and project proponent (PP) will have a guidance and consultative role.	-
	d) The project objective is “to identify and design suitable CSA technologies and associated systems for enhancing climate change adaptation in the agriculture sector in Indonesia”. Findings from the TA will facilitate the implementation and replication of CSA technologies in Indonesia, supporting the achievement of its National Adaptation Plan (NAP) goals and strategies. Specifically, the TA focuses on the followings: • The use of sensors that can identify water content and soil chemistry on agricultural land • Automation of watering and fertilizing tools according to land requirements.	-
	e) The project duration is 12 months. The timeline as per the signed Contract is from 24 October 2023 to 24 October 2024. However, since the Inception Meeting was only conducted on 13 January 2023, the project timeline has been modified to start on 13 January 2023 and end on 31 January 2024.	No objection was received from both NDE and PP on the new project timeline.
	f) Mandatory outputs to be submitted are: • Detailed implementation plan • Monitoring and evaluation plan • Initial impact statement • Final impact statement • TA closure plan	-
	g) Main outputs of the project are: • Output 1: Map stakeholders and organize an inception meeting	-

Item	Discussion Notes	Remarks
	• Output 2: Identify technologies to support the identification of water content and soil chemistry on agricultural land • Output 3: Identify technologies for automatic irrigation and fertilizer application and design an integrated system for the suitable conditions as per the geographic location selected • Output 4: Analyse market potential and cost-benefit of the fully integrated system • Output 5: Train governmental bodies in CSA practices and the fully integrated system	
3.0	Proposed dates to deliver the deliverables were also presented.	-
4.0	The Workshop proceeded with discussing the preliminary findings of Output 1 focusing on the stakeholders mapping (to identify potential working group members) and the identification of a geographical area in Indonesia to contextualise the technology.	-
5.0	Suggestions and recommendations during the discussion are as follows:	-
	<u>Potential Geographical Area</u>	
	a) Additional criterion to consider when assessing a potential area is whether the area is already part of the *Program Kampung Iklim (ProKlim)* (Climate Village Programme) initiative by the Ministry of Environment and Forestry.	NDE informed that Bali can be a potential area as there is already a village under the ProKlim initiative.
	b) Crop type should be one of the main criteria for consideration of the area.	Paddy, corn and sugarcane were shortlisted as possible crop types.
	c) Total production should also be considered as a criterion.	-
	<u>Potential Working Group Members:</u>	
	d) The private sector should also be included in the working group.	-
	e) An NGO (particularly a women-based group) must be included in the working group.	-
	f) Potential members of the working group should not only be confined to Governmental agencies that are focused on policy and research. It should be expanded to those agencies that are focused on “application”.	-
	g) The Local Government (depending on where the location is selected) should also be part of the working group.	-
	<u>Other Issues</u>	
	h) NDE emphasised that the CSA technology to be proposed by the project should be able to reduce the	-

Item	Discussion Notes	Remarks
	GHG emission in agriculture to be in line with Indonesia's Nationally Determined Contribution (NDC).	
6.0	It was suggested that an online discussion will be carried out in the second week of March 2023 to further finalise the findings of Output 1, in order to ensure the working group is established in the soonest time possible.	-
7.0	The Workshop ended at 12.30 pm (Jakarta time).	-

IDENTIFICATION OF TECHNICAL PRACTICES FOR CLIMATE-SMART AGRICULTURE (CSA) IN INDONESIA

LOKAKARYA KONSULTATIF AWAL

HOTEL FOUR POINTS JAKARTA, 16 FEBRUARY 2023

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IDENTIFICATION OF TECHNICAL PRACTICES FOR CLIMATE-SMART AGRICULTURE (CSA) IN INDONESIA

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HOTEL FOUR POINTS JAKARTA, 16 FEBRUARY 2023

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17.							
18.							

Identification of Technical Practices for Climate-Smart Agriculture (CSA) in Indonesia

CTCN
UN Climate Technology Centre & Network
UNFCCC Technology Mechanism

UN environment programme | DHI
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1

Agenda

- TA Background and Implementation
- Main Outputs
  - Mandatory outputs
  - TA outputs
- Preliminary findings for Output 1
  - Stakeholders mapping for working group members
  - Proposed geographical area in Indonesia to contextual technology analysis

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TA Implementation

3

Background

- Title:
  - Identification of Technical Practices for Climate-Smart Agriculture (CSA) in Indonesia
- National Designated Entity (NDE):
  - Directorate General of Climate Change, Ministry of Environment and Forestry
  - Focal point: Ms Rizki Amelgia (Kiki)
- Project proponent
  - Badan Riset dan Inovasi Nasional (BRIN)
  - Focal point: Dr Dudi Iskandar

4

Background (cont'd)

- Objectives
  - to identify and design suitable CSA technologies and associated systems for enhancing climate change adaptation in the agriculture sector in Indonesia
  - Findings from the study will facilitate the implementation and replication of CSA technologies in Indonesia, supporting the achievement of the goals and strategies of its National Adaptation Plan
- Indicative technical interventions:
  - The use of sensors that can identify water content and soil chemistry on agricultural land
  - Automation of watering and fertilizing tolls according to land requirements

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Implementation arrangements

- Lead Implementation Agency: UNEP-DHI Centre on Water and Environment
- Project Manager:
  - Syed Mohazri Syed Hazari (DHI Malaysia)
- Deputy Project Manager:
  - Maija Bertule (UNEP-DHI Centre, Denmark)
- National support and logistics coordination:
  - Asep Sukmara (DHI Indonesia)

6

Experts

- Climate-smart agriculture design
  - Dr. Satyanto Krido Saptomo *(Departmen Teknik Sipil dan Lingkungan, Fateta, IPB University)*
- Agriculture finance
  - Dr. A. Faroby Falatehan *(Departemen Ekonomi Sumberdaya dan Lingkungan, FEM, IPB University)*
- Gender
  - Ms Sriwulan Ferindian *(Departemen Komunikasi dan Pengembangan Masyarakat, FEMA, IPB University)*
- Agriculture engineer
  - Dr. Arien Heryansyah *(Fakultas Teknik dan Sains, UIKA Bogor)*
- Remote sensing expert:
  - Dr Radoslaw Marcin Guzinski *(DHI Denmark)*

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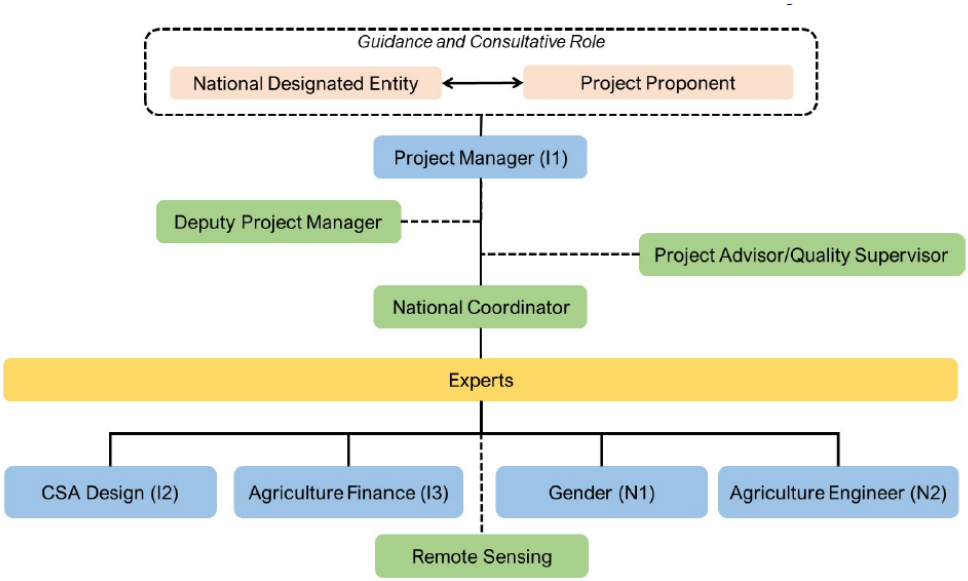
Implementation arrangements



8

Implementation Plan

- TA duration:
  - 12 months
- Contract timeline:
  - 24 October 2022 to 24 October 2023
- TA implementation timeline:
  - 13 January 2023 to 31 January 2024

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Main Outputs

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Main Outputs

- Mandatory outputs
- TA outputs

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Mandatory Outputs

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Mandatory Outputs

- Detailed implementation plan
- Monitoring and evaluation plan
- Initial impact statement
- Final impact statement
- TA closure plan

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TA Outputs

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Overall Output

- Output 1: Map stakeholders and organize an inception meeting
- Output 2: Identify technologies to support the identification of water content and soil chemistry on agricultural land
- Output 3: Identify technologies for automatic irrigation and fertilizer application and design an integrated system for the suitable conditions as per the geographic location selected
- Output 4: Analyse market potential and cost-benefit of the fully integrated system
- Output 5: Train governmental bodies in CSA practices and the fully integrated system

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Gender Element

- Gender is considered central to the implementation of the TA project, and will be mainstreamed in all relevant outputs and deliverables:
  - Ensuring a gender balance in the implementation team
  - Ensuring a dedicated gender expert in the project execution activities to ensure that aspects of gender mainstreaming are considered in the selection of technologies
  - Ensuring a gender balance in the project activities relating to the stakeholder working group and training
  - Ensuring gender is considered in main outputs and deliverables

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Approach

- Establish a stakeholder working group
  - Mapping of stakeholders
  - Selection of a suitable geographical location in Indonesia to contextualise the technology analysis
- Literature review
- Feasibility analysis of technologies
- Designing the macrosystem framework
- Identification of technologies for automatic irrigation and fertilizer application
- Market analysis and cost-benefit
- Gender analysis
- Meetings of the WG
  - Face-to-face
  - Virtual
- Workshop

17

Output 1

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Output 1

- Map stakeholders and organize an inception meeting
  - Three (3) activities
  - Four (4) deliverables

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Activities for Output 1

- **Activity 1.1:** Map stakeholders that are likely to be involved in CSA deployment in Indonesia
  - D1.1.1: Stakeholder analysis report *(24 February 2023)*
- **Activity 1.2:** Establish a stakeholder working group
  - D1.2.1: List of confirmed working group members *(3 March 2023)*
- **Activity 1.3:** Organize an inception meeting for the stakeholder working group
  - D1.3.1: Inception meeting *(17 March 2023)*
  - D1.3.2: Minutes of the inception meeting *(24 March 2023)*

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Output 2

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Output 2

- Identify technologies to support the identification of water content and soil chemistry on agricultural land
  - Five (5) activities
  - Eight (8) deliverables

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Activities for Output 2

- **Activity 2.1:** Identify existing technologies that provide data on water content and soil chemistry on agricultural land (vidiometry/drone/CCTV, etc.)
  - D2.1.1: Report summarising technology review findings *(21 April 2023)*
  - D2.1.2: Technology fact sheets *(21 April 2023)*
- **Activity 2.2:** Produce a feasibility analysis for the technologies
  - D2.2.1: Technology feasibility analysis report *(19 May 2023)*
- **Activity 2.3:** Organize a half-day meeting with the working group
  - D2.3.1: Virtual working group meeting *(26 May 2023)*
  - D2.3.2: Minutes of meeting of the working group *(2 June 2023)*

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Activities for Output 2 (cont'd)

- **Activity 2.4:** Design the macrosystem framework for the selected technology
  - D2.4.1: Draft report on the design of the macrosystem framework *(23 June 2023)*
- **Activity 2.5:** Organize a half-day meeting with the working group
  - D2.5.1: Virtual working group meeting *(7 July 2023)*
  - D2.5.2: Minutes of the meeting of the working group *(14 July 2023)*

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Output 3

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Output 3

- Identify technologies for automatic irrigation and fertilizer application and design an integrated system for the suitable conditions as per the geographic location selected
  - Four (4) activities
  - Five (5) deliverables

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Activities for Output 3

- **Activity 3.1:** Identify relevant technologies for automatic irrigation and fertilizer application
  - D3.1.1: A catalogue of technology factsheets for automatic irrigation and fertilizer application *(4 August 2023)*
- **Activity 3.2:** Produce a feasibility analysis for the integration of the two systems
  - D3.2.1: Report on the feasibility analysis for the integration of the two systems *(25 August 2023)*
- **Activity 3.3:** Organize a half-day meeting with the working group
  - D2.5.1: Virtual working group meeting *(8 September 2023)*
  - D2.5.2: Minutes of the meeting of the working group *(15 September 2023)*

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Activities for Output 3 (cont'd)

- **Activity 3.4:** Finalise the feasibility analysis for the integration of the two systems
  - D3.4.1: Final report on the design of the fully integrated system *(6 October 2023)*

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Output 4

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Output 4

- Analyse market potential and cost-benefit of the fully integrated system
  - Three (3) activities
  - Four (4) deliverables

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Activities for Output 4

- **Activity 4.1:** Analyse market potential and cost-benefit of the fully integrated system
  - D4.1.1: Draft report on the market potential analysis for the deployment of the fully integrated system *(3 November 2023)*
- **Activity 4.2:** Analyse cost-benefit and financing mechanisms for the deployment of the fully integrated system
  - D4.2.1: Draft report on the cost-benefit and financing mechanisms *(17 November 2023)*
- **Activity 4.3:** One-day in-person working group meeting
  - In-person meeting with the working group *(24 November 2023)*
  - Minutes of the working group meeting *(1 December 2023)*

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Output 5

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Output 5

- Train governmental bodies in the CSA practices and the fully integrated system
  - Two (2) activities
  - Four (4) deliverables

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Activities for Output 5

- Activity 5.1: Selection of the best CSA practices and associated financial mechanisms
  - D5.1.1: Consolidated training materials in English and Bahasa Indonesia *(5 January 2024)*
- Activity 5.2: Organize a two-day in-person workshop with the participation of contextual technology suppliers and the stakeholder working group. The workshop will include case presentations and consolidated findings from the technological analysis and associated financing mechanisms
  - D5.2.1: A two-day in-person workshop *(12 January 2024)*
  - D5.2.2: Concluding workshop report *(24 January 2024)*
  - D5.2.3: Satisfaction survey results *(31 January 2024)*

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Preliminary Findings for Output 1

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50

Activities for Output 1

- **Activity 1.1:** Map stakeholders that are likely to be involved in CSA deployment in Indonesia
  - D1.1.1: Stakeholder analysis report *(24 February 2023)*
- **Activity 1.2:** Establish a stakeholder working group
  - D1.2.1: List of confirmed working group members *(3 March 2023)*
- **Activity 1.3:** Organize an inception meeting for the stakeholder working group
  - D1.3.1: Inception meeting *(17 March 2023)*
  - D1.3.2: Minutes of the inception meeting *(24 March 2023)*

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Preliminary Findings – Output 1

- Stakeholders' mapping *(Activity 1.1 and Activity 1.2)*
  - Proposed working group members
- Proposed geographical area in Indonesia to contextual technology analysis *(Activity 1.3)*

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Stakeholders' Mapping

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53

Stakeholder mapping

- Stakeholder mapping was carried out with a literature study approach to obtain why, who, what, when, where, and how (5WH) to do activities related to the CSA
- As an additional criterion are stakeholders related to the role of women in agriculture
- Based on this analysis, 10 institutions were obtained that will be proposed as members of the working group, where 2 of them being project proponents (PP) from BRIN and National Designated Entities (NDE) from the Ministry of Environment and Forestry.

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54

No	Stakeholder Name	Roles in CSA	Institution	Prospective person	Gender
1	BRIN, Directorate of Research, Technology and Innovation Policy Evaluation	PP	BRIN	Dr. Dudi Iskandar	M
2	MoEF, DG of Climate Change (DJPPI)	NDE	KLHK	Pak Wawan Gunawan	M
3	Ministry of Women Empowerment and Children Protection: Directorate for Poverty Reduction	To assure community involvement (gender-sensitive) in program	KPPA	Dr. Agustina Erni	F
4	Ministry of Public Works and Housing, Balai Teknik Irigasi	Improving and maintaining irrigation infrastructure to increase the efficiency of water use in climate-resilient agricultural practices.	KPUPR	Pak Hanhan	M
5	Coordinating Ministry for Economic Affairs of the Republic of Indonesia, Deputy for Food and Agribusiness Coordination	monitoring, analyzing, evaluating, and reporting in the field of food and agribusiness	KemenKoE	Dr. Muzdalifah	F

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No	Stakeholder Name	Roles in CSA	Institution	Prospective person	Gender
6	Directorate General of Agricultural Extension and Human Resources (DGAEHR), Ministry of Agriculture	Facilitate smallholder with excellent extension who can provide assistant related CSA technology	Kementan	Bu Lena	F
7	Directorate General of Agricultural Infrastructure, Ministry of Agriculture	System of Rice Intensification (SRI) technology	Kementan	Bu Yani R	F
8	BRIN, Kel Riset Limnologi dan SDA	Conduct research and development activities to identify and develop CSA practices that can be adopted by farmers	BRIN	Dr Popi	F
9	Directorate General of Food Crops (DGFC), ~~BBPOPT~~, Ministry of Agriculture	Provide program support/input for smallholders regarding CSA's pillar	Kementan	cek	M
10	BRIN, Agricultural and Food Research Organization, Food Crop Research Kel	conduct research and development activities to identify and develop CSA practices that can be adopted by farmers,	BRIN	cek	M

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Proposed Geographical Area in Indonesia to Contextualise Technology Analysis

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Proposed Geographic Location

- Geographic location is selected based on several criteria:
  - **Water availability:** selected locations that still have water sources for agriculture
  - **Commodity:** with consideration of wider benefits sought location with food commodities
  - **Access:** highest location accessibility
  - **Climate:** selected locations with rainy days and low rainfall according to Oldemann
  - **Developing Village Index (IDM):** the technology designed will require an adequate level of human and village resource development
  - **Gender Empowerment Index (IDG):** paying attention to the potential participation of women in agriculture-related activities
  - **Topography:** locations with increasingly gentle topography will be easier to use

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58

No	Province	Region	Water	Commodity	Climate	Topography
1	NTB	Lombok Timur	Air Permukaan	Jagung	E4, D4	Landai - Curam
2	NTB	Sumbawa	Air Permukaan	Jagung	D3, D4	Landai
3	Jawa Timur	Jember	Air Tanah dan Permukaan	Tembakau	B2	Landai
4	Yogja	Gunung Kidul	Air Tanah	Palawija	B2	Berbukit
5	Jawa Tengah	Wonogiri	Kurang Air	Ubikayu, sawah, palawija	B2	Berbukit
6	Jawa Barat	Sukabumi	Air Permukaan	Palawija	B2	landai - Berbukit
7	Lampung	Lampung Selatan	Air Permukaan	Paddy	C1, A	Landai
8	Sumbar	Kota Pariaman	Air Permukaan	Perkebunan	A	Berbukit
9	Sulbar	Majene	Air Tanah dan Permukaan	Padi	C2, D2	Berbukit
10	Bali	Karang Asem	Air Permukaan	Padi, Ubikayu. Kedelai	E4, D4	Landai - berbukit

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Discussion

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60

Thank you

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61

APPENDIX B

Literature Analysis on CSA Practices in Indonesia

B Matrix of Literature Analysis on CSA Practices in Indonesia

No	Who	Why	What	How	When	Where	Reference
1	https://www.sustainable-landscape.org/	Climate change is one of the factors that will reduce agricultural production by 16% while to meet food needs it is necessary to increase production by 70% by 2050	LANSKAP MERAPI: Managing farmland for climate change mitigation with Climate-Smart Agriculture (CSA)	The practice of *wana tani* is one of the government's choices to increase food production. The Central Java Provincial Government and the Wonogiri Regency Government are working together to develop a farmer *wana* system in Tempursari Village, Wonogiri Regency. The programme covers an area of 25 hectares. In this *wana tani* programme, the people of Tempursari Village grow food crops in rotation under forest plants. Plant types for the programme include cassava, corn, elephant grass, and teak trees.	2016	Taman Nasional Gunung Merapi covers the area of 4 districts and 18 sub-districts.	Sustainable Landscape Newsletter. Edition 3 December 2016 Light Version. Business watch indonesia
2	Indonesian Agricultural Research Center and funded by GIZ in collaboration with ICRAF.	Tackling climate change in the agricultural sector as an approach to increase rice productivity and reduce greenhouse gas (GHG) emissions, economically feasible, socially acceptable and appropriate for policy support. Paddy rice cultivation produces 95% of rice but also produces quite high greenhouse gas emissions, especially methane (CH_4) due to water regulation; which emits 58.618 million tons of CO_2 per year.	Climate smart agriculture to increase productivity and reduce greenhouse gas emission-a preliminary study	The pilot plot was used to compare Farmer practices with CSA technology. The CSA technology used is a leaf color chart for N fertilization, a rice field soil test tool for determining basic fertilizers, organic matter reformer and intermittent irrigation	2018	Jawa Tengah, : Kabupaten Banjarnegara, Purbalingga dan Banyumas	M Ariani, A Hervani, P Setyanto. 2016. Climate smart agriculture to increase productivity and reduce greenhouse gas emission-a preliminary study. IOP Conf. Series: Earth and Environmental Science 200 (2018) 012024
3	Kementerian PPN/Bappenas	The reduction of agricultural land as a result of rapid population growth and needs and the reduction of human resources of agricultural managers, are important factors causing reduced food security. Efforts are needed to improve food security and mitigate the impacts of climate change on agriculture	Development of productivity of Batang Alai reservoir to tertiary	The method used is Climate-Smart Agriculture (CSA) is an integrative approach to increase productivity, increase resilience, and minimize greenhouse gas emissions. The research methods used are mixed, namely literature review, discussion with actors, and collecting information from the field. Field data is generated by field		Kabupaten Hulu Sungai Tengah Provinsi Kalimantan Selatan	Kementerian PPN/Bappenas. Sub Tema 4. Menguatkan Kerangka Kebijakan Pembangunan Berkelanjutan (SDGs) dalam Perencanaan Pembangunan Daerah Jangka Menengah dan Panjang.

No	Who	Why	What	How	When	Where	Reference
		and agriculture with sustainability principles, both at the agricultural and food system levels.		surveys, namely interviews with agricultural actors and taking location coordinates using GPS tools			
4	Information Systems Department. Faculty of Information and Communication Technology. Institut Teknologi Sepuluh Nopember	Climate change will generally have an impact on the degradation or decline of the functioning of agricultural resources such as land, water, and agricultural infrastructure. For example, in 2015 an area of 20,978 hectares of agricultural land was affected by drought and an area of 1,319 hectares of paddy fields that failed to harvest due to flooding in East Java	Creation of climate-smart agriculture models for adaptation and building resilience to climate change in rice production (case study: East Java).	CSA's approach to adaptation and building climate change resilience, some of the things that can be done are by regulating inputs in agricultural systems such as seedlings, irrigation or irrigation, fertilization, and tillage which are included in the practice of crop management, soil management, and watermanagement.	2018	Jawa Timur	Akmal Faza. 2018. Pembuatan model climate-smart agriculture untuk adaptasi dan membangun ketahanan terhadap perubahan iklim dalam produksi padi (studi kasus: jawa timur). Departemen Sistem Informasi. Fakultas Teknologi Informasi dan Komunikasi. Institut Teknologi Sepuluh Nopember. Surabaya
5	Center for the Study of Agricultural Technology in West Papua.	Climate change can lead to the decline and stagnation of agricultural production that threatens food security and human survival.	CLIMATE SMART AGRICULTURE (CSA) APPROACH IN BUILDING CLIMATE CHANGE ADAPTIVE AGRICULTURE MODELS AND RESEARCHER-EXTENSION SYNERGY PATTERNS IN THE DISSEMINATION OF TECHNOLOGICAL INNOVATIONS	1. Increasing Agricultural Productivity and Income Sustainably, namely multicultural system crop cultivation combines the diversity of genetic resources and the support of climate change adaptive technology innovations. 2. Adaptation and Building Resilience to Climate Change by increasing farmers' understanding of predicting climate change, related to changes/shifts in rain patterns, dry seasons, rainy seasons, vulnerability of regions and agricultural systems to climate stress, the possibility of exploding pests of plant/livestock diseases, and so on that can affect production levels, food security, and farmers/ranchers' incomes. 3. Reduction of Greenhouse Gas (GHG) Emissions, namely using crops and cultivation techniques/models that are low in GHG emissions and adaptive to climate change. Teknik cultivation of crops and livestock, low feed composition of greenhouse gas	2018	Papua	Aser Rouw. 2018. Pendekatan climate smart agriculture (csa) dalam membangun model pertanian adaptif perubahan iklim dan pola sinergi . Buletin Agro-Infotek 4 (1) : 13-21

No	Who	Why	What	How	When	Where	Reference
				emissions, as well as waste treatment technology.			
6	Stéphane Le Foll, Patrick Caron, Emmanuel Torquebiau	The right mode of governance of agricultural activities is indispensable to ensure that the climate crisis does not turn into a disaster to agricultural systems that must be responded to by the development of technological innovations	Agriculture et changement climatique : un mariage de raison inéluctable		2010		Stéphane Le Foll, Patrick Caron, Emmanuel Torquebiau. Agriculture et changement climatique : un mariage de raison inéluctable. Cah. Agric., 27 4 (2018) 41001 DOI: https://doi.org/10.1051/cagri/2018027
7	DIREKTORAT SISTEM DAN STRATEGI PENGELOLAAN SUMBER DAYA AIR World Bank (WB) dan Asian Infrastucture Investment Bank (AIIB)	The SIMURP method is an activity that can handle the modernization and rehabilitation of irrigation networks	Strategic Irrigation Modernization and Urgent Rehabilitation Project.	Revitalization of irrigation management, Modernization of Irrigation Management. The components of SIMURP activities generally consist of three components, namely: (a) Component A (Rehabilitation of Irrigation Systems and Urgent Drainage, focused on the rehabilitation of irrigation systems in 14 Irrigation Areas); (b) Component B (Modernization of Strategic Irrigation and Drainage Systems, focused on modernizing strategic Irrigation Areas in Jatiluhur); and (c) Component C of Project Management and Consulting Services.	2020	13 Daerah Irigasi/DI dan 2 (dua) Daerah Rawa/DR (DR Karang Agung Hilir dan DR Katingan I) di 8 (delapan) provinsi dan 17 kabupaten	Direktorat sistem dan strategi pengelolaan sumber daya air. 2020. Buku 6 project operation manual. Pertanian Cerdas Iklim Climate Smart Agriculture. Kementerian PUPR. DIREKTORAT JENDERAL SUMBER DAYA AIR
8	A. Fallot. 2016	continuous increase in productivity; building resilience; Mitigation of greenhouse gas emissions.	Climate-smart agriculture 2015		2015	Prancis	A. Fallot. 2016. Climate-smart agriculture 2015. Natures Sciences Sociétés, 24, 151-153 (2016)
9	Emmanuel Torquebiau et al. 2018.	The CSA's approach drives coordinated action by farmers, researchers, the private sector, civil society, and policymakers towards a climate resilient path through four key areas of action: evidence-building; improving the effectiveness of local institutions; encourage coherence between climate and agricultural policies; linking climate finance and agriculture	Identifying climate-smart agriculture research needs	permanent soil cover, agroforestry, crop rotation (especially with legumes), organic fertilizers, conservation agriculture, agroecology, precision agriculture, better grazing practices and animal feed quality, integrated soil fertility management, and improved water management.	2018		Emmanuel Torquebiau, Cynthia Rosenzweig, Allison M. Chatrchyan, Nadine Andrieu, Raj Khosla. 2018. Identifying Climate-smart agriculture research needs. Cah. Agric. 2018, 27, 26001

No	Who	Why	What	How	When	Where	Reference
10	R.B. Zougmoré et al. 2018. CGIAR Research Programme on Climate Change, Agriculture and Food Security (CCAFS), Wageningen, Netherlands	Water resources for agriculture are becoming increasingly unpredictable due to increasing climate variability. Climate change and variability will affect agricultural output, food security, and increase poverty	Facing climate variability in sub-Saharan Africa: analysis of climate-smart agriculture opportunities to manage climate-related risks	building the adaptive capacity of agricultural systems to climate change and variability. agroforestry, water harvesting techniques, integrated soil fertility management practices. The use of intermittent irrigation for stagnant rice has made water used efficiently and yields have increased significantly. The SRI system has been highly adopted as a climate-smart choice in about 20 African countries, the application of solar drip irrigation technology	2018	Afrika barat, tengah, dan timur, Afrika Selatan	Robert B. Zougmoré, Samuel T. Partey, Mathieu Ouédraogo, Emmanuel Torquebiau, Bruce M. Campbell. 2018. Facing climate variability in sub-Saharan Africa: analysis of climate-smart agriculture opportunities to manage climate-related risks. Cah. Agric. 2018, 27, 34001.
11	Philippe Debaeke, 2017	Climate change, particularly rising temperatures, changing rainfall patterns, and climate variability (including extreme climate events) will dramatically affect crop productivity and its regional distribution in the coming decades with severe impacts on food security. changes in water availability patterns and additional irrigation needs which will further affect agricultural productivity	Climate-smart cropping systems for temperate and tropical agriculture: mitigation, adaptation and trade-offs	The selection of varieties that better adapt to drought is long-term adaptation to climate change. Short-term strategies have been identified such as setting up planting schedules, introducing new varieties and cultivars, diversifying rotations, integrated new soil management and fertilization practices, introduction or expansion of irrigation.	2017		Philippe Debaeke, Sylvain Pellerin, Eric Scopel. 2017. Climate-smart cropping systems for temperate and tropical agriculture: mitigation, adaptation and trade-offs. Cah. Agric. 2017, 26, 34002
12	Kinfe Asayehegn et al. 2017	One of the most widespread anthropogenic challenges affecting agricultural production is climate change and climate variability. Environmental dynamics and climate change are contributing factors to the decline in production. Precipitation tends to decrease while hot periods become more common. As a result coffee plants tend to dry out, while pests and diseases appear.	Perception of climate change and farm level adaptation choices in central Kenya	crop-livestock diversification (MIX), varietal change (VAR), irrigation (IRR), variety change and irrigation (VARIRR), and crop-livestock diversity, varietal change and irrigation (MIXVARIRR)	2014,	Kenya tengah	Kinfe Asayehegn, Ludovic Temple, Berta Sanchez, Ana Iglesias. 2017. Perception of climate change and farm level adaptation choices in central Kenya. Cah. Agric. 2017, 26, 25003
13	Emmanuel Torquebiau. 2017	The CSA is an approach that allows accounting for the challenges of climate change with innovative	Climate-smart agriculture : pour une agriculture climato-compatible	sustainable soil and water conservation such as intermittent irrigation, water harvesting, erosion control, organic matter	2015	Prancis	Emmanuel Torquebiau. 2017. Climate-smart agriculture : pour une agriculture climato-compatible. Cah. Agric. 2017, 26, 66001

No	Who	Why	What	How	When	Where	Reference
		public policies and financing.		enrichment, biodiversity enhancement, intercropping, and agroforestry.			
14	Arun Khatri-Chhteri, P.K Aggarwal, P.K. Joshi, S. Vyas	Researching factors that can influence farmers to apply Climate Smart Agriculture (CSA) technology in their daily activities	Farmers' prioritization of climate- smart agriculture (CSA) technologies	This study used a preference method to analyze the results of farmers' choices related to CSA technology in several rainfall zones in the study area	2017	16 villages in Rajasthan area, India	Arun Khatri-Chhteri, P.K Aggarwal, P.K. Joshi, S. Vyas. 2017. Farmers' prioritization of climate- smart agriculture (CSA) technologies. Agricultural System, 2017
15	N. Andrieu, B. Sogoba, R. Zougmore, F. Howlanda, O. Samake, O. Bonilla-Findji, M. Lizarazo, A. Nowak, C. Dembele, C. Corner-Dolloff	productivity and growth of the agricultural sector in the country of Mali. which tends to be hit more often by summer/dry seasons, The application of Climate Smart Agriculture (CSA) is carried out to increase production, increase resilience, and also prioritize agriculture with low emissions.	Prioritizing investments for climate-smart agriculture: Lessons learned from Mali	The method used by the Malian government in implementing CSA is to create a framework for CSA priorities called the Climate Smart Agriculture Prioritization Framework (CSAPF).	2017	Mali	N. Andrieu, B. Sogoba, R. Zougmore, F. Howlanda, O. Samake, O. Bonilla-Findji, M. Lizarazo, A. Nowak, C. Dembele, C. Corner-Dolloff. 2017. Prioritizing investments for climate-smart agriculture: Lessons learned from Mali. Agricultural System, 2017
17	Ditjen Tanaman Pangan-Kementerian Pertanian	Fertilizer price is expensive, while government's attentios was decreased.	Sustainability	Promote SRI for organic Farming	2022	Indonesia	Marwanti. 2022. System of Rice Intensification (SRI): solusi budidaya padi sehat bekelanjutan. Ditjen Tanaman Pangan- Kementerian Pertanian website. September 20. [How and why to upscale SRI in Indonesia. Short piece on the Dept. of Agriculture's website]
18	Fakultas MIPA, Universitas Padjadjaran	Conventional rice cultivation methods are considered less effective in increasing rice production in Indonesia, not adaptive to pests and diseases and climate change.	Cultivation of rice plants using the System of Rice Intensification (SRI) method	Practice agroecological methods through the SRI method, reducing the use of chemical fertilizers and pesticides.	2022	Indonesia	Febri Doni, Mia Miranti, Novizar Nazir. 2022. System of Rice Intensification in Indonesia: Research, Adoption and Opportunities. Journal of Rice Research 2022. https://doi.org/10.58297/HZNE3472
19	Nippon Koei Consultant Team, Decentralized Irrigation System Improvement Project in Eastern Indonesia (DISIMP), Jakarta office, Jl. Sultant Hasanuddin 45, Jakarta 12160, Indonesia.	Conventional cultivation methods reduce the productivity of land and water resources.	Sri method rice crop cultivation and intermittent irrigation	Practice of SRI method, use of certified seed seeds, wading through the use of chemical fertilizers and intermittent irrigation methods	2002-2006	Nusa Tenggara Barat.	Shuichi Sato, Norman Uphoff. 2007. Review : A review of on-farm evaluations of system of rice intensification methods in Eastern Indonesia. CAB Reviews: Perspectives in Agriculture, Veterinary Science, Nutrition and Natural Resources 2007 2, No. 054
20	Fakultas Teknologi Pertanian, Universitas Gadjah Mada	Rainfall patterns largely determine planting schedules and crop yields (agricultural crop production is very sensitive to climate change)	Correlation analysis of rainfall and crop yield patterns, determination of crop patterns based on water balance analysis	Rainfall analysis in 2014, 2015 and 2016, identified the yield of each sub-district, and the planting pattern scenario in each sub-district that had a significant index.	2016	Kabupaten Banyumas, Jawa Tengah, Indonesia	Nugroho, B. D. A., Nuraini, L. 2016. Cropping Pattern Scenario based on Global Climate Indices and Rainfall in Banyumas District, Central Java, Indonesia. Agriculture and Agricultural Science Procedia, 9, 54–63. doi:10.1016/j.aaspro.2016.02.124
21	Fakultas Teknologi Pertanian, Universitas Gadjah Mada	Rainfall variability is a major agricultural problem in the highlands, caused by erratic water due to less rainfall. Improved cropping system	Improvement of planting system management	Combination and determination of planting patterns with rainfed irrigation systems.	2015	Kecamatan Saptosari dan Tanjungsari Kabupaten Gunungkidul	Bayu Dwi Apri Nugroho, Rizki Maftukhah. 2015. The effects of cropping methods on growth. crop index and yield response to water of rice (Oryza sativa L.) in rainfed agriculture. Journal of Agricultural Science and Technology B 5 (2015) 376-382 doi: 10.17265/2161-6264/2015.06.002

No	Who	Why	What	How	When	Where	Reference
		management can increase crop productivity					
22	Fakultas Teknologi Pertanian, Universitas Gadjah Mada	Agricultural conditions in Indonesia are influenced by rainfall distribution patterns.	Estimating the effect of El Niño events on agriculture using statistical imagery and satellite imagery	Estimating the impact of rainfall changes on rice crop production every 3 years	2016	Yogyakarta	Bayu Dwi Apri Nugroho. 2016. Using Satellite Image to Estimate the Effects of El Nino Occurrence on Agriculture in Gunung Kidul. Yogyakarta. Indonesia. Journal of Advanced Agricultural Technologies Vol. 3, No. 4. doi: 10.18178/joaat.3.4.281-285
23	Agricultural Human Resources Extension and Development Agency, Ministry of Agriculture	Efforts are needed to meet the needs of rice from domestic rice production and suppress and eliminate rice imports	System of Rice Intensification (SRI) technology	Extensibility and intensification of rice crop land with the application of innovative rice cultivation technology sri method	2022	Wonosari, Kabupaten Klaten, Jawa Tengah	Yayuk Sri Rahayu. 2022. Budidaya Padi Dengan Pendekatan Teknologi Sri (system Of Rice Intensification). Badan Penyuluhan dan Pengembangan SDM Pertanian, Kementerian Pertanian
24	IPB	The slowdown in the growth rate of national rice production is caused by competition in land use, extreme climate change, degradation of agricultural resources, limited support for agricultural infrastructure and the absence of significant breakthroughs in rice technology	System of Rice Intensification (SRI) technology	Application of the SRI method to rice cultivation and its efficiency analysis	2015	Kabupaten Solok Selatan	Joko Adrianto, Harianto, M. Parulian Hutagaol. 2016. Peningkatan produksi padi melalui penerapan sri (system of rice intensification) di Kabupaten Solok Selatan. Jurnal Agribisnis Indonesia . Vol 4 No 2 : 107-122. https://doi.org/10.29244/jai.2016.4.2.107-122
25	Universitas Pembangunan Nasional "Veteran" Yogyakarta	Key factors to achieve the target of food self-sufficiency are the efficient use of irrigation water, the ability of farmers to use the right amount of fertilizer, and the low rate of pest infestation.	teknologi System of Rice Intensification (SRI)	Field trials of SRI method of paddy rice plants	2017	Yogyakarta	Poerwanto, M.E., Padmini, O.S. (2017). Impact of "System of Rice Intensification" on the Abundance of Rice Pests. In: Isnansetyo, A., Nuringtyas, T. (eds) Proceeding of the 1st International Conference on Tropical Agriculture. Springer, Cham. https://doi.org/10.1007/978-3-319-60363-6_15
26	Ministry of Agriculture Republic of Indonesia	Urban farming can increase horticultural seed sales by up to five times.	Horticultural Village development programme through the application of hydroponic technology	The assistance provided is in the form of chili seeds, onion seeds, organic fertilizers and environmentally friendly pest control yellow sticky	2020	Indonesia	Kementan: Urban Farming Dukung Pertumbuhan Ekonomi Indonesia. https://www.pertanian.go.id/home/?show=news&act=view&id=4691
27	IPB	The application of the SRI method can increase water productivity in paddy fields. The combination of aquaculture and water management is needed to save water and increase rice production	Subsurface evapotranspiration irrigation system and rice cultivation SRI system	Application of SRI method and irrigation technology	2018-2021	Indonesia	Hilda Agustina, Budi Indra Setiawan, Sugiyanta, Mohamad Solahudin, Vita Ayu Kusuma Dewi. 2022. Subsurface Evapotranspiration Irrigation System Design in System of Rice Intensification (SRI) Salibu Paddy Cultivation. Asian Journal of Applied Sciences. 10 (1). ISSN: 2321-0893. https://ajouronline.com/index.php/AJAS/article/view/6891
28	Kompasiana	Urban Farming is one of the adaptive agricultural technologies that is a trend for urban people	Filling empty areas/spaces in meeting the food needs of the city community.	Utilizing several types of municipal waste into organic fertilizer intended for plants in a stammering areas.	2021	Indonesia	La Ode Ahmar. 2021. Urban Farming ; Keunggulan dan (Potensi) kelemahannya. https://www.kompasiana.com/laodeahmar/619f291306310e7b3d2a5a84/urban-farming-keunggulan-dan-potensi-kelemahannya

No	Who	Why	What	How	When	Where	Reference
29	Digitani IPB	Urban farming has a role to meet the food needs of urban communities	Optimizing owned land or agricultural intensification	Utilizing a dominant land area of 100-500 m2.	2022	Indonesia	Indri Mariska. 2022. Urban farming: solusi bertani untuk masyarakat perkotaan. https://digitani.ipb.ac.id/urban-farming-solusi-bertani-untuk-masyarakat-perkotaan/
30	Dinas Pertanian dan Ketahanan Pangan	Green open space crisis, maintaining urban food security,	The concept of gardening on limited land or growing crops in an urban home environment	Application of organic planting systems that do not use synthetic chemical fertilizers and pesticides.	2020	Jawa Timur	Iva Fachmawati,2020. Urban Farming Pertanian Kota Masa Depan. http://cybex.pertanian.go.id/artikel/94624/ urban-farming-pertanian-kota-masa-depan/
31	The Jakarta Post	Urban food crisis	Hydroponic technology, minapadi, poultry cultivation	Utilization of home area / yard to apply hydroponic or tabulampot plant cultivation	2020	Indonesia	The Jakarta Post. 2020. Urban farming a solution to food security issues during pandemic. https://www.thejakartapost.com/news/2020/10/27/ urban-farming-a-solution-to-food-security-issues-during-pandemic.html
32	Dailysocial	Urban food crisis	Hydroponic and tabulampot technology	Utilization of home area / yard to apply hydroponic or tabulampot plant cultivation	2020	Indonesia	Bintoro Agung. 2020. Melirik "Urban Farming" Sebagai Peluang Bisnis Baru Agritech. https://dailysocial.id/post/urban-farming-indonesia-agritech.
33	Popmama.com	Urban food crisis	Aquaponics, hydroponics, kale and catfish cultivation in buckets, verticulture, and wall garden or wall gardening	Utilizing open space into productive green land	2021	Indonesia	Rendy M. Muthaqin. 2021. 5 Metode Urban Farming yang Bisa Diterapkan di Rumah Perkotaan. https://www.popmama.com/life/home-and-living/rendy-muthaqin/ metode-urban-farming-yang-bisa-diterapkan-di-rumah-perkotaan
34	Imga agro	Imbalance in the availability and need for urban foodstuffs	Cultivation of horticultural crops in the yard of the house	Utilizing the yard area into an urban mini-garden and reducing the sleeping land.	2020	Indonesia	LMGA Agro. 2020. Urban farming dan perkembangannya di Indonesia. https://lmgaagro.com/2020/01/25/urban-farming-indonesia/
35	Master of Environmental Science Study Programme. Postgraduate Programme at Padjadjaran University	Urban food crisis	Cultivation of ornamental and horticultural crops in urban vacant land	Utilizing open space into productive green land	2015	Jakarta, Bandung dan Bogor	Zulfadhli Nasution. 2015. Komunitas Urban Farming Dan Kedaulatan Pangan: Studi Kasus Di Jakarta, Bandung dan Bogor. Program Studi Magister Ilmu Lingkungan. Pascasarjana Universitas Padjadjaran. https://pustaka.unpad.ac.id/wp-content/uploads/2015/11/ Artikel-Ilmiah-Zulfadhli-Urban-Farming-and-Food-Sovereignty.pdf
36	Surabaya City Food and Agriculture Security Office	The agricultural development that has been carried out at this time is still limited to handling paddy fields, while the optimization of yard land has not received much attention	Cultivation of vegetable crops, tabulampot (potted fruiting plants), and toga plants	Utilizing narrow land by cultivating plants that are useful for their own food sources	2019	Surabaya	Olivia Agustin. 2020. Implementasi Program Urban Farming Dinas Ketahanan Pangan Dan Pertanian Kota Surabaya.
37	Surabaya City Food and Agriculture Security Office	Lack of jobs and increasing number of basic food needs	Lack of jobs and increasing number of basic food needs	Assistance in the form of seeds (mustard greens, spinach, kale), seedlings (lombok, eggplant, tomatoes), liquid organic fertilizer and planting media in the form of (soil, polybags and compost)	2016	Surabaya	https://media.neliti.com/media/publications/164607-ID-program-urban-farming-sebagai-model-pena.pdf
38	Centre for Interdisciplinary Studies, Kolkata, India	Krisis bahan pangan	Teknologi System of Rice Intensification (SRI)	Application of organic SRI method in wetlands	2020	India	Deb, D. (2020). Is the system of rice intensification (SRI) consonant with agroecology? Agroecology and Sustainable Food Systems, 1–32. doi:10.1080/21683565.2020.1779165
39	Kelompok Wanita Tani	Limited open space or open ground for growing on a large scale	Commodity cultivation of annuals.	Utilizing the yard of the house for activities budidaya commodities of annuals including kale, spinach, chili, lettuce and other spices	2022	Kota Tasikmalaya	Desti Fitriani Rahmawati, Alifa Huaida, Aneu Octaviani, Ulfa Siti Maspupa. 2022. Pemanfaatan Media Sosial Untuk Pemasaran Hasil Urban Farming Pada Kelompok Tani Wanita. Jambura Journal of Community Empowerment (JJCE). 3 (1) :36-43. DOI:10.37411/jjce.v3i1.1294.

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40	Dinas Pertanian dan kelompok-kelompok tani	Increasing needs of urban people for food and land conversion into settlements	Konsep Rumah Pangan Lestari	Waste management around the area, increasing productivity with commodities through agroforestry systems, utilization of yards and sleeping land, creating a 'healthy lifestyle' in urban communities.	2019	Kelurahan Mulyaharja, Kelurahan Ranggamekar, dan Kelurahan Margajaya Kabupaten Bogor	Anisa Fitri Andiani. 2019. Kajian Urban Farming yang Berkelanjutan pada Masyarakat Kota Bogor. Departemen Arsitektur Lanskap. Fakultas Pertanian. Institut Pertanian Bogor. https://repository.ipb.ac.id/handle/123456789/100916
41	Universitas Internasional Batam	Economic conditions that are underprivileged and unable to produce their own food sources	Coastal design with urban farming instruments: tabulampot system cultivation	Creating a Mangrove Forest Tourism area and creating an additional source of income from potted plants planted by the villagers benefits for improving the economy of the people of Kampung Kelembak.	2020	Kepulauan Riau	Stivani Ayuning Suwarlan. 2020. Perancangan Urban Farming Pada Pesisir Kampung Kelembak Kepulauan Riau. Jurnal LINEARS.3 (1) : 20-25. DOI: https://doi.org/10.26618/j-linears.v3i1.3134.
42	22 perusahaan perkebunan kelapa sawit	The importance of food security improvement programmes through oil palm plantation development programmes	Cattle Palm Oil Integration System Programme Based on Plasma Core Livestock Business Partnership (SISKA KUINTIP), Bang Sibon Berkaret Program,	Development of beef cattle with a target of 1,000 head of cattle; Development of rubber plantations with double spacing patterns and intercropping with food crops	2023	Provinsi Kalimantan Selatan	Denny Susanto. 2023. 22 Perusahaan Ikut Program Pengembangan Sawit-Sapi di Kalsel. https://mediaindonesia.com/nusantara/555232/22-perusahaan-ikut-program-pengembangan-sawit-sapi-di-kalsel
43	PT Buana Karya Bhakti	National beef supply is often in deficit	Pengembangan integrasi sawit-sapi (SISKA)	Utilizing the potential of grass/weeds, meal, solid and palm leaves in oil palm plantation areas to become a cheap source of feed. Cow dung is used as an organic fertilizer and helps weeding weeds.	2023	Nasional	https://www.infosawit.com/2023/01/14/ diyakini-integrasi-sawit-sapi-bisa-berhasil/
44	PT Napindo Media Ashatama bekerja sama dengan IACCBP (Indonesia-Australia Commercial Cattle Breeding Programme); PT Buana Karya Bakti	The national beef supply is often in deficit and needs efforts to support meat and food self-sufficiency	Development of oil palm-cattle integration (SISKA)	Programme of 1000 oil palm cluster cattle villages	2020	Nasional	https://www.poultryindonesia.com/id/ indonesia-berpotensi-mengembangkan-bisnis-integrasi-sawit-sapi/
45	Dinas Perkebunan dan Peternakan Kalsel, PT Buana Karya Bhakti	Global food crisis, rising food prices and food security and Indonesia's food independence	Palm-Cattle Integration System Based on Plasma Core Livestock Business Partnership (Siska Ku Intip)	Planting HPT and grazing land, developing cattle by utilizing grass in plantation areas, as well as creating animal feed from palm oil waste, namely oil palm kernel meal.	2022	Provinsi Kalimantan Selatan	https://mediaindonesia.com/ekonomi/525486/ program-integrasi-sawit-sapi- di-kalimantan-selatan-jadi-percontohan-nasional
46	Petani mandiri dan Kelompok Tani Lampung	Independent oil palm farmers in Lampung do not get subsidized fertilizer	Palm oil organic fertilizer making programme	Using organic fertilizer by utilizing cow dung fermented with husk ash and EM4	2023	Lampung	https://www.mongabay.co.id/2023/02/09/ tanpa-pupuk-subsidi- petani-sawit-mandiri-lampung-tetap-garap-lahan/
47	Kementerian Pertanian; kelompok tani Tunas Baru yang ada di Desa Sungai Selan, Bangka Tengah, Kepulauan Bangka Belitung	Availability of quality feed that is still minimal	Program Integrasi Sawit-Sapi	Feed limitations can be met from palm oil waste management, by utilizing palm fronds as cow feed and cow waste (manure) as fertilizer for oil palm plants	2020	Provinsi Kepulauan Bangka Belitung	https://ditjenbun.pertanian.go.id/ integrasi-sawit-sapi-bantu-petani-penuhi-kebutuhan-hidup/

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48	Fakultas Pertanian, Universitas Tanjungpura	Increasing palm oil production will also increase the amount of palm oil waste produced. The consequence of the wider planting area and the increasing number of palm fruit processing plants is the increasing by-products of the palm oil industry which certainly have an impact on environmental pollution	Sistem Integrasi Kelapa Sawit dan Sapi (SISKA)	Pengolahan limbah kelapa sawit dan pengembangan pemanfaatannya sebagai pakan sapi. Pengembang Grazing di perkebunan sawit dan bioteknologi pakan untuk mendukung sentra pembibitan sapi	2022	Kalimantan Barat	https://untan.ac.id/sistem-integrasi-kelapa-sawit-dan-sapi-siska- untuk-mengakselerasi-kebutuhan-daging-di-kalimantan-barat/
49	Dinas Pertanian Bangka Belitung, T Putra Bangka Mandiri, PT Steelindo Wahana Perkasa, PT Robinmas Jaya, dan PT Tata Hamparan Eka Persada.	Ketersediaan pakan berkualitas yang masih minim	Program Integrasi Sapi-Sawit	Utilizing palm fronds as cow feed and cow waste (manure) as fertilizer for oil palm plants	2017	Provinsi Bangka Belitung	https://www.pertanian.go.id/home/?show=news&act=view&id=3952
50	Universitas Gadjah Mada	Climate change adversely affects plants, especially in terms of providing water for their productivity and development	Development of drought-tolerant gogo rice	Testing and observation of the morphological, physiological and biochemical character of gogo rice cultivated in greenhouses	2019	Nusa Tenggara Timur	Yustina Carolina Febrianti Salsinha, Didik Indradewa, Yekti Asih Purwestri, Diah Rachmawati. 2020. Selection of drought-tolerant local rice cultivars from East Nusa Tenggara, Indonesia during vegetative stage. Biodiversitas Journal of Biological Diversity. 21 (1). 170-178. https://smujo.id/biodiv/article/view/4391/3587
51	JICA-JST SATREPS, Pusat Konservasi Tumbuhan-Lembaga Ilmu Pengetahuan Indonesia (LIPI)	Climate change impacts water deficit for agricultural activitiesClimate change adversely affects plants, especially in terms of providing water for their productivity and development	Development of drought-tolerant varieties of sorghum crops	Testing of sorghum plants under water security and water feeding reference system field capacity value	2016	Greenhouse Puslit Bioteknologi Indonesia	W Widiyono, S Nugroho, A Rachmat, F Syarif, P Lestari, N Hidayati. 2020. Drought tolerant screening of 20 indonesian sorghum genotypes through leaf water potential measurements under water stress. IOP Conf. Series: Earth and Environmental Science 439 (2020) 012033. doi:10.1088/1755-1315/439/1/012033. https://iopscience.iop.org/article/10.1088/1755-1315/439/1/012033/pdf
52	Universitas Gajah Mada	Drought and lack of water will affect the physiological and metabolic of plants	Development of drought-tolerant rice	Testing and screening 21 local pigmented rice cultivars from Indonesia to improve drought tolerance by using transpirable groundwater fraction methods to provide precise control over drought stress imposed on plants	2022	Indonesia	Sebastian A, Nugroho IC, Putra HSD, Susanto FA, Wijayanti P, Yamaguchi N, Nuringtyas TR, Purwestri YA. Identification and characterization of drought-tolerant local pigmented rice from Indonesia. Physiol Mol Biol Plants. 2022 May;28(5):1061-1075. doi: 10.1007/s12298-022-01185-5. Epub 2022 Jun 2. PMID: 35722514; PMCID: PMC9203631.
53	Indonesian Agency for Agricultural Research and Development	Drought disrupts the generative phase and the process of rice panicle exit and causes crop failure	Agricultural Mitigation against Drought	Building climate change-adaptive agricultural systems. (1) Mapping commodities according to climate; (2) develop various types and varieties of genjah-aged, high-yielding, and tolerant plants to environmental stresses such as rising air temperatures, droughts, inundation (floods), salinity and toxic	2019	Indonesia	https://bbpopt.tanamanpangan.pertanian.go.id/index.php/2019/10/03/mitigasi-pertanian-terhadap-kekeringan/

No	Who	Why	What	How	When	Where	Reference
				substances, as well as attacks of various pests and diseases; (3) the application of climate information as a basis for planning and decision making; (4) develop tillage and crop technology to improve plant adaptability; (5) develop a system of protecting farms from crop weather insurance.			
54	Reno seprama, Penyuluh Pertanian WKPP Koto Tinggi, Kecamatan Koto Besar, Kabupaten Dharmasraya. Sumatera Barat	Drought conditions pose a serious threat to the ability of plants to grow and develop or even lead to death	Drought conditions pose a serious threat to the ability of plants to grow and develop or even lead to death	Genetically engineered plants that can tolerate global warming and climate change.	2019	Indonesia	http://cybex.pertanian.go.id/artikel/83088/ bagaimana-tanaman-menghadapi-kekeringan/
55	Ruslia Atmaja. Badan Penyuluhan dan Pengembangan SDM Pertanian, Kementerian Pertanian	Most drylands have low fertility rates and limited irrigation sources except from rainfall whose distribution cannot be controlled according to needs	Optimization of Dry Land for the Development of Food Crops	Implementing an intercropping system of jatropha plants with other annual food crops such as corn, peanuts, kedele, or gogo rice	2020	Indonesia	http://cybex.pertanian.go.id/artikel/92788/ optimalisasi-lahan-kering-untuk-pengembangan-tanaman-pangan/
56	Wakid Mutowal, Penyuluh Pertanian Kabupaten Grobogan, Jawa Tengah, Mahasiswa S2 Jurusan Pertanian Lahan Kering, King Abdul Aziz University, Jeddah, Kingdom of Saudi Arabia	Ketersediaan air untuk irigasi di daerah lahan kering sangat terbatas karena curah hujan yang rendah	Soil Amendment, Mulsa, Sistem Irigasi Tepat Guna.	Penghijauan, Springkler Irrigation, Drip Irrigation, Pemupukan Organik Terpadu, Penanaman tanaman pagar pemecah angin.	2013	Jawa Tengah	https://grobogan.go.id/info/artikel/562-kendala-pertanian-lahan-kering-dan-solusinya
57	Badan Penelitian dan Pengembangan Pertanian	A number of planting areas experienced drought impacts in the 2019 dry season	Program mitigasi kekeringan	Mobilisasi alat mesin pompa termasuk infrastruktur dan pipanisasi; penggunaan benih unggul yang adaptif di lahan kering; pendampingan Upsus (Upaya Khusus) yang diinisiasi para Babinsa	2019	Indonesia	https://www.pertanian.go.id/home/?show=news&act=view&id=3842
58	Badan Litbang Kementerian Pertanian	Irrigation of rainfed paddy fields is largely determined by rainfall so that the risk of drought often occurs in the area during the dry season. Rice varieties for rainfed paddy fields that have disease resistant properties are still very limited	Padi Tadah Hujan dan Berumur Genjah	The use of rainfed paddy rice varieties that are drought tolerant and resistant to blas disease, including Inpari 38 Rainfed, Inpari 39 Rainfed, and Inpari 41 Rainfed	NA	Indonesia	https://www.pertanian.go.id/home/?show=news&act=view&id=1935

APPENDIX C

Literature Analysis on Gender and CSA Practices in Indonesia

C Literature Analysis on Gender and CSA Practices in Indonesia

Stakeholders	Roles	CSA Pillars-Kinds of CSA	Commodities	Issues	Location
The Ministry of Agriculture	To support facilities (input) and support services (process) as agricultural innovation support system	Climate change adaptation	Arabica and Robusta coffee	Farmers adoption CSA rates remain low in coffee farmers	West Java and Bengkulu Province
	Creating new geographies of recognition, access, farmer learning, and agricultural production, and new flows of project funding and rents)	Climate change adaptation: Climate change service projects: Climate Field School (Farmer measuring rainfall)	Rice	Agro-ecological and harvest data in rice farmers is mostly discussed and strategies negotiated privately within households*	West Java (Indramayu Regency and Sumedang Regency) and West Nusa Tenggara (East Lombok Regency)
Indonesian Agency for Meteorology, Climatology, and Geophysics	Employed this farmer to train other farmers in rainfall measurements.	Climate change adaptation	Rice	Agro-ecological and harvest data in rice farmers is mostly discussed and strategies negotiated privately within households*	West Java (Indramayu Regency and Sumedang Regency) and West Nusa Tenggara (East Lombok Regency)
Indonesian Center for Rice Research (ICRR)	Develop CSA technologies	Food security and Climate change adaptation: The weather-rice-nutrient integrated decision support system (WeRise) as an information and communications technology (ICT)-tool to crop growth	Rainfed Rice	WeRise can improve rainfed rice productivity	West Nusa Tenggara (Central Lombok) Central Java (Rembang)
Provincial agricultural extension workers (PAEW), National Agricultural Research and Extension System Indonesian, and Directorate General of Agricultural Extension and Human Resource (DGAEHR)	Support WeRise be integrated with Katam in Technology Transfer Pathway (TTP)	Food security and Climate change adaptation: WeRise be integrated with Katam in Technology Transfer Pathway (TTP) The Cropping Calendar Information System Technology, locally known as Kalender Tanam or Katam, an ICT4D tool developed by the IAARD	Rainfed Rice	Farmers mostly rely on local wisdom and/or their own experiences for information on crop production and weather; need a technology which is easy to use.	West Nusa Tenggara (Central Lombok) Central Java (Rembang); Serdang Village located in Serdang District in Deli Serdang, North Sumatera
	Develop a curriculum of agricultural extension services and technical guidance (Bimtek) programmes based on gender issues	Climate change adaptation: Curriculum of agricultural extension services/training and technical guidance (Bimtek) programmes with the goal of dismantling the barriers that restrict and undervalue women's participation in agricultural production systems	Maize	Women currently lack equal access to educational opportunities, financial capital, and influence in household and farmer group decision-making processes in NTT's maize production system.	East Java, North Sumatra, and East Nusa Tenggara Timur
Agency for Agricultural Research and Development (IAARD)	Support WeRise be integrated with Katam in Technology Transfer Pathway (TTP) The Cropping Calendar Information System Technology, locally known as Kalender Tanam or Katam	Climate change adaptation	Rainfed Rice	WeRise can improve rainfed rice productivity	East Java, North Sumatra, and East Nusa Tenggara Timur
Directorate General of Food Crops (DGFC)	To assure the CSA innovation	Food security and Climate change adaptation	Rainfed Rice	WeRise can improve rainfed rice productivity	East Java, North Sumatra, and East Nusa Tenggara Timur
Ministry of Forestry and Environment; provincial consultations with representatives from governments,	Reduce GHG emissions from peatlands by develop a set of governance indicators collaboratively	Food security, Climate change adaptation, and Reducing emissions: Agriculture, forestry and cultivation	Forestry, such as for palm oil and other plantations	Technical and socio-economic constraints that can prevent drained peatlands from being rewetted.	Peatlands in Mentangai, Kapuas, Central Kalimantan

Stakeholders	Roles	CSA Pillars-Kinds of CSA	Commodities	Issues	Location
NGOs, academia and forest business associations		under wet conditions, a practice known as paludiculture			
NA	To provide a good post-harvest handling and storage practices	Reducing emissions: Low cost fish solar dryer	Fisheries	Solar driers can increase drying rates and produce lower moisture content in the inal products, which results in improvements in fish quality and reduction in losses compared to traditional sun drying techniques	NA
Central Statistics Agency	Provide secondary data	Climate change adaptation	Arabica and Robusta coffee	Support adoption of CSA	West Java and Bengkulu Province
?	Provide secondary data	Food security and Climate change adaptation: conversion maize to livestock feed	Maize	Lack of gender disaggregated data in the agricultural sector. Women lack to educational opportunities, financial capital, and influence in household and farmer group decision-making The resources and capacity to implement gender-based practices at the local level is often lacking.	East Java, North Sumatra, and East Nusa Tenggara Timur
Local governments	Should put effort and invest in developing and improving the extension role in agriculture development.	Climate change adaptation	Arabica and Robusta coffee	Climate and weather forecasting has become crucial for cultivation decision-making due to the increasing climate variability	NA
The regional government	Initiates coffee development in Bandung Regency to improve the upstream area of the Citarum Watershed	Food security	The Integrated Crop Livestock Systems (ICLS)	Women in cultivation activities (fertilizing and harvesting) were never involved than in pest disease management and post-harvest activities. In livestock business activities, women are relatively limited to being involved in livestock management; than utilizing cattle wase for organic fertilizer and animal feed management.	Bandung Regency, West Java
Local cooperative	As farmers organization in CSA practices	Reducing emissions: manure management focus on the distribution of digesters for biogas	Biogas	The members of the local cooperative pay as much as 1 litre of milk per day for one year until the whole amount is fully paid	Pangalengan District of West Java; and Lumajang District, East Java
Ministry of Energy and Mineral Resources	To develop the CSA technologies	Reducing emissions: energy supplies Possible photovoltaic (PV) system	Energy supplies	A conceptual design and preliminary configuration of a Co-Located Photovoltaic Agriculture system has been proposed, including the probable investment and rate of return.	Bangli, Bali
NA	To provide nutritious food products	Reducing emissions: Reusing waste for human consumption and animal feed	Fermenting peanut and coconut	Various waste products are fermented into nutritious food products, namely *traditional tempeh, ontjom*	West Java

APPENDIX D

Presentation Deck (Online Discussion, 13 March 2023)

Identification of Technical Practices for Climate-Smart Agriculture (CSA) in Indonesia

Finalisation of Output 1
13 March 2023

CTCN
UN Climate Technology Centre & Network
UNFCCC Technology Mechanism

UN environment programme | DHI
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DHI

1

Agenda

- Stakeholders mapping for working group members
  - Proposed working group members
- Proposed geographical area in Indonesia to contextual technology analysis

DHI

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Main Outputs

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TA Objectives

- To identify and design suitable CSA technologies and associated systems for enhancing climate change adaptation in the agriculture sector in Indonesia

- *Findings from the TA will facilitate the implementation and replication of CSA technologies in Indonesia, supporting the achievement of the goals and strategies of Indonesia's National Action Plan for Climate Change Adaptation (RAN-API)*

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Main Outcome

- Focuses on two (2) indicative technical interventions in the agriculture sector included in Indonesia's National Action Plan for Climate Change Adaptation (RAN-API):
  - The use of sensors that can identify water content and soil chemistry on agricultural land
  - Automation of watering and fertilising tools according to land requirements

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Implementation Plan

- TA duration:
  - 12 months
- Contract timeline:
  - 24 October 2022 to 24 October 2023
- TA implementation timeline:
  - 13 January 2023 to 31 January 2024

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Mandatory Outputs (Administrative)

- Detailed implementation plan
- Monitoring and evaluation plan
- Initial impact statement
- Final impact statement
- TA closure report

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Overall Outputs (Technical)

- Output 1: *Map stakeholders and organize an inception meeting*
- Output 2: *Identify technologies to support the identification of water content and soil chemistry on agricultural land*
- Output 3: *Identify technologies for automatic irrigation and fertilizer application and design an integrated system for the suitable conditions as per the geographic location selected*
- Output 4: *Analyse market potential and cost-benefit of the fully integrated system*
- Output 5: *Train governmental bodies in CSA practices and the fully integrated system*

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Output 1: *Map stakeholders and organize an inception meeting*

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Activities for Output 1

- **Activity 1.1:** Map stakeholders that are likely to be involved in CSA deployment in Indonesia
  - *D1.1.1: Stakeholder analysis report*
- **Activity 1.2:** Establish a stakeholder working group
  - *D1.2.1: List of confirmed working group members*
- **Activity 1.3:** Organize an inception meeting for the stakeholder working group
  - *D1.3.1: Inception meeting*
  - *D1.3.2: Minutes of the inception meeting*

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Activity 1.1: Map stakeholders that are likely to be involved in CSA deployment in Indonesia

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Activity 1.1: Map stakeholders

- Mapping of the main stakeholders who would be involved in CSA practices in Indonesia
- Desktop assessment to select a geographical location in Indonesia to contextualise the CSA technology

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Activity 1.1: Map stakeholders (cont'd)

- A comprehensive literature review was carried out to guide the stakeholder mapping, which was focused on the following themes:
  - Identify the implementation of CSA in Indonesia by applying the 5W1H (What, Who, Where, When, Why and How) approach
  - Gender analysis on CSA at the national level (for relevant technologies in the Indonesian context)
  - National policies and programmes related to CSA
- Shortlisting of stakeholders via brainstorming sessions

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Stakeholder Analysis

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Main Findings – Themes

- CSA practice in Indonesia
- Gender and CSA
- CSA stakeholders in Indonesia

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Theme 1:

CSA Practice in Indonesia

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CSA Practice in Indonesia

- CSA – an integrated approach managing landscapes to help adapt agricultural methods, livestock and crops to the effects of climate change, and where possible, counteract it by reducing GHD emissions from agriculture ensuring food security
- Three (3) pillars of CSA (Labios *et al., 2022*):
  - Sustainably increasing agricultural productivity and incomes *(productivity)*
  - Adapting and building resilience to climate change *(resilience)*
  - Reducing GHG emissions from agricultural production and processing *(emission)*

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CSA Practice in Indonesia (cont'd)

- Data related to the analysis of literature generally found that literature on CSA practices in Indonesia:
  - Not implemented yet
  - Implemented with a gender approach
  - Implemented without a gender approach
- Many CSA programmes in Indonesia (e.g., in West Java, East and West Nusa Tenggara, Bali, North Sumatera and Bengkulu) focused on two (2) CSA pillars:
  - Productivity
  - Resilience to climate change

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CSA Practice in Indonesia (cont'd)

- Agricultural commodities applying CSA technologies in Indonesia:
  - Coffee
  - Rice
  - Maize (corn)
- Among the CSA technologies include:
  - Weather-rice-nutrient integrated decision supposed system (WeRise) integrated with the Technology Transfer Pathway (TTP)
  - Curriculum of agricultural extension services/training
  - Climate field school
  - Conversion of maize to livestock feed
  - Reusing waste
  - Co-located Photovoltaic Agriculture system

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Theme 2:

Gender and CSA

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Gender and CSA

- Women and stakeholders are vulnerable as they have less access to agricultural assets, information, technology, mobility and low decision-making power (Wulanduri & Djufry, 2021)
- To minimise the gap between men and women as primary stakeholders in agriculture, gender-responsive in CSA implementation should be determined in three phases: planning, implementation, and impact evaluation.
  - Implementation needs to be framed in the sense that gender relations exist in CSA programme implementation and household units where it is influenced by their culture in society.

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Gender and CSA (cont'd)

- The gender-mainstreaming policies provided by the Ministry of Woman Empowerment and Child Protection (KPPA) are needed to ensure women's involvement and benefit in CSA implementation
- Gender mainstreaming is based on Presidential Instruction No. 9 of 2000 in National Development
  - The Government of Indonesia is committed to women's empowerment and has worked to mainstream gender considerations into policy and planning processes, such as affirmative action, to maintain gender equality and women's empowerment
- Women's involvement is governed by Indonesian Law Number 12 of 2003, related to the requirement of the representation of at least 30% of women participation in Public Elections becomes the operational practice to deliver the development program in Indonesia

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Theme 3:

CSA Stakeholders in Indonesia

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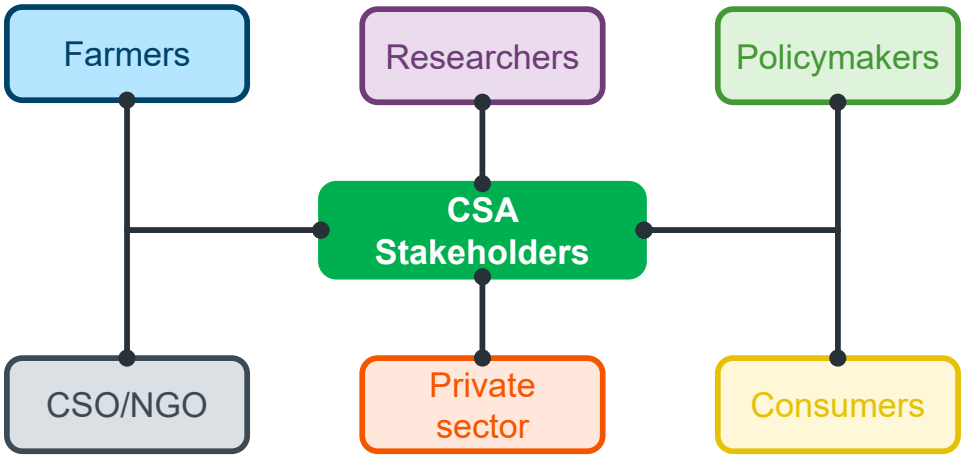
CSA Stakeholder Categories in Indonesia



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Farmers

- Directly impacted by climate change (droughts, floods and changes in temperature and precipitation patterns)
- Responsible for implementing the practices to make their farms more sustainable and climate-resilient

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Researchers

- Developing and testing new technologies and practices
- Play a role in monitoring and evaluating the impacts of CSA interventions to ensure effectiveness and efficiency

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Policymakers

- Provide necessary national regulatory and policy framework, and financial support to scale up CSA interventions
- Play a role in shaping international policies and agreements that promote sustainable agriculture and reduce GHG emissions
  - *Directorate General of Agricultural Extension and Human Resource, Ministry of Agriculture*

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CSO / NGO / Private Sector

- Can provide funding, technical expertise and other forms of support to farmers and other actors in the food system
- Play a role in driving demand for sustainable and climate-friendly agriculture products, and in promoting greater transparency and accountability across the food system

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Consumers

- Play a role in driving demand for sustainable and climate-friendly agricultural products

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Stakeholders List

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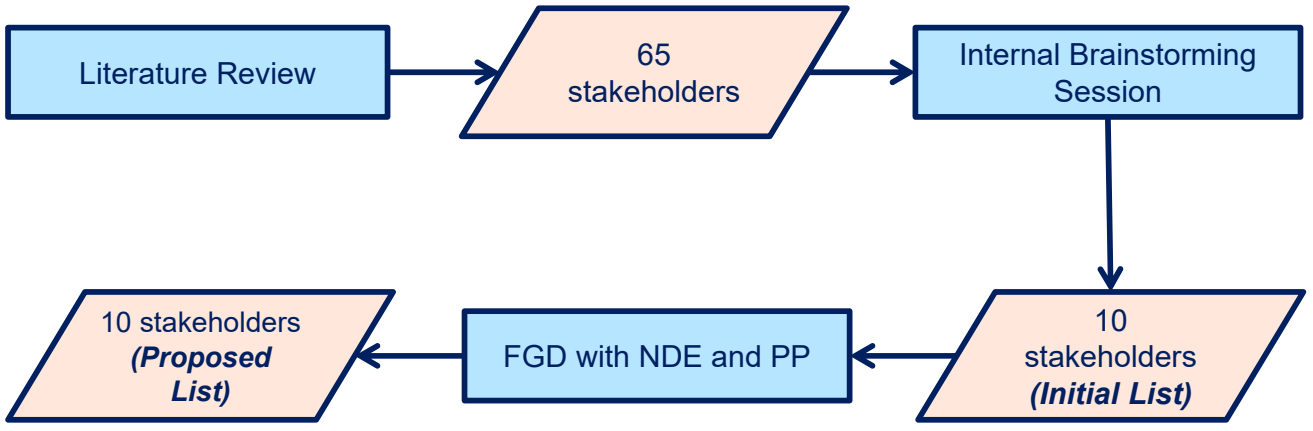
Stakeholders List



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31

Initial Stakeholders List

Stakeholder	Institution	Role
Directorate of Research, Technology and Innovation Policy Evaluation	BRIN	Project proponent
Directorate General of Climate Change (DJPPI)	Ministry of Environment and Forestry (KLHK)	National Designated Entity (NDE)
Directorate for Poverty Reduction	Ministry of Women Empowerment and Children Protection (KPPA)	Community involvement (gender-sensitive)
Balai Teknik Irigasi	Ministry of Public Works and Housing (KPUPR)	Irrigation, efficiency of water use in CSA practice
Deputy for Food and Agribusiness Coordination	Coordinating Ministry for Economic Affairs (KemenKoE)	Monitoring, analysing, evaluating and reporting in the field of food and agribusiness

32

Initial Stakeholders List (cont'd)

Stakeholder	Institution	Role
Directorate General of Agricultural Extension and Human Resources	Ministry of Agriculture (Kementan)	Facilitate smallholder
Directorate General of Agricultural Infrastructure	Kementan	Farmers support to adopt CSA practices
Directorate General of Food Crops	Kementan	Programme support and input for smallholders regarding CSA's pillars
Limnology and Water Resources Research Group	BRIN	R&D activities – develop CSA practices
Agricultural and Food Research Organisation, Good Crop Research	BRIN	R&D activities – develop CSA practices

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Proposed Stakeholders List

Stakeholder	Institution	Role
Directorate General of Climate Change (DJPPI)	Ministry of Environment and Forestry (KLHK)	NDE
Directorate of Research, Technology and Innovation Policy Evaluation	BRIN	Project proponent
Centre for Sustainable Production Systems and Life Cycle Assessment	BRIN	Programme sustainability
Horticulture and Plantation Research Centre	BRIN	R&D
Local Government	*To be determined*	Local administrator

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Proposed Stakeholders List (cont'd)

Stakeholder	Institution	Role
Directorate General of Agricultural Extension and Human Resources	Ministry of Agriculture (Kementan)	Farmers relation
Directorate for Poverty Reduction	Ministry of Women Empowerment and Children Protection (KPPA)	Community involvement (gender-sensitive)
NGO or Private Sector	*To be determined*	Practitioner
Directorate General of Food Crops	Kementan	Programme support and input for smallholders regarding CSA's pillars
Balai Teknik Irigasi	Ministry of Public Works and Housing (KPUPR)	Irrigation, efficiency of water use in CSA practice

35

DISCUSSION – 20 minutes

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Geographical Location

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Selection Criteria

- Desktop assessment and ranking using several criteria:
  - Type of water resource
  - Type of commodity
  - Access
  - Agri-climate
  - *Indeks Desa Membangun (IDM)* (2022)
  - Gender Empowerment Index (2021)
  - Topography
  - *Proklim (Program Kampung Iklim)*

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Preliminary Proposed Locations

1. East Lombok Regency in West Nusa Tenggara Province
2. Sumbawa Regency in West Nusa Tenggara Province
3. Jember Regency in East Java Province
4. Gunung Kidul Regency in DI Yogyakarta Province
5. Wonogiri Regency in Central Java Province
6. Boyolali Regency in Central Java Province
7. Sukabumi Regency in West Java Province
8. South Lampung Regency in Lampung Province
9. Pariaman Regency in West Sumatra Province
10. Majene Regency in West Sulawesi Province
11. Karang Asem Regency in Bali Province
12. Buleleng Regency in Bali Province

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Final Proposed Locations (Top 3)

- East Lombok Regency in West Nusa Tenggara Province
- Buleleng Regency in Bali Province
- Sukabumi Regency in West Java Province

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East Lombok Regency in West Nusa Tenggara Province

- Water source: surface water
- Access score: 30
- Commodity: corn
- Climate: E4, D4
- IDM (2022): Maju (0.7845)
- GEI (2021): 65.99
- Topography: Ramps-steep
- Proklim: Yes

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Buleleng Regency in Bali Province

- Water source: surface water, limited, sedimentation
- Access score: 40
- Commodity: carrots, chillies, bananas
- Climate: D4
- IDM (2022): Maju (0.7504)
- GEI (2021): 72.91
- Topography: Ramps
- Proklim: Yes

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Sukabumi Regency in West Java Province

- Water source: surface water
- Access score: 30
- Commodity: crops
- Climate: B2
- IDM (2022): Maju (0.7327)
- GEI (2021): 71.61
- Topography: Ramps-hilly
- Proklim: Yes

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DISCUSSION – 20 minutes

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Thank you

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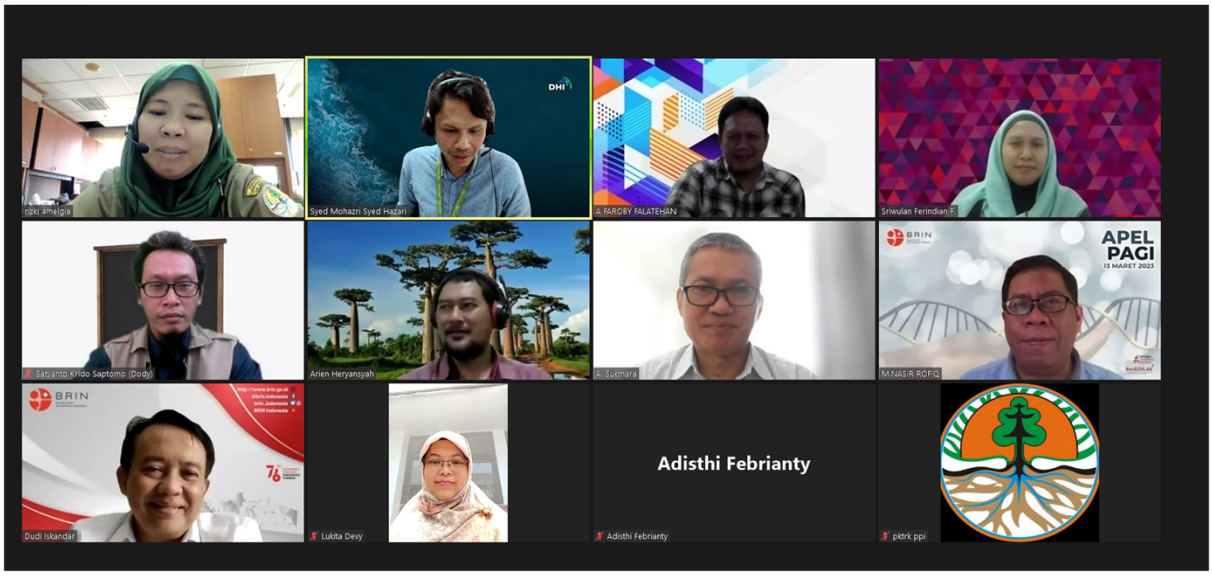

Screenshot of participants – Online Discussion on 13 March 2023

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48