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Article Title

Implementation of the Diverse, Nutritionally Balanced, and Safe Food Program in Mahakam Ulu: The Gap between Administrative Readiness and Supporting Conditions

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ABSTRACT

The Diverse, Nutritionally Balanced, and Safe Food (DNBSF) Program is intended to strengthen food consumption diversification through education, local food promotion, home-garden utilization, and cross-sectoral support. This study aims to analyze administrative readiness, supporting conditions associated with service reach, and the relationships among components that generate implementation gaps in the DNBSF Program in Mahakam Ulu Regency. The study used a descriptive-analytical qualitative approach involving seven implementing officials at the provincial and regency levels as informants. Data were collected through semi-structured interviews and document review. Data analysis included condensation, coding, thematic grouping, cross-informant comparison, cross-checking against documentary evidence, and cross-theme synthesis. The findings show that procedural capacity is supported by a policy basis, planning, role allocation, resource organization, communication, reporting, and control. Service reach is influenced by budget adequacy, activity coverage, implementing personnel, territorial access, food distribution, technology use, and local food utilization. Activity outputs can be traced through promotion, outreach, home-garden support, supervision, and reporting. Outcome evidence requires information on recipients, interventions, the use of support, follow-up, and intermediate outcomes. Analysis across the three levels identifies a service reach gap and an outcome evidence gap as two forms of implementation gap in the DNBSF Program in Mahakam Ulu.

Keywords: *DNBSF Program; Policy Implementation; Procedural Capacity; Service Reach; Outcome Evidence.*

INTRODUCTION

Food security concerns the ability of communities to obtain and utilize diverse, nutritionally balanced, and safe foods. Its fulfillment requires adequate food availability as well as conditions that influence food utilization. Consumption choices are associated with the food environment and individual and household characteristics. The food environment includes availability, price, accessibility, affordability, convenience, promotion, and product characteristics. Consumption decisions are also influenced by individual preferences and circumstances (Turner et al., 2018; Downs et al., 2020). Food consumption diversification therefore needs to be analyzed in relation to external conditions and individual responses. Analytical accuracy also requires alignment among concepts, indicators, exposure, and the types of outcomes observed (Turner et al., 2020).

Food consumption diversification forms part of food security governance under Law Number 18 of 2012. The regulatory framework includes the utilization of local food resources to improve diet quality. The Desirable Dietary Pattern (DDP) provides a measure of diet quality based on the quantity and composition of food groups and supports planning based on population consumption data (Anggraini, 2026). Household consumption patterns vary according to environmental conditions, resources, preferences, income, production, infrastructure, distribution, price stability, and promotion (Ariani et al., 2018). Food diversification therefore encompasses policy, food resources, access, food preparation capacity, and public acceptance of available food choices.

The Diverse, Nutritionally Balanced, and Safe Food (DNBSF) Program implements food diversification policy through education, local food promotion, home-garden utilization, and processed-food development. In East Kalimantan, local food festivals are used for education, promotion, and collaboration. Their implementation takes place under varying economic, sociocultural, and infrastructural conditions (Amelia et al., 2024). Regional government agencies provide information on food availability and affordability, nutrition education, and efforts to increase awareness of dietary choices (Hariyanti, 2025). At the household level, local food utilization is associated with family characteristics, knowledge, income, and preferences (Heryadi et al., 2024). The development of alternative carbohydrate sources is also constrained by the limited availability of affordable and readily accessible substitute products and by strong preferences for rice (Rozi et al., 2023). Implementation of the DNBSF Program is therefore influenced by government interventions and by conditions affecting access and consumption decisions.

Mahakam Ulu Regency provides the empirical setting for this analysis. Regional consumption data indicate a need to strengthen diversification, while territorial conditions influence food distribution and service delivery (DKPP, 2025). The regency comprises five districts and 50 villages with different levels of access across areas (BPS-Statistics Mahakam Ulu, 2025). Access also varies by season. Lower water levels in the Mahakam River affect river transportation. The regency government uses transport cost subsidies as one response to distribution conditions, while rainy-season road conditions are associated with longer travel times to upstream areas (Pivitha, 2025; Salim, 2025). These conditions constitute part of the operational environment that affects organizational capacity to provide activities and services to target groups.

From an organizational perspective, program implementation requires administrative readiness to operationalize policy objectives. Implementation requires clear objectives, division of responsibilities, resources, communication, coordination, management of interorganizational dependence, and external conditions that support continuity of action (Hogwood & Gunn, 1985). The involvement of multiple organizations requires coordination because coordination, coherence, and integration perform distinct functions in policy implementation (Cejudo & Michel, 2017). Coordination also depends on an organization's capacity to use information from partner organizations and work collaboratively (Peters, 2018). Internal capacity, institutional collaboration, and resource allocation determine the ability of local governments to implement policy (Apriani & Hariati, 2025). Analysis of administrative readiness therefore needs to include the ability of organizations to use available capacity to provide services to target groups.

Previous studies have examined several components relevant to these issues. Research on food diversification has addressed DDP, consumption patterns, local foods, household preferences, and alternative carbohydrate sources (Ariani et al.,

2018; Rahmanto et al., 2021; Mayasari, 2023; Rozi et al., 2023; Heryadi et al., 2024). Studies of the DNBSF Program have examined promotion, local food festivals, program management, education, household consumption, and access to assistance (Amelia et al., 2024; Suhaila et al., 2024; Febriani et al., 2025; Hariyanti, 2025; Rahimah et al., 2025). Implementation studies have addressed communication, organizational structure, resources, coordination, and institutional capacity at different levels of attainment (Cejudo & Michel, 2017; Peters, 2018; Alwi & Susanti, 2023; Indarto et al., 2024; Said et al., 2024; Asril et al., 2026). These studies have generally examined administrative readiness, service delivery, or outcomes separately. Further analysis is therefore required to integrate administrative readiness, service reach, and outcome evidence within DNBSF implementation in a geographically constrained area.

This gap is analyzed through three levels of implementation: procedural capacity, service reach, and outcome evidence. Procedural capacity encompasses the existence and organization of the policy basis, operationalization of objectives into activities, role allocation, planning, resources, communication, reporting, and control. Service reach concerns the adequacy of implementation capacity through operational resources, implementing personnel, activity coverage, territorial access, adaptation to local conditions, technology, and local food utilization. Outcome evidence concerns the availability of information on recipients, forms of intervention, message reception or the use of support, follow-up, and intermediate outcomes after intervention. Analysis of the relationships among these three levels identifies a service reach gap between procedural capacity and service reach, as well as an outcome evidence gap between activity outputs and intermediate outcomes among target groups.

Based on this framework, the study aims to analyze the administrative readiness of the DNBSF Program in Mahakam Ulu Regency as procedural capacity. The analysis further examines the adequacy of supporting conditions associated with service reach through access and distribution, activity coverage, operational resources, field assistance, adaptation to local conditions, technology, and local food utilization. The study also analyzes relationships among components that indicate a service reach gap and an outcome evidence gap. Academically, the analysis integrates organizational capacity, service reach, and outcome evidence within food policy implementation. Practically, the findings provide a basis for strengthening DNBSF management in areas characterized by complex institutional, territorial, and service-delivery conditions.

METHOD

This study used a descriptive-analytical qualitative approach to examine the implementation of the DNBSF Program in Mahakam Ulu Regency (Creswell & Poth, 2018). The unit of analysis covered relationships among administrative readiness, supporting conditions, service reach, activity outputs, and outcome evidence. The study was conducted at the East Kalimantan Provincial Food, Food Crops, and Horticulture

Office and the Mahakam Ulu Regency Food Security and Agriculture Office from March 5 to June 22, 2026. The two regional government agencies represent the provincial guidance function and regency-level implementation function, respectively. The analytical context included territorial characteristics, food access and distribution, consumption patterns, local food utilization, activity coverage, resource use, and interorganizational relationships.

Informants were selected purposively based on their involvement, authority, and knowledge of DNBSF planning, coordination, implementation, and supervision (Spradley, 2016). Seven implementing officials participated as informants, comprising six officials from the East Kalimantan Provincial Food, Food Crops, and Horticulture Office and one official from the Mahakam Ulu Regency Food Security and Agriculture Office. This composition was used to analyze provincial guidance and support functions and regency-level implementation. Semi-structured interviews collected information on the operationalization of objectives into activities, planning, role allocation, resources, communication, coordination, control, territorial conditions, food distribution, technology use, local food utilization, service coverage, forms of activity, and relationships between interventions and target groups.

Secondary data were obtained through document review of regulations, circular letters, regional government planning documents, internal control materials, activity reports, consumption and DDP data, regional statistical publications, and official government publications concerning access, distribution, infrastructure, food logistics, and activities associated with the DNBSF Program. Academic literature provided the conceptual foundation and references for the discussion. Documentary data were used to analyze implementers' accounts in relation to the policy basis, planning, activity records, consumption conditions, and territorial characteristics.

The analysis involved data condensation, coding, thematic grouping, cross-informant comparison, cross-checking interviews against documentary evidence, analysis of relationships among themes, and analytical conclusion drawing (Miles et al., 2014; Braun & Clarke, 2021). Data condensation involved selecting and grouping information relevant to the components of DNBSF implementation. Coding and thematic grouping organized the data according to similarities in function and relationships among components. Cross-informant comparison was used to analyze the relationship between information at the provincial and regency levels. Documentary cross-checking linked implementers' accounts with policies, planning, activity records, consumption data, and territorial conditions.

The findings were organized into three analytical levels. Procedural capacity covered the existence and organization of the policy basis, operationalization of objectives into activities, role allocation, planning, resources, communication, reporting, and control. Service reach covered the adequacy and use of operational resources, implementing personnel, activity coverage, access and distribution,

adaptation to territorial conditions, technology, and local food utilization. Outcome evidence covered the availability of information on activity outputs, recipients, forms of intervention, information delivery, use of support, follow-up, and intermediate outcomes. Comparison across these three levels was used to identify the service reach gap and the outcome evidence gap. The results were subsequently discussed using policy implementation theory and compared with previous studies.

RESULTS AND DISCUSSION

A. Procedural Capacity in the Administrative Readiness of the DNBSF Program

Administrative readiness for DNBSF implementation in Mahakam Ulu encompasses the policy basis, operationalization of objectives into activities, role allocation, planning, resource organization, communication, reporting, and control at the provincial and regency levels. The normative basis for food consumption diversification is established in Law Number 18 of 2012. Regional promotion is also supported by East Kalimantan Governor Circular Letter Number 524/9222/EK of 2022. The Head of the East Kalimantan Provincial Food, Food Crops, and Horticulture Office explained that:

“Education, outreach, promotion, regulatory development, and agency activities were used to improve public understanding of DNBSF consumption patterns.” (Interview, April 22, 2026).

The relationship among objectives, sequences of action, resources, communication, coordination, and control demonstrates the function of procedural capacity in sustaining implementation (Hogwood & Gunn, 1985). Education and promotion are also used to communicate food diversification policy to the public (Amelia et al., 2024; Hariyanti, 2025). These components demonstrate the availability of an organizational basis and mechanisms for policy implementation.

Planning establishes the relationship among program objectives, activities, timing, locations, and target-group needs. The 2024 Work Plan of the East Kalimantan Provincial Food, Food Crops, and Horticulture Office includes food-related activities within regional government planning. Activities are prepared before the implementation year by involving regencies and cities and considering territorial conditions. An Associate Policy Analyst at the East Kalimantan Provincial Food, Food Crops, and Horticulture Office explained that:

“Activity planning was prepared one year before implementation and involved regencies and cities as implementation locations. Priority locations were also selected by considering local conditions, including areas with stunting cases.” (Interview, March 5, 2026).

This practice is consistent with Rahimah et al. (2025), who identify relationships among planning, organizing, implementation, communication,

and control in DNBSF management. Indarto (2020) similarly identifies policy, implementers, targets, environment, and process as components of DDP policy implementation.

Role allocation operates vertically and horizontally. The East Kalimantan Provincial Food, Food Crops, and Horticulture Office performs planning, guidance, coordination, promotion, and control functions. The Mahakam Ulu Regency Food Security and Agriculture Office performs implementation functions at the regency level. Implementation also receives support from cross-sectoral government agencies, academics, the Family Welfare Empowerment organization, data providers, and other government entities. These relationships encompass system, organizational, and implementer levels, as described by Hill and Hupe (2002). Information exchange and the use of resources across organizations are also important components of food policy implementation (Alwi & Susanti, 2023). The Secretary of the East Kalimantan Provincial Food, Food Crops, and Horticulture Office explained that:

“DNBSF implementation requires support across organizational units. The secretariat supports publication and promotion, the Food Availability and Distribution Division contributes to food-waste control, and the Agriculture Division supports the development of local food commodities.” (Interview, June 19, 2026).

Table 1. Supporting Actors and Forms of Support in DNBSF Program Implementation

Institution	Form of Support
Mahakam Ulu Regency Food Security and Agriculture Office	Program implementation
East Kalimantan Provincial Food, Food Crops, and Horticulture Office	Guidance, outreach, and monitoring
Universities/academics	Academic studies, policy brief discussions, food diversification recommendations, and local food education
Education Office	School outreach targets
Health Office	Community nutrition volunteers and stunting response
Fisheries Office	Support for protein sources
Livestock Office	Support for animal-protein sources
Family Welfare Empowerment organization	Family and household education
Statistics Indonesia	Consumption and DDP data
Mahakam Ulu Regency Economic and Natural Resources Section	Food transport cost subsidies

Source: Research data, processed by the authors, 2026.

Role allocation contributes to implementation when it is accompanied by information exchange, resource use, and alignment of actions. Cejudo and Michel (2017) distinguish coordination, coherence, and integration as interrelated

processes with different functions. Peters (2018) identifies the use of partner information and willingness to work together as important components of coordination. Implementation involving more organizations, decisions, and stages requires more complex coordination (Pressman & Wildavsky, 1984). Collaboration supports the utilization of internal capacity and organizational resources (Apriani & Hariati, 2025). Institutional fragmentation is associated with a mismatch between resource potential and institutional readiness (Asril et al., 2026). An Associate Agricultural Product Quality Supervisor at the East Kalimantan Provincial Food, Food Crops, and Horticulture Office explained that:

“Coordination with one or two agencies could be conducted more directly. Involving more agencies divides implementers’ time and attention, thereby requiring stronger coordination arrangements to maintain effective communication of program objectives.” (Interview, June 19, 2026).

Administrative resources include budgets, personnel, information, technology, and organizational networks. Under budget-efficiency measures, the use of technology formed part of the adjustments to program implementation. The Secretary of the East Kalimantan Provincial Food, Food Crops, and Horticulture Office explained that:

“Program implementation was adjusted through the use of technology, such as online meetings, outreach through the office website, and the office’s social media.” (Interview, June 19, 2026).

Administrative supervision was also conducted through technical and documentary requirements. A Junior Food Security Analyst at the East Kalimantan Provincial Food, Food Crops, and Horticulture Office explained that:

“Supervision was conducted through technical implementation guidelines and documentary requirements that assistance recipients and program implementers were required to fulfill.” (Interview, June 22, 2026).

These conditions are consistent with findings that bureaucratic structure and human resource adequacy may reach different levels of attainment (Indarto et al., 2024). Said et al. (2024) similarly identify different levels of attainment in communication, implementation structure, and resources. Procedural capacity is therefore supported through policy, planning, role allocation, resource organization, communication, reporting, and control. The adequacy of subsequent service delivery depends on operational resources and territorial conditions.

B. Supporting Conditions and the Adequacy of DNBSF Service Reach

Supporting conditions determine the capacity of procedural arrangements to sustain service delivery. The regional consumption profile provides substantive context for assessing diversification needs. The DDP score for Mahakam Ulu Regency was 77.80 in 2021, 78.00 in 2022, 83.60 in 2023, 80.80 in 2024, and 72.53 in 2025 (DKPP, 2025). DDP measures diet quality based on the quantity and

composition of food groups using data from the National Socioeconomic Survey (Anggraini, 2026). In 2025, the National Socioeconomic Survey was conducted in February to reduce consumption bias during Ramadan, while the number of commodities covered in the questionnaire increased from 197 to 225 (Bapanas, 2025). The series provides an aggregate picture of changes in dietary diversity and the need to strengthen diversification at the regional level (Mayasari, 2023). Assessment of DNBSF outcomes at the recipient level requires data directly associated with program recipients and interventions.

Table 2. Development of the Desirable Dietary Pattern Score in Mahakam Ulu Regency, 2021–2025

Year	DDP Score
2021	77.80
2022	78.00
2023	83.60
2024	80.80
2025	72.53

Source: DKPP (2025), reprocessed by the authors, 2026.

The 2025 consumption composition shows total consumption of 713.44 grams per capita per day, energy intake of 1,828.86 kcal, and protein intake of 51.11 grams. Cereals accounted for 985.69 kcal of energy and 22.77 grams of protein. These values represented 53.90 percent of energy and 44.55 percent of protein, with a DDP score of 23.47 against an ideal score of 25.00. The score for vegetables and fruits was 16.39 out of 30.00, legumes 2.85 out of 10.00, and tubers 0.72 out of 2.50 (DKPP, 2025). This composition indicates the need for greater diversification across several food groups. At the national level, the development of alternative carbohydrate sources is also constrained by the limited availability of affordable and readily accessible substitute products (Rozi et al., 2023). An Associate Policy Analyst at the East Kalimantan Provincial Food, Food Crops, and Horticulture Office explained that:

“Consumption patterns are associated with habits, family preferences, cultural background, and ease of access to particular foods. Local food availability therefore needs to be supported by knowledge, access, and public acceptance to influence consumption (Interview, March 5, 2026).”

The Head of the East Kalimantan Provincial Food, Food Crops, and Horticulture Office further explained that:

“Most people still rely on rice as their main source of carbohydrates, while the use of local foods such as corn, tubers, sago, and taro remains limited. In addition to habitual factors, the preparation of local foods is not yet widely understood by the public, while rice is relatively easier to obtain” (Interview, April 22, 2026).”

Table 3. Energy and Protein Consumption and Desirable Dietary Pattern Scores by Food Group in Mahakam Ulu Regency, 2025

Food Grup	g/Capita/Day	Energy (kcal)	Protein (g)	DDP Score	Ideal Score
Cereals	256.52	985.69	22.77	23.47	25.00
Tubers	25.74	30.41	0.29	0.72	2.50
Animal-source foods	138.67	226.63	20.21	21.58	24.00
Oils and fats	32.57	293.76	0.00	5.00	5.00
Oily fruits or seeds	0.12	0.77	0.02	0.02	1.00
Legumes	10.78	29.90	2.48	2.85	10.00
Sugar	41.00	143.66	0.29	2.50	2.50
Vegetables and fruits	144.78	68.82	3.02	16.39	30.00
Others	53.26	49.22	2.02	0.00	0.00
Total	713.44	1828.86	51.11	72.53	100.00

Source: *DKPP (2025)*, reprocessed by the authors, 2026.

Territorial conditions form part of the operational environment of service delivery. Mahakam Ulu consists of five districts and 50 villages. Long Apari is located 109.75 kilometers from the regency capital, while 65.63 percent of the road network was classified as severely damaged in 2024 ([BPS-Statistics Mahakam Ulu, 2025](#)). Lower water levels in the Mahakam River affect river access. Rainy-season conditions are also associated with longer travel times to upstream areas ([Pivitha, 2025](#); [Salim, 2025](#)). Strengthening BULOG warehousing facilities forms part of the government response to the regency's dependence on some external food supplies and its transportation constraints ([Adm, 2026](#)). These geographical, transportation, and distribution conditions constitute an external environment that affects DNBSF service delivery. Food environment studies identify accessibility, price, convenience, and environmental characteristics as determinants of food acquisition ([Turner et al., 2018](#); [Downs et al., 2020](#)). A Junior Food Security Analyst at the Mahakam Ulu Regency Food Security and Agriculture Office explained that:

“Lower water levels in the Mahakam River during the dry season reduce supplies of fresh food from West Kutai. The regency government uses a Transport Cost Subsidy (TCS) for transportation to Long Bagun, while distribution to more distant areas such as Long Apari uses overland routes. Communities also use locally available vegetables and fruits as part of their food supply.” (Interview, June 17, 2026).

This information demonstrates distribution adjustments to geographical conditions and changes in access. DNBSF service reach is directly associated with the adequacy of program resources, activity selection, and geographical coverage. Under budget constraints, implementation was concentrated on several priority activities, while outreach covered only some villages. In the framework developed by [Hogwood and Gunn \(1985\)](#), continuity of implementation depends on adequate

time and resources from planning through service delivery to target groups. Indarto (2020) identifies the appropriateness of implementers, target groups, environment, and processes as components of DDP policy implementation. Febriani et al. (2025) show that access to DNBSF assistance and household consumption conditions constitute two different dimensions. A Junior Food Security Analyst at the Mahakam Ulu Regency Food Security and Agriculture Office explained that:

“Budget-efficiency measures were addressed by seeking planning support from the Regional Development Planning Agency. Budget constraints resulted in current-year activities being concentrated on a DNBSF competition, vegetable-seed assistance for home gardens, and DNBSF outreach in several villages.” (Interview, June 17, 2026).

Technology supports adjustments in communication and coordination through online meetings, websites, and social media. Assistance distribution, home-garden monitoring, and field assistance continue to require implementing personnel and direct field activities. Technology therefore expands the available means of communication and coordination, while direct service activities remain dependent on field resources. Adaptation of actions to local conditions forms part of implementation governance (Hill & Hupe, 2002). Structural, managerial, and contextual barriers are also associated with the extent of implementation gaps under different program conditions (Muchlis et al., 2025).

Local food utilization demonstrates the relationship between program services and the food environment. Utilization of regional food potential supports diversification based on local resources (Rahmanto et al., 2021). Consumption is also influenced by accessibility, affordability, preferences, and food appeal (Turner et al., 2018). DNBSF implementation in East Kalimantan operates under economic, sociocultural, and infrastructural conditions that influence access to local foods (Amelia et al., 2024). The Head of the Food Consumption and Safety Division at the East Kalimantan Provincial Food, Food Crops, and Horticulture Office explained that:

“The availability of local foods requires intensive public outreach to improve understanding of diverse carbohydrate sources. Public acceptance of local foods also requires preparation and presentation methods that correspond to community needs.” (Interview, April 15, 2026).

This explanation is consistent with the relationships among environment, culture, income, knowledge, family characteristics, and preferences for rice in shaping consumption patterns (Ariani et al., 2018; Rozi et al., 2023; Heryadi et al., 2024). At the service-delivery level in Mahakam Ulu, home-garden support provides household food resources through Women Farmers Groups (WFGs) or farmer groups that include families at risk of stunting. Target groups and environmental conditions constitute parts of the implementation process (Indarto, 2020). Access to assistance indicates receipt of a program intervention, whereas

actual consumption conditions describe household consumption behavior, as discussed by [Febriani et al. \(2025\)](#). A Junior Food Security Analyst at the Mahakam Ulu Regency Food Security and Agriculture Office explained that:

“Home-garden assistance was prioritized for families at risk of stunting through WFGs or farmer groups. Vegetable seeds were intended to be planted around recipients’ homes so that monitoring and household utilization could be conducted directly.” (Interview, June 17, 2026).

Table 4. Supporting Conditions for DNBSF Service Reach in Mahakam Ulu Regency

Dimension	Research Findings
Access and distribution	Territorial access varies according to river, road, and seasonal conditions; TCS, changes in transport modes, and storage facilities are used as distribution responses
Resources and coverage	Budget constraints concentrate implementation on priority activities and outreach in selected villages
Technology	Online meetings, websites, and social media are used for communication, coordination, and outreach
Timing and adjustment	Distribution schedules and transport modes vary according to seasonal conditions; implementers adjust transport modes and communication channels
Local food utilization	Local food utilization is associated with access, habits, preferences, and food preparation skills

Source: Interviews and research documents, processed by the authors, 2026.

The level of support differs across service dimensions. Technology and operational adjustments support communication and coordination. Budgets, personnel, activity coverage, territorial access, and local food utilization determine service reach. Geographical and logistical conditions are external factors, while budgets, personnel, activity priorities, and service mechanisms are directly associated with program coverage. Procedural capacity indicates the availability of administrative components, whereas operational capacity indicates the adequacy of resources and mechanisms required to reach target groups. The relationships among environment, time, resources, and interdependence among implementation actions can be explained through [Pressman and Wildavsky \(1984\)](#), [Hogwood and Gunn \(1985\)](#), and [Hill and Hupe \(2002\)](#). The distinction between procedural capacity and service reach provides the basis for analyzing activity outputs and outcome evidence.

C. Activity Outputs and Outcome Evidence in the DNBSF Program

DNBSF activity outputs can be identified through documented activities and forms of intervention. The 2025 Mahulu Food Festival included local food promotion, DNBSF education, food product innovation, and participation by government institutions, micro, small, and medium-sized enterprises (MSMEs), farmers, business actors, educational institutions, and communities ([PPID, 2025](#)). Other outputs include outreach, seed and home-garden assistance, information

delivery, supervision, and reporting. These outputs demonstrate that program activities were implemented. Message reception, the use of support, changes in knowledge, changes in practices, and benefits among target groups constitute outcome levels that require information on recipients and post-intervention developments. This distinction is consistent with [Hidayat et al. \(2025\)](#), who distinguish assistance transfers, capacity development, and substantive program effectiveness.

Administrative traceability is supported by technical guidelines, documentary requirements, activity reports, implementer identification, and available recipient data. A Junior Food Security Analyst at the East Kalimantan Provincial Food, Food Crops, and Horticulture Office explained that:

“Supervision was conducted through implementation guidelines and documentary requirements that assistance recipients and activity implementers were required to fulfill.” (Interview, June 22, 2026).

This information documents administrative implementation. Outcome evidence requires data on the use of assistance, recipient development, and follow-up after intervention. [Rahimah et al. \(2025\)](#) identify different levels of implementation across planning, organizing, implementation, communication, and the monitoring of activities and results. [Hidayat et al. \(2025\)](#) likewise distinguish assistance delivery from substantive achievement, while [Hill and Hupe \(2002\)](#) explain the relationship between operational information and organizational management within implementation systems.

Communication also needs to be analyzed according to its outcome level. Message delivery constitutes a communication output. Reception, comprehension, increased knowledge, and application constitute outcomes at the target-group level. [Asmoro et al. \(2021\)](#) show that changes in understanding following the introduction of local foods can be measured by comparing knowledge before and after an activity. [Suhaila et al. \(2024\)](#) similarly distinguish increased knowledge and awareness following DNBSF promotion from actual application, which requires subsequent observation. [Turner et al. \(2020\)](#) emphasize the importance of alignment among concepts, indicators, exposure, and outcomes so that each level of information is assessed according to its function. In Mahakam Ulu, the mechanism for communicating program messages extends from the provincial level to villages. A Junior Food Security Analyst at the Mahakam Ulu Regency Food Security and Agriculture Office explained that:

“Information received from the provincial government was communicated at the village level using simpler language while preserving the substantive meaning of the program.” (Interview, June 17, 2026).

Home-garden assistance comprises a sequence of interventions that can be traced from the initial stage. Target recipients, distribution channels, seed

provision, planting locations, and monitoring mechanisms can be identified from program implementation. Evidence of intermediate outcomes requires data on planting, successful cultivation, harvesting, utilization of produce, and household use of harvested produce. Access to DNBSF assistance and actual consumption patterns represent two different types of information (Febriani et al., 2025). Local food utilization is also influenced by household characteristics, income, knowledge, preferences for rice, and the availability of affordable and readily accessible substitute products (Rozi et al., 2023; Heryadi et al., 2024). The food environment encompasses availability, affordability, convenience, promotion, and individual factors within the relationship between available support and actual utilization (Turner et al., 2018; Downs et al., 2020).

Information on DNBSF implementation is most complete at the levels of activities, procedures, forms of intervention, and recipients recorded in administrative documents. Outcome evidence requires data on recipients, interventions, use of support, post-activity developments, and intermediate outcomes. Previous research shows that the completeness of such information is associated with continuity of post-activity monitoring (Rahimah et al., 2025), capacity development and monitoring of assistance (Hidayat et al., 2025), institutional support for target groups (Azizah et al., 2026), and documentation of benefits experienced by communities (Hariati et al., 2023). DDP describes dietary diversity at the aggregate regional level (Mayasari, 2023; Anggraini, 2026). Changes among DNBSF recipients require information linked to recipients and interventions. This distinction is consistent with studies of DDP implementation and variations in household consumption (Ariani et al., 2018; Indarto, 2020). Relationships among objectives, actions, resources, and outcomes are also important components of implementation (Pressman & Wildavsky, 1984; Hogwood & Gunn, 1985; Hill & Hupe, 2002). The distinction between activity outputs and the availability of data on intermediate outcomes establishes the basis for analyzing the outcome evidence gap.

D. Service Reach and Outcome Evidence Gaps in DNBSF Program Implementation

Analysis of administrative readiness, supporting conditions, service reach, activity outputs, and outcome evidence demonstrates different levels of attainment. Procedural capacity is identified through the policy basis, objectives, planning, role allocation, communication, resource organization, reporting, and control. Service reach depends on resource adequacy and operational conditions. Outcome evidence depends on the availability of information on recipients, interventions, follow-up, and intermediate outcomes. These differences are consistent with findings on imbalances between bureaucratic structures and resources (Indarto et al., 2024; Said et al., 2024), mismatches between resource potential and institutional

readiness resulting from institutional fragmentation (Asril et al., 2026), and variations in outcomes across groups according to institutional support (Azizah et al., 2026). Analysis of these relationships identifies two principal implementation gaps: the service reach gap and the outcome evidence gap.

The service reach gap represents the difference between available procedural capacity and adequate service delivery to target groups. Planning, communication channels, role allocation, and activity selection support program implementation. Budgets and personnel determine the scope of activities that can be implemented. The complexity of the service environment is associated with river conditions, roads, seasons, and food distribution. These factors occupy a different analytical position from internal program factors. TCS, changes in transport modes, and storage facilities constitute regional responses to distribution conditions. DNBSF activity coverage is more directly associated with budgets, personnel, activity priorities, and service mechanisms. Program reach is therefore determined by internal capacity and the operational environment. Implementation involving more organizations, decisions, and stages requires more complex coordination before services are received by target groups (Pressman & Wildavsky, 1984). Structural, managerial, and contextual barriers also increase mismatches between formal capacity and implementation (Muchlis et al., 2025).

Continuity of supervision, communication, and field assistance requires interorganizational support. Role allocation involves provincial and regency implementers, cross-sectoral government agencies, and local intermediaries. Its implementation requires personnel, information, and resources from other organizations. Changes in the function of agricultural extension workers affected local monitoring mechanisms. The Mahakam Ulu Regency Food Security and Agriculture Office subsequently used cross-sectoral collaboration with community nutrition volunteers to support supervision of home-garden assistance. This adjustment reflects the use of shared resources, as discussed by Alwi and Susanti (2023), the allocation of responsibilities and exchange of information to reduce fragmentation, as explained by Cejudo and Michel (2017), and the use of partner information in coordination, as described by Peters (2018). A Junior Food Security Analyst at the Mahakam Ulu Regency Food Security and Agriculture Office explained that:

“Changes in the function of agricultural extension workers increased the need for additional monitoring support. The office therefore collaborated with community nutrition volunteers from the Health Office to assist in supervising home-garden assistance for families at risk of stunting.” (Interview, June 17, 2026).

The outcome evidence gap represents the difference between implementation traceability and the availability of information on recipient development. Technical guidelines, documents, reports, outreach, home-garden assistance,

promotion, and recipient data provide information on program implementation. Outcome evidence requires data on specific recipients, forms of intervention, message reception or use of support, follow-up, and post-activity development. This distinction is consistent with differences between increased knowledge and application (Suhaila et al., 2024), implementation and outcome monitoring (Rahimah et al., 2025), assistance transfer and capacity development (Hidayat et al., 2025), and activity documentation and benefits experienced by communities (Hariati et al., 2023). In local food utilization, outcomes are also associated with the food environment and individual factors (Turner et al., 2018; Downs et al., 2020), economic, sociocultural, and infrastructural conditions (Amelia et al., 2024), and the distinct functions of food availability, affordability, and utilization (Putra & Rahmani, 2025). Outcome indicators must therefore be aligned with the type of intervention and the developments assessed at the target-group level (Turner et al., 2020).

Table 5. Analytical Matrix of DNBSF Program Implementation Gaps in Mahakam Ulu Regency

Implementation Basis	Comparative Dimension	Synthesized Finding	Analytical Position
Planning, funding, and activity options are available	Activity coverage and target villages	Implementation is concentrated on priority activities and outreach in selected villages	Service reach gap
Actors, role allocation, and supervision mechanisms are available	Monitoring personnel and cross-sectoral support	Home-garden supervision uses community nutrition volunteers following changes in field-monitoring support	Service reach gap
Communication channels from the provincial to village level are available	Relationship between messages and recipients	Message-delivery mechanisms are available; evidence of reception and comprehension requires recipient-level data	Service reach and outcome evidence gaps
Distribution adjustments are available at the regional level	River, road, and seasonal conditions	TCS and changes in transport modes constitute adjustments to distribution conditions	External conditions affecting service reach
Local food promotion and support are available	Access to food, preferences, habits, and preparation skills	Local food utilization is associated with household consumption conditions in addition to available program interventions	Outcome evidence gap
Supervision and activity records are available	Recipients, interventions, use of support, and intermediate outcomes	Administrative activity data are more complete than data on recipient development after intervention	Outcome evidence gap

Source: Interviews and research documents, processed by the authors, 2026.

The service reach gap represents the difference between procedural capacity and the adequacy of resources, activity coverage, monitoring personnel, and operational adjustments. The outcome evidence gap represents the difference between documented outputs and the availability of information on recipient

development. Both gaps are associated with cross-sectoral dependence because service delivery requires contributions from several organizations, while outcome evidence requires information exchange at each stage of intervention. This pattern is associated with institutional fragmentation and differences in levels of capacity, structure, communication, and resources (Indarto et al., 2024; Said et al., 2024; Asril et al., 2026; Azizah et al., 2026). In the frameworks of Pressman and Wildavsky (1984), Hogwood and Gunn (1985), and Hill and Hupe (2002), implementation is determined by relationships among objectives, resources, environment, organizations, actions, and outcomes. The analytical contribution of this study lies in conceptually distinguishing and examining the relationships among procedural capacity, service reach, and outcome evidence to explain DNBSF implementation gaps in Mahakam Ulu.

CONCLUSIONS AND SUGGESTIONS

Implementation of the DNBSF Program in Mahakam Ulu Regency demonstrates the availability of administrative readiness components as procedural capacity through the policy basis, operationalization of objectives into activities, planning, role allocation, resource organization, communication, reporting, and control. This capacity includes the provincial guidance function, regency-level implementation function, and cross-sectoral support. The level of supporting conditions differs across dimensions. Technology use and operational adjustments support communication and coordination. Budget adequacy, activity coverage, implementing personnel, territorial access, food distribution, and local food utilization determine service reach. Geographical and distribution conditions form part of the external environment, while budgets, personnel, activity priorities, and service mechanisms are directly associated with DNBSF Program coverage.

Activity outputs can be traced through food promotion and education, outreach, home-garden assistance, seed distribution, communication, supervision, and reporting. The most complete data are available at the levels of activities, procedures, forms of intervention, and administratively recorded recipients. Use of assistance, message reception and comprehension, and changes in consumption practices represent outcome levels that require data on recipient development after intervention. The relationship among the three analytical levels identifies two principal gaps. The service reach gap represents the difference between procedural capacity and the adequacy of service reach. The outcome evidence gap represents the difference between documented outputs and the availability of information on intermediate outcomes among recipients. The conceptual distinction and analysis of the relationships among procedural capacity, service reach, and outcome evidence constitute the study's analytical contribution to explaining DNBSF implementation in areas with complex service-delivery conditions.

Strengthening service reach requires systematic alignment among planning, budgeting, target identification, implementation, monitoring, and the use of monitoring results in subsequent planning. The East Kalimantan Provincial Government and Mahakam Ulu Regency Government need to align resource allocation with the coverage of target villages, territorial access conditions, personnel requirements, and forms of intervention. Cross-sectoral cooperation needs to establish clear functions for monitoring, field assistance, education, and local food support. Technology needs to support communication and coordination. Services requiring direct interaction require sufficient personnel, time, and field activities. Local food promotion also needs to be implemented together with food preparation education, improved access to food resources, home-garden utilization, and adjustments to household consumption characteristics.

Strengthening outcome evidence requires a recording system that covers recipients, types of intervention, implementation dates, follow-up, use of support, message reception, and intermediate outcomes. For home-garden assistance, records need to include seed distribution, cultivation progress, utilization of produce, and household use of harvested produce. For education and outreach, monitoring needs to cover changes in knowledge, comprehension, and application of DNBSF messages. This information provides a basis for improving subsequent planning. Future studies need to involve recipient households, WFGs, farmer groups, community volunteers, other target groups, and government officials at the regency and village levels. Observation across multiple implementation periods is also required to analyze changes in intermediate outcomes. The three-level analytical framework can also be tested in other areas with different institutional and territorial conditions.

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