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Competency-Based Agricultural Extension Model Design In Bone Bolango Regency

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Abstract

The agricultural sector plays a vital role in the Indonesian economy, including in Bone Bolango Regency, Gorontalo Province. Within the scope of Bone Bolango Regency, efforts to improve the competence of agricultural extension workers have been carried out through various training programs and workshops. However, evaluation of the effectiveness of these programs is still limited. This research aims to develop "Design of a competency-based agricultural extension model that is in accordance with the specific context and needs of Bone Bolango Regency". This study succeeded in identifying and validating 6 (six) core competency variables which were described into 26 behavioral indicators that were unanimously agreed upon (100% consensus) by a panel of experts (Academics, Bureaucracy, and Practitioners). Based on the results of the second round of the Delphi method, there is a universal consensus from all key informant groups that Extension Planning ranks first priority. The ability to design this work program is considered the most critical because it acts as an upstream that determines the direction, goals, accuracy of assistance interventions, and the effectiveness of changing farmers' behavior before going to the field. Instead, Monitoring and Assessment are consistently placed in last order.

Keywords: Counseling, Competence, Development.

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INTRODUCTION

The agricultural sector plays a vital role in the Indonesian economy, including in Bone Bolango Regency, Gorontalo Province. As one of the districts with great agricultural potential, Bone Bolango faces challenges in optimizing its agricultural productivity. Agricultural extension is key in efforts to increase farmer capacity and adopt modern agricultural technology. However, the effectiveness of agricultural extension is often questioned, especially in the context of meeting the specific needs of farmers and adapting to dynamic environmental changes (Anwarudin et al., 2020).

Agricultural extension in Indonesia has undergone various transformations since the colonial era until now. The extension approach has evolved from a top-down model that is instructive to a participatory model that involves farmers more in the learning and decision-making process (Sumardjo, 2019). Nonetheless, the implementation of an effective extension model is still a challenge, especially in areas with unique geographical and sociocultural characteristics such as Bone Bolango Regency.

Bone Bolango Regency, with an area of about 1,984.31 km², has a diverse topography, ranging from lowlands to mountains. This condition creates variations in the agricultural system and different extension needs (BPS Bone Bolango Regency, 2023). In addition, the ethnic and cultural diversity in the district also influences the patterns of social interaction and adoption of agricultural innovations, which in turn impacts the effectiveness of agricultural extension.

In the global context, the agricultural extension paradigm has shifted towards a more holistic and competency-based approach. This approach emphasizes on developing the capacity of extension workers and farmers comprehensively, including aspects of knowledge, skills, and attitudes (Sulaiman & Davis, 2012). The competency-based extension model is seen as more adaptive to environmental changes and able to meet the specific needs of farmers in the modern era.

In Indonesia, efforts to improve the competence of agricultural extension workers have been carried out through various training and certification programs. However, the implementation of the competency-based extension model still faces various obstacles, including limited resources, digital gaps, and resistance to change (Haryanto et al., 2017). In Bone Bolango Regency, these challenges are exacerbated by difficult geographical conditions and uneven infrastructure.

The effectiveness of agricultural extension is highly dependent on the suitability between the extension model with the characteristics of farmers and local conditions. Feder et al. (2011)

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emphasized that the "one size fits all" approach in agricultural extension is no longer relevant in dealing with the complexities of modern agriculture. Therefore, the design of agricultural extension models that are competency-based and adapted to the local context is very important.

In Bone Bolango Regency, the agricultural sector accounts for around 30% of the district's total GDP, with the main commodities including rice, corn, and horticulture (BPS Bone Bolango Regency, 2023). However, agricultural productivity in this district is still below the national average. Data from the Bone Bolango Regency Agriculture Office (2022) shows that the productivity of paddy fields in this district only reaches 4.5 tons/ha, while the national average reaches 5.1 tons/ha. This productivity gap indicates that there is room for improvement through more effective agricultural extension.

The implementation of Law Number 16 of 2006 concerning the Agriculture, Fisheries, and Forestry Extension System provides a legal basis for the development of a more structured and competency-based extension system. However, in practice, there is still a gap between policy and implementation on the ground. (Syahyuti et al. 2014) show that the institutional capacity of counseling at the district level still needs to be improved to be able to implement an effective and competency-based extension system.

Within the scope of Bone Bolango Regency, efforts to improve the competence of agricultural extension workers have been carried out through various training programs and workshops. However, evaluation of the effectiveness of these programs is still limited. The Performance Report of the Agriculture Office of Bone Bolango Regency (2022) shows that only 60% of agricultural extension workers in this district have participated in competency-based training in the last three years. This shows the need to develop a more systematic and competency-based extension model.

Agricultural technology has undergone significant evolution in recent decades, changing the way humans farm and manage agricultural resources. These developments not only increase agricultural productivity but also create more sustainable and efficient farming systems (Smith, J., & Johnson, 2023). However, the adoption of this technology in Bone Bolango Regency is still limited. A survey conducted by the Gorontalo Agricultural Technology Assessment Center (BPTP) (2021) shows that only 35% of farmers in Bone Bolango Regency have regular access to agricultural information through digital platforms. Another challenge in developing an agricultural extension model in Bone Bolango Regency is the diversity of agroecosystems and farming systems. This district has a diverse agricultural area, ranging from technical irrigated rice fields to dry land in hilly areas. This diversity demands a flexible extension approach that is able to accommodate the

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specific needs of farmers in various agroecosystems (Sumardjo & Mulyandari, 2011).

Socio-cultural aspects also play an important role in the effectiveness of agricultural extension. Bone Bolango Regency has a multiethnic society, with the dominance of the Gorontalo tribe and the presence of immigrant tribes such as the Bugis and Javanese. Research by Anwarudin & Haryanto (2018) shows that socio-cultural factors, including local norms and traditional communication patterns, influence farmers' acceptance of agricultural innovation. Therefore, the design of the agricultural extension model needs to consider socio-cultural aspects to increase its effectiveness.

Sustainability and adaptation to climate change are also important focuses in contemporary agricultural extension. Bone Bolango Regency, like many other regions in Indonesia, faces the threat of climate change that impacts agricultural productivity. The report of the Regional Disaster Management Agency (BPBD) of Bone Bolango Regency (2022) noted an increase in the frequency of drought and flood events that affect the agricultural sector. In this context, agricultural extension needs to include aspects of climate change mitigation and adaptation as an integral part of the competencies developed.

The development of a competency-based agricultural extension model also needs to consider gender and social inclusion aspects. Although women play an important role in agriculture in Bone Bolango District, their participation in extension programs is still limited. Data from the Bone Bolango Regency Women's Empowerment and Child Protection Office (2022) shows that only 30% of agricultural extension program participants are women. This shows the need for a more inclusive approach in the design and implementation of the extension model.

Another challenge in developing a competency-based agricultural extension model is the limited budget and human resources. The agricultural extension budget in Bone Bolango Regency only reaches 2% of the total district development budget (Bone Bolango Regency Budget, 2023). In addition, the ratio of agricultural extension workers to the number of farmers is still far from ideal, with one extension worker having to serve an average of 500 farmers, well above the national standard of 1:150 (Agriculture Office of Bone Bolango Regency, 2022).

In the context of national policy, the 2015-2045 Agricultural Development Master Strategy issued by the Ministry of Agriculture emphasizes the importance of strengthening the agricultural extension system as one of the main pillars of sustainable agricultural development. This strategy includes developing the capacity of extension workers, strengthening extension institutions, and utilizing information technology in extension (Ministry of Agriculture, 2015). However, the implementation of this strategy at the district level, including in Bone Bolango, still faces various

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obstacles.

Based on the complexity of the challenges and opportunities faced in the development of agricultural extension in Bone Bolango Regency, a comprehensive and evidence-based approach is needed in designing a competency-based agricultural extension model. This model must be able to integrate the technical aspects of agriculture, socio-culture, economics, and the environment, as well as take advantage of the potential of information and communication technology.

RESEARCH METHODS

This study was conducted in the Bone Watershed (Watershed), Bone Bolango Regency. The duration of the study is 4 months from February-May 2026. The selection of the research location was deliberately given the potential for good agricultural development in the Bone Bolango Regency area. This type of research is a survey research using a quantitative approach combined with a qualitative approach to further explore the data needed. It is better known as the combination research method.

According to Tashakkori and Creswell in Donna M. Martens (2010), providing a definition of mixed methods is research, where researchers collect and analyze data, integrate findings, and draw conclusions inferentially by using two quantitative and qualitative research approaches or methods in one study.

Sugiyono (2015) stated that this research method (mixed) combines or combines quantitative research methods and qualitative methods to be used together in a research activity, so that more comprehensive, valid, reliable, and objective data is obtained. Population describes a very large and extensive amount of data in the study (Darmawan, 2016), where population is also a collection of all possible people, objects, and other metrics that are of concern in the study (Suharyadi and Purwanto S.K., 2016). Therefore, this researcher took several related stakeholders (Government, Academics, and Practitioners) who have work experience in the last 5 years. The technique used in determining informants is purposive where the researcher chooses certain people who are considered to have knowledge and information to be interviewed about the problem to be researched, namely the Competence-Based Agricultural Extension Village in Bone Bolango district**.** The method used in this study is mixed methods, data collection is carried out comprehensively, meaning complete data which is a combination of quantitative and qualitative data. In addition, the data collected is also valid data as much as possible, namely data that has a high degree of accuracy between the data that actually occurs and the data that can be reported by the researcher. With the combination

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method, the data obtained from this study will be more valid because the truth of the data cannot be validated by quantitative methods will be validated by qualitative methods or vice versa.

In this study, the author is more inclined to use the integrating method, meaning that quantitative and qualitative data are collected congruently and combined with the database of the two by transforming the qualitative themes into quantifiable numbers and comparing the results of this calculation with descriptive quantitative data. Meanwhile, the weight or portion of the two data is not divided firmly. The researcher prefers to divide the portion of data more flexibly, meaning that quantitative data may be explored more in this study or vice versa. The need for data used to clarify concepts is collected based on needs. The Delphi technique is a way or method to organize ideas among experts in order to improve the condition of institutions in the future (Weaver, 1971:267). According to Lewis, the Delphi Technique is interpreted as a process to gather opinions among experts about social phenomena that will affect the institutional situation (Lewis, 1984:89). Meanwhile, Witkins (1984) defines the delphi technique as a way to determine consensus among experts regarding the goals and urgent needs of an institution. From these three definitions, the Delphi Technique can be interpreted as a systematic way to obtain consensus among experts who have interests and are relevant to decision-making, to determine organizational goals, to determine the priorities of activities. program, and determine the program plan of an institution in the future. Therefore, the Delphi Technique is a systematic way to obtain consensus among people with relevant interests, through a panel discussion, to determine a program plan.

DISCUSSION

Bone Bolango Regency is located in Gorontalo Province, Sulawesi Island, and has an area of about 1,984 km². This region is located at a coordinate position between 0°21' – 0°54' North Latitude and 122°57' – 123°32' East Longitude. This regency is directly adjacent to Gorontalo City and Gorontalo Regency to the west and north, North Gorontalo Regency to the northeast, and Tomini Bay which is part of the Maluku Sea to the south.

Characteristics of Informants

This study uses informants as the source of data. Research informants are research subjects from whom research data can be obtained, have extensive and in-depth knowledge about research problems so as to provide useful information. Informants also function as feedback givers to

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research data. (Burhan Bungin, 2010). In this study, the informants selected were the actors who were directly related, namely Academics, Bureaucracy and Practitioners.

Table 1. Characteristics of Informants

In the study involving 6 (six) informants who were deliberately selected (*Purposive*) to

Informants	Age (Years)	Education Level	Jobs	Length of Service (Years)
A1	54	S3	Academics	20
A2	54	S3	Academics	25
B1	51	S1	Head of Agricultural Extension Division Bone Bolango	23
B2	49	S1	Head of the Department of Food Security and Agriculture	23
P1	59	High School	Practitioner (KTNA)	23
P2	53	High School	Practitioner (KTNA)	15

provide a comprehensive perspective on the object of the research. The informants were classified into three main groups, namely the Academics group consisting of two lecturers (A1 and A2), the Bureaucratic group consisting of structural officials in agricultural agencies (B1 and B2), and the Practitioner group represented by members of the Mainstay Fishermen Farmers Contact (P1 and P2). This diversity of backgrounds aims to capture valid data from various perspectives of stakeholders in the agricultural sector.

Respondent Characteristics

Characteristics of extension workers are characteristics that are possessed by individuals throughout their lives, characteristics are important factors for the individual that can affect success in learning or work which includes cognitive factors and other characteristics that are possessed and are the differentiators between agricultural extension workers themselves, these characteristics are Age, Education Level and Length of Work.

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Table 2. Bone Bolango Regency Extension Officer Data

Yes	Age Group	Respondents	Percentage (%)
1	25-44	18	60
2	45-59	12	40
Total		30	100
Average	40		

The characteristics of respondents in the age category are in the productive age category with no respondents who are over 60 years old. This shows that agricultural extension workers in Bone Bolango Regency are still in productive age, namely that agricultural extension workers are experts in carrying out their duties and functions as extension workers well.

Delphi Stages

The Delphi method is a structured communication technique that was originally developed as an interactive systematic forecasting method by relying on a panel of experts or key informants. This method stage begins with the identification and selection of a panel of experts who have competence, in-depth knowledge, and direct relevance to the topic or problem being researched.

Extension Competency Variables (Stage 1)

The Extension Competency Variable refers to a set of abilities, knowledge, skills, and work attitudes that an extension worker must possess in order to carry out his duties professionally and effectively. This variable measures the extent to which extension workers master technical materials, operate ICT devices to support their duties, and implement persuasive communication strategies so that people want to change their behavior. In addition, this competency also includes managerial aspects, ranging from proficiency in planning programs that are in accordance with real needs in the field, executing counseling activities creatively, to monitoring and evaluating to measure the success and impact of the programs that have been implemented.

Based on the results of data analysis, the competency variables in this study were compiled through the integration of literature studies and field validation results. The literature study refers to a study titled "Factors Affecting the Competence Level of Agricultural Extension Agents: A Comprehensive Analysis of Core Competencies in Northwestern Ethiopia" by Aregaw et al., which identified six main pillars of competence. The six variables include counseling planning, implementation, monitoring and evaluation, extension communication, teaching materials, and

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the integration of Information and Communication Technology (ICT). This identification is a theoretical basis in mapping relevant competency standards to be developed in the agricultural extension model.

Priority Order of Expert Opinion (Stage 2)

The determination of the priority order of indicators and the convergence of expert opinions are two interrelated concepts in the group-based decision-making process. Determining the order of priority of indicators is a systematic process of sorting and determining the level of relative importance of various indicators in a study or evaluation, with the aim of identifying which indicators are most critical and influential towards a particular goal, so that resources and attention can be allocated appropriately and efficiently.

This process is generally carried out using a structured method of direct ranking techniques involving experts in the relevant field. In practice, experts are asked to make assessments repeatedly through several rounds until their views gradually lead to a consistent agreement, known as the convergence of expert opinions. This convergence is measured through monitoring the degree of variation or the spread of the answer between rounds, for example by calculating the coefficient of variation or the narrowing interquartile range, as is commonly applied in the Delphi method. If convergence has been achieved, the resulting order of priorities is considered valid, representative, and scientifically accountable because it reflects the consensus from various relevant expertise perspectives.

Agricultural Extension Worker Competency Indicators (Stage 3)

The extension competency model built in this study summarizes various important skills that must be possessed by a modern agricultural extension worker. Each indicator included in this list has gone through a rigorous screening process, where the initial draft of the theory is reconfirmed and sharpened by experts to really suit the field conditions in Bone Bolango Regency. Based on table 4. show the results of the assessment of counseling competencies which include six main variables, namely Counseling Planning, Implementation, Monitoring and Assessment, Extension Communication, Teaching Materials, and Information and Communication Technology (ICT), all indicators totaling 26 indicators show positive results with the fulfillment of all assessment items.

Entering the third round of the Delphi method, the research focus is directed to testing

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and stabilizing the behavioral indicators that make up each variable of extension worker competence. The results of the analysis in Phase III show that an absolute consensus has been reached, where all expert panels (Academics, Bureaucrats, and Practitioners) give an assessment of approval or a "Yes" answer of 100% to all indicators submitted without any rejection. This unanimous agreement indicates that these indicators are considered very representative, applicable, and meet the standards of real needs to measure the competence of agricultural extension workers in Bone Bolango Regency. Although all experts are on the same page, each group of experts has a strong argumentative basis and personal point of view in assessing the urgency of each indicator.

CONCLUSION

Based on the results of research and discussion of the Competency-Based Agricultural Extension Model in Bone Bolango Regency, the following conclusions can be drawn:

1. The competencies needed by agricultural extension workers in Bone Bolango Regency in facing agricultural challenges, with the results of identification and validation of 6 main competencies unanimously agreed upon by a panel of experts from academia, bureaucracy, and practitioners, covering a total of 26 behavioral indicators. The six competencies include the ability to plan extension ranging from analyzing farmers' needs to preparing work plans, mastery of agricultural technical materials that can be delivered simply and easily understood by farmers, and the ability to communicate dialogically and humanistically in the field. In addition, agricultural extension workers in Bone Bolango Regency are also required to be digitally literate to access and disseminate agricultural information accurately, be able to work together in teams, facilitate training, and manage conflicts in the field, and have the ability to evaluate programs and prepare performance reports formally. These six competencies are seen as crucial as professional standards that must be possessed by every agricultural extension worker in Bone Bolango Regency in carrying out their duties effectively to answer various increasingly complex agricultural challenges in the region.
2. The most prioritized competency for agricultural extension workers in Bone Bolango Regency is measured using the Likert scale, the results of which show a fairly interesting pattern between practical ability and conceptual understanding. In extension planning competencies, practical indicators such as the preparation of work plans that can be implemented achieved the highest score with a TCR of 85% in the category of Excellent, but the conceptual understanding of the purpose of the agricultural extension system was actually in the lowest

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position with a TCR of 55% in the category of Sufficient. Meanwhile, in the competence of material mastery, agricultural extension workers in Bone Bolango Regency showed excellence in terms of technical mastery of commodity cultivation with a TCR of 80% in the Good category, but still had weaknesses in translating complicated scientific language into simple instructions that were easy for farmers with a TCR of 51% in the category of Sufficient. These findings indicate that practical competencies are prioritized and mastered more by extension workers, while conceptual understanding and adaptive scientific communication skills still need further strengthening as part of the professional development of agricultural extension workers in Bone Bolango Regency.

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